Breast Cancer in 2016: where to from here?

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Over the last decade, several incremental advances have been made in systemic therapy of metastatic breast cancer. Novel endocrine agents, anti-HER2 therapies, targeted therapies, and even cytotoxics have entered routine clinical practice over this time, each offering a different degree of clinical benefit. Standing upon this foundation, we are now facing waves of new information pertaining to tumor immunology and genomics. In this presentation, I will discuss how these new insights might be integrated into our existing knowledge to develop more successful therapeutic strategies.

Surgical advances in breast cancer

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The study of the biology of breast cancer, and an understanding of the diversity of disease, and the differential impact of care based on tumor type is foundational for the training of surgeons specializing in the care of breast cancer patients. The biology of the tumor determines the options for care as well as the type of treatment and the order of therapy. Surgeons can play a critical role in advancing more tailored care- including participation in trials that test new therapies and those that test less therapy when it is warranted. As well, as the science of risk evolves, we have to incorporate tumor biology, host risk, and response to therapy to better tailor screening and surgical treatment. There are several areas of advancement that help to minimize the impact of surgery. One is to continue to refine the extent of lymph node surgery even in a patient with positive nodes at diagnosis, after neoadjuvant therapy by localizing both the sentinel node and the positive node at diagnosis. However, standards for the management of the axilla in the neoadjuvant setting are essential because the information is a critical component of residual cancer burden. The fastest way to improve outcomes for women at the highest risk of recurrence is to participate in neoadjuvant trials where the early endpoint in complete pathologic response. So leadership is setting the surgical standards for evaluating extent of residual disease is essential. Surgeons likewise need to play a leadership role in de-escalating care for those with minimal risk. The spectrum of breast cancer ranges from indolent to extremely aggressive. Screening increases the likelihood that indolent lesions will be detected. The key to preventing harm is to understand biology at the time of diagnosis. Tools to determine ultra-low risk have been developed, allowing a much more minimal approach to care. Using these tools as well as other criteria to adopt the level 1 evidence for the omission of radiation will improve health care value and quality of life. For DCIS, a condition identified primarily by screening, the challenge is to develop the evidence base for intervention. Eliminating the urgency for intervention and allowing time to determine the need for intervention is a strategy that will safely allow us to learn more about the natural history of this condition and prevent overtreatment. We also need to work with our radiology colleagues to better understand what should truly be a target for screening. Technical advances have also decreased the adverse impact of surgical interventions. These include cosmetic approaches to partial mastectomy, mastectomy, and reconstruction, including total skin sparing mastectomy, fat grafting, oncoplastic reductions as a tool for primary resection. New is a good time to think about the future of how we train breast surgeons and whether surgical training should evolve to make that the requisite skills reside in one surgeon rather than requiring two to optimize a cosmetic outcome.

Critical decision making in Radiation Therapy for breast cancer

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The EBCTCG meta-analysis in 2005 demonstrated for the first time that radiation therapy (RT) after breast-conserving surgery or mastectomy not only reduced local-regional recurrence but also improved long-term survival. For every 4 local recurrences avoided at 5 years, one breast cancer death was avoided at 15 years. In the updated analysis in 2011, the EBCTCG adopted 'any first recurrence' as the primary endpoint for the effect of RT primarily due to its established systemic effect in reducing both local and distant recurrence. One breast cancer death was avoided by year 15 for every four recurrences avoided by year 10. Early detection enabled by population-based mammographic screening and advances in multidisciplinary breast cancer management underpin the falling local recurrence rates over the last few decades and hence, the significance of tailoring RT utilisation according to the local recurrence risks of individual patients to reduce over-treatment of low-risk patients. The recent development of breast cancer classification based on gene expression profiles has shown that each intrinsic subtype is associated with distinct clinical outcomes, and luminal-A subtype is shown in early studies to be associated with the lowest local recurrence rate compared to the other subtypes. Clinical trials are in progress to improve the prognostic precision for local recurrence to identify patients with low risk of local recurrence who may safely omit RT. The other advances in RT after conservative surgery include (1) hypofractionated whole breast RT after conservative surgery is at least equal to conventional fractionation in safety and efficacy; and (2) partial breast RT achieves acceptably low local recurrence rate in selected patients. Thus, the current key research direction for RT in breast conserving therapy lies in optimising personalised RT in terms of its utilisation, dose fractionation and radiation target volume. The paradigm shift from axillary dissection to sentinel node biopsy and results of multiple recently reported randomised trials have brought focus to the role of regional nodal RT in patients with node-positive early breast cancer. This is an area of significant controversies and active research to identify patients who would benefit from regional RT, including internal mammary nodal irradiation.
Global issues in breast cancer survivorship

Deborah Fenlon

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It is clear that people who have completed treatment for breast cancer are left with multiple needs. It has been shown that cancer survivors have similar health to people with other long-term conditions and cancer survivorship is increasingly being seen as a chronic illness. However, it is also clear that the burden on oncology services to continue long-term follow up is unsustainable. Traditional models of follow up have focussed on early detection of recurrence, but have failed to improve survival rates. A number of reports on cancer survivorship have also shown that many people who have completed treatment for cancer feel that they are abandoned despite many unmet health needs.

The response to this to date has been to attempt to improve communication with the patient and between health care providers. The development of survivorship care plans provides a useful summary of treatment and potential late effects to guide medical care. However, even in the UK where there are clear lines of communication between primary and secondary health care practitioners these are not always utilised, and evidence from Grunfeld et al shows that these may not be beneficial for improving patient reported outcomes.

Work with patients to explore what they feel they need at the end of treatment has identified that they want more help to increase their damaged sense of confidence and ability to self-manage the problems they are left with. There is therefore a growing body of work to explore how this might best be supported. There is an increasing onus on cancer survivors to take up healthy lifestyles and adhere to long-term adjuvant therapies, but if we have failed to address the fundamental disruption to their sense of self and supported them to restore lost confidence then they may be unable to engage with the requirement to effectively self-manage these complex issues. This presentation will share some of the UK experience research and practice in addressing survivorship needs of people with breast cancer.

Advances in the Management of HER2-Positive Breast Cancer

Shom Goel

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The range of systemic therapy options for patients with HER2-positive breast cancer has expanded dramatically since the introduction of trastuzumab in the late 1990’s. Physicians are now faced with a broad range of therapeutic options, and a key challenge is determining which agent(s) to use in any given clinical situation. In this presentation, I will review clinical trial data and hence suggest “gold standards” for the management of HER2-positive breast cancer. I will also discuss scenarios in which deviation from these guidelines might be appropriate.

Challenges with the Implementation into Clinical Practice of Subcutaneous Trastuzumab – A Pharmacist’s Perspective

Geeta Sandhu

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Subcutaneous trastuzumab has recently become available nationally on the Pharmaceutical Benefits Scheme for locally advanced and metastatic HER2-positive breast cancer. Its unique formulation with recombinant human hyaluronidase temporarily interrupts the extracellular matrix integrity of the body’s subcutaneous tissue, enabling painless and straightforward drug delivery. Studies suggest that the 600mg fixed dose 3-weekly, no requirement for intravenous access or loading doses, provides a convenient and timesaving alternative from the traditional weight based dosing of intravenous trastuzumab for patients and busy cancer day units alike. However, does this actually translate into a reduction in drug preparation time, patient chair time and drug wastage for the ‘real life’ Australian clinical setting? Clinical trials have demonstrated comparable pharmacokinetics, efficacy and tolerability between subcutaneous and intravenous trastuzumab. Does the one dose fit all approach with subcutaneous administration ensure long-term disease free survival rates and an adverse effect profile similar to that of intravenous trastuzumab at the extremes of population i.e. in obese or underweight patients?

Nursing Care of the Breast Cancer Patient with Targeted Therapy-Related Side Effects

Jenny Gilchrist

1. Macquarie University Hospital, Sydney

The past five years has seen an emergence of targeted therapies as a mainstay of breast cancer treatment. Accompanying these novel agents are treatment toxicities which are often different in etiology and pathogenesis to toxicities previously experienced with cytotoxic agents. Management of
these new classes of side effects is often complex and requires close supervision of the patient by the oncology team. With the incidence of cancer rising, the ability of medical oncologists to manage these patients independently in the outpatient setting is becoming increasingly difficult. Specialist nurses can be educated and trained to manage these patients autonomously and effectively as a part of the medical oncology team.

Overview of current therapeutic trials in Australia

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Much has been learned from clinical trials conducted in what we might call the pre-subtype era. We know that systemic therapies given in the adjuvant setting improve survival, that anthracyclines and taxanes are the best cytotoxics to use, that endocrine therapy is effective, especially when given for many years, and that aromatase inhibitors are slightly better at preventing relapses than tamoxifen. However we have now entered an era where clinical trials have to be designed with the likely breast cancer subtype in mind. This makes trials more exciting and interesting to do, but also more complicated and expensive. Several of these trials will be reviewed, encompassing ER positive disease, HER2 positive disease and immunotherapy, and the adjuvant use of PARP inhibitors in women with BRCA mutations.

Surgical Aspects of Brain Metastases and Avoiding Complications

Sarah Olson
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Metastatic brain cancer arises in 10-40% of patients with cancer. Patchells landmark trial strongly supported excision of a solitary metastases. Further studies have supported up to four metastases being surgically removed. Reoperation also significantly increased survival times. En bloc resection rather than piecemeal is preferable as it has been shown to reduce the risk of leptomeningeal disease.

Surgical mortality should be less than 2% and morbidity under 6 %. Mortality and morbidity have been improved by computer navigation and brain mapping with fMRI and tractography. Surgically awake craniotomies, fluroscein, neuroendoports and direct cortical stimulation can help reduce morbidity and aid maximal resection. They all have limitations that will be discussed. Laser interstitial tumour ablation is an exciting new surgical technology showing promise for metastases in eloquent locations. It is not currently yet available in Australia.

There have been no prospective randomised trials comparing SRS and surgery but each method would appear particularly suited to different situations and outcome similar. Surgery can provide histological diagnosis, avoid long term steroid use, result in immediate improvement of mass effect and provides tissue samples for scientific purposes. It may be necessary if the primary disease is unknown. It is ideal for large tumour over 3cm in patients with limited comorbidities, good performance status and good systemic control. Minimally invasive brain cancer removal means patients can be discharged the following day.

53% of metastatic tumours have clinically relevant genetic alterations from the primary cancer and the importance of brain cancer metastatic tissue may in future have significant practical implications as we look more to molecular pathways.

Changing paradigms in the management of brain metastases

Matthew Foote
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Brain metastases occur in 20-40% of patients with advanced disease and this may increase with growing utilisation of imaging in asymptomatic patients and the emergence of increasingly effective systemic therapies. Prognosis varies according to age, performance status, number/volume of brain metastases and extent of extracranial disease. In select better-prognosis patients, local therapy in the form of surgery or stereotactic radiosurgery (SRS) improves outcomes compared to whole brain radiotherapy alone. Given the heterogeneity of patients with brain metastases, treatment needs to be individualised. The complexities of managing these patients will be discussed particularly in the current environment of multiple local and systemic treatment options.
Management of brain metastases has come a long way from even as short as five years ago. Improvements in neurosurgical techniques, advances in radiosurgery and also in systemic treatments mean that patients with brain metastases are surviving longer. However, this also means that these patients may also have to live longer with long-term complications of their treatments, such as hydrocephalus (depending on location of metastases and resection) and cognitive impairment from brain irradiation. In this talk, I will cover some of these complications, as well as some of the systemic treatments that are used in this setting.

However, there is no denying that overall this patient population have poorer prognoses and heavier symptom burden. Loss of independence and autonomy, whenever it may occur in their disease trajectory, is a terrible blow to every patient in this situation. The gradual loss of a patient’s mental capacity and personality as his or her disease progresses inevitably causes much grief and suffering to his or her family and friends. In this talk, I will present a couple of case studies and talk about how to manage symptoms that may be seen in patients specifically with brain metastases.

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**Targeting HER receptors in Brain Metastases**

Sunil R Lakhan

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The development of brain metastases (BM) is associated with significant morbidity and virtually 100% mortality. BM develop in 10–16% breast cancer patients, with highest incidence for HER2-positive and triple-negative disease. Median survival is 5–22 months depending on treatment and prognostic indicators. There are no standard targeted drug therapies available for BM.

We have demonstrated that HER3 (ERBB3) tyrosine kinase is over-expressed in BM compared to matching primary breast and lung cancers, suggesting it may be activated to exploit the abundance of neuregulin (NRG) ligand in the brain. In support of this, we detected very low expression of NRG in clinical samples by RNAseq, and could suppress the growth of intracranial MDA-MB-231 breast cancer xenografts by co-grafting a neutralizing Nrg1 antibody, or treating the mice with Herceptin (i.p.). ERBB3 RNA levels correlate strongly with ERBB2 in clinical samples, but at the protein level HER3 is ubiquitously activated (phosphorylated) in cases comprising a range of HER2 activation levels. IHC analysis of a large archival BM cohort (n=170; 7 primary cancer types) showed strong, complete pHER3 membrane staining in 57.7% cases. Collectively these data suggest that targeting HER3 may be a good therapeutic strategy.

We are currently embarking on a pilot clinical biomaging study of BM from HER2+ breast cancer, using a PET/Pertuzumab conjugate. We plan to assess the feasibility of this theranostic approach for the management of patients with brain metastases.

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**Exercise in the Management of Arthralgia**

Melinda Irwin

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Guidelines recommend that postmenopausal women with hormone-receptor positive breast cancer receive an aromatase inhibitor (AI) as part of their breast cancer treatment. However, side effects often result in poor AI adherence, with up to 50% of patients not taking AIs as prescribed, and discontinuation rates of 20% within the first year of use. Both non-adherence and early discontinuation of AIs have been shown to be independent predictors of mortality. Arthralgia, defined as pain or stiffness in the joints, is the most common reason for poor AI adherence and drug discontinuation, and is reported in up to 50% of breast cancer patients within six months of initiating AI therapy. There are few data regarding effective treatment of AI-induced arthralgias. Exercise may improve AI-induced arthralgias as it has been shown to be beneficial for osteoarthritis. Exercise may also have beneficial effects on disease-free survival and quality of life, which is also adversely affected by AI therapy. We conducted, in 121 breast cancer survivors taking AIs and reporting arthralgias, a yearlong randomized trial of exercise vs. usual care on arthralgia severity, entitled the Hormones and Physical Exercise (HOPE) Study. Results from the HOPE Study and other exercise and arthralgia studies will be discussed, as well as future research and clinical and community-based exercise opportunities in the management of arthralgia.

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**Exercise for the management of upper-body morbidity**

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Upper-body morbidity associated with treatment for breast cancer is typically characterized by the presence of symptoms, such as pain, weakness and tightness, as well alterations in the use and function of the upper-body. Arguably, lymphedema (swelling) is regarded as the most feared and problematic upper-body concern post-breast cancer. Upper-body morbidity during and following treatment for breast cancer is common, with between 10–64% of women reporting specific upper-body symptoms, and approximately 20% of women developing lymphedema post-breast cancer. Upper-body morbidity remains common into longer-term survivorship, and although lymphedema may be transient for some, those who present with mild lymphedema are at increased risk of developing moderate to severe lymphedema. Epidemiological evidence suggests a relationship between physical activity levels and upper-body morbidity with those engaging in 150+ minutes of physical activity each week being less likely to report upper-body concerns, compared with those who are insufficiently active or sedentary. Further, severity of upper-body morbidity is less for those engaging in sufficient levels of weekly physical activity. There is also a consistent body of intervention evidence demonstrating that progressive, supervised exercise during and following breast cancer treatment can prevent and/or attenuate upper-body morbidity, including lymphedema. As such, promoting national physical activity guidelines and encouraging participation in appropriately-prescribed exercise during and beyond treatment for breast cancer is important for the prevention and management of upper-body morbidity.
Patterns of care for ductal carcinoma in situ of the breast in Queensland over a decade (2003-2012)  
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5. Queensland Health, South Brisbane, QUEENSLAND, Australia  
Aims: This study aimed to examine the patterns of care for ductal carcinoma in situ (DCIS) in Queensland, with particular reference to breast conserving surgery and the use of adjuvant radiation therapy (RT) and the clinicopathological factors which influenced the use of RT over a ten year period. The incidence of invasive breast cancer recurrence and factors predictive of invasive recurrence were also examined.
Methods: A retrospective review of the Queensland Oncology Repository (QOR) was undertaken to identify women diagnosed with DCIS (TisN0) and treated with BCS with or without adjuvant RT between 2003-2012. Invasive breast cancer recurrence was defined as any subsequent invasive cancer in the ipsilateral breast more than six months after the initial diagnosis and treatment of DCIS. Time to recurrence was determined by Kaplan-Meier method. Median follow-up was 4.9 years.

Results: 3081 women were diagnosed with DCIS. 2098 (68%) had BCS and of those, 1100 had BCS alone and 998 received adjuvant RT. The most common age group having BCS was 50-59. The use of adjuvant RT increased from 25% in 2003 to 62% in 2012 (p <0.001). On multivariate analysis, factors associated with RT use included age ≤70, higher socioeconomic status, larger tumour size, higher grade and surgical margins <2mm. Invasive breast cancer recurrence at 5 years was 1.7% in adjuvant RT group versus 2.8% in the BCS alone group (p=0.11). Factors associated with an increased risk of invasive recurrence on multivariate analysis were younger age and surgical margins <2mm.

Conclusions: The use of adjuvant RT in Queensland has significantly increased from 2003-2012. Selection of patients for RT was based on clinicopathological factors associated with higher recurrence risk. Although longer follow-up is required, the selective use of radiation therapy after BCS is associated with a low rate of invasive breast cancer recurrence at 5 years.


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Aims
Between 2001 and 2015 the Herceptin Program (HP) provided trastuzumab to Australians with HER2-positive MBC. We aim to characterise treatment patterns and outcomes for this whole of population cohort.

Methods
This retrospective cohort study used linked HP records, PBS and MBS claims, and fact of death data obtained from the Department of Human Services. We stratified patients into four-year-of-trastuzumab-initiation groups: 1: 2001–2002; 2: 2003–October 2006; 3: October 2006–December 2012; and 4: December 2012–31 March 2014 (data censor date). We determined total duration of trastuzumab (date of initial dispensing until 21 days after last dispensing) and duration of the first course; a break of ≥90 days between dispensions was considered a separate course. We used Kaplan-Meier methods to estimate treatment duration and overall survival (OS). We used dispensing dates of cancer medicines to determine concomitant treatments, and MBS claims for echocardiography and MUGA scans to determine frequency of cardiac monitoring.

Results
5,631 patients received trastuzumab for MBC. Median age 56 years (IQR: 48 – 65). 11% had also received adjuvant trastuzumab. The median total duration of therapy was 13.7 months (IQR: 6.1 – 27.2). Median duration of first course of therapy increased from 8.5 months (3.4–20.8) in Group 1 to 13.8 months (5.9–29.4) in Group 3. Median OS increased from 21.8 months (9.5 – 53.6) in Group 1 to 34.4 months (15.1 – Not reached) in Group 3. 78% of patients received concomitant taxanes. Baseline cardiac assessment increased from 35% in Group 1 to 70% in Group 4. Overall, 57% had ≥1 cardiac assessment during treatment.

Conclusions
Similar to clinical trial estimates, duration of first course of trastuzumab and OS have increased over time. In keeping with similar to clinical trial estimates, duration of therapy was 13.7 months (IQR: 6.1 – Not reached) and duration of the first course; a break of ≥90 days after last dispensing) and duration of the first course; a break of ≥90 days between dispensions was considered a separate course. We used Kaplan-Meier methods to estimate treatment duration and overall survival (OS). We used dispensing dates of cancer medicines to determine concomitant treatments, and MBS claims for echocardiography and MUGA scans to determine frequency of cardiac monitoring.

Short-term findings of the PEGASUS Study: genitourinary symptoms, sexuality and quality of life in breast cancer survivors on endocrine therapy – what are we missing?

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Aims: The negative impact of adjuvant endocrine therapy on genitourinary symptoms in postmenopausal women with early breast cancer has been underestimated in clinical trials, limiting our understanding of the prevalence and severity of symptoms in these women.

Methods: A multi-center prospective questionnaire design was used to measure prevalence and severity of genitourinary symptoms, and their impact on sexual function and quality of life (QoL), in 177 participants before adjuvant endocrine therapy (baseline) and at 6-months.

Results: There was significant increase in prevalence of any incontinence (p=0.023), voiding (p=0.001) and vaginal symptoms (p=0.006) reported by participants over time. There was a trend in deterioration in symptom levels over time; increased severity was seen across 18 of the 29 symptoms assessed (62%). Urinary symptoms had a negative impact on household tasks (p=0.005), ability to travel (p=0.014) and fluid intake (p=0.038). Symptoms caused participants to feel worn out/tired (p=0.006), anxious (p=0.049) and bad about themselves (p=0.046). Partner relationships were challenged through deterioration in sexual function (p=0.005) and more sexual symptom bother (since baseline) (p=0.001).
Incidence of carcinoma in situ of the breast in NSW, Australia, from 1972 to 2009

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Aims
To describe temporal trends in the incidence of carcinoma in situ of the breast in New South Wales, Australia, between 1972 and 2009.

Methods
Observational study of women who received a diagnosis of ductal carcinoma in situ (DCIS) or lobular carcinoma in situ (LCIS) from 1972 to 2009 in the New South Wales Cancer Registry database.

Results
Among 8,721 women with DCIS, the median (range) age at diagnosis was 57 (21-97) years. DCIS incidence rose from a mean of 0.2 per 100,000 during 1972-1983 to 16.0 per 100,000 over 2005-2009, an 80-fold increase. Incidence increased across all ages, but more so in the target screening mammography group (50-69 years). Women aged 50-69 years comprised 56.8% of DCIS cases and had the highest recorded incidence of 46.6 per 100,000 during 1996-2009. DCIS as a proportion of all breast cancer was, on average, 0.4% during the pre-screening period 1972-1987, and increased to 12.0% after the establishment of screening (1996-2009). From 1985-2004, DCIS rates rose continually among all women. Since 2005, incidence increased in women aged 50-69 years, but stabilised in younger women and decreased in older women. Among 778 women with LCIS, the median (range) age at diagnosis was 52 (28-86) years. LCIS incidence rose from 0.2 per 100,000 during 1972-1983 to 1.6 over 2005-2009, an 8-fold increase. The magnitudes of these increases were highest among women aged 50-69 years; 4.6 per 100,000 during 1996-2009. LCIS as a proportion of all breast cancer was, on average, 0.2% during the pre-screening period (1972-1987), and 1.0% after the establishment of screening (1996-2009).

Conclusions
Incidence rates of DCIS and LCIS have increased over the past several decades, with the increase in DCIS much greater compared to LCIS. In women aged 50-69 years, DCIS rates have continued to rise, with an observable increase since 2005. Despite known under-recording of carcinoma in situ of the breast prior to 1992, our results show clear age differences in DCIS incidence increases associated with screening mammography.

Mammographic breast density change as a predictor of outcome in hormone receptor positive breast cancer.

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Aim: To investigate the association between mammographic breast density (MBD) change and disease free survival in hormone receptor positive breast cancer during anti-oestrogen therapy.

Methods: This was a single centre study performed at Royal Perth Hospital. Patients were identified from the hospital breast unit database with hormone receptor positive breast cancer planned for curative treatment between 1994-2011. Demographic, pathology, treatment and outcome data were obtained from the unit database, case notes, clinic letters, electronic radiology and pathology systems and the Western Australian Cancer Registry. Mammograms were obtained from the hospital radiology archives and Breastscreen Western Australia. Film mammograms were scanned to obtain digital images. MBD was read by single reader using Cumulus software. Percentage change in MBD was compared between groups. The mammogram taken at diagnosis and the first mammogram taken in the 9-18 month period post-diagnosis were compared.

Results: A total of 1921 patients were identified. At diagnosis 22% were premenopausal, 8% perimenopausal and 69% postmenopausal. 62% received tamoxifen as initial endocrine therapy, 13% letrozole, 18% anastrazole, and 5% ovarian suppression plus aromatase inhibitor or tamoxifen. Interim univariate analysis of 921 patients gave a disease free survival hazard ratio of 0.45 (95%CI 0.25-0.8; p=0.006) for those with MBD reduction of >20% relative to those with MBD reduction of <0%. MBD measurement has now been completed on the remaining mammograms and analysis of the full cohort will be presented.

Conclusion: Interim analysis shows that a greater reduction in MBD during anti-oestrogen therapy is associated with improved breast cancer outcome. Measurement of MBD change has the potential to allow tailoring of adjuvant endocrine therapy.

A 12 year population study of Ductal Carcinoma In Situ (DCIS): incidence, tumour characteristics and breast cancer recurrence in Queensland women

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Chemotherapy for early breast cancer in patients with comorbidity: a systematic review and meta-analysis

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Background: Patients with early breast cancer and co-existent comorbidities generally receive less guideline concordant curative treatment and experience worse prognosis. Depending on disease stage and subtype, chemotherapy can be an important treatment modality to reduce risk of recurrence and improve survival. Randomised trial data on chemotherapy use and tolerance in comorbid patients is limited.

Methods: A systematic search of databases was performed for English-language articles evaluating the impact of comorbidity on chemotherapy use in early breast cancer. Comorbidity was assessed as a specific condition, summary count or index. Outcomes of interest were receipt of chemotherapy, quality of chemotherapy delivery and occurrence of toxicity. Odds ratio’s (OR’s) stratified by level of comorbidity severity were derived where possible and results presented by narrative synthesis and meta-analysis.

Results: Sixty studies met inclusion criteria for systematic review. Most were observational cohorts and study populations were heterogeneous. Thirty-three studies evaluated receipt of chemotherapy, with 58% reporting reduced treatment, particularly with higher levels of comorbidity. Meta-analysis of 10 eligible studies returned OR’s of 0.88 (95% CI: 0.81-0.96) and 0.62 (95% CI: 0.50-0.78) for receipt of chemotherapy in patients with comorbidity scores of 1 and ≥2 respectively, compared with no comorbidity. Comorbidity had a generally adverse impact on the quality of chemotherapy delivery, although the 23 studies reported on greatly heterogeneous outcomes. Toxicity was also greater in patients with comorbidity, with two out of seven studies demonstrating higher non-completion of treatment and 10 out of 13 studies reporting greater odds of toxicity/hospitalisation during chemotherapy. Meta-analysis of three eligible studies reporting on chemotherapy-associated hospitalisation resulted in OR’s of 1.42 (95% CI: 1.20-1.67) and 2.23 (95% CI: 1.46-3.39) for comorbidity scores of 1 and ≥2 respectively.

Conclusions: Compared with their non-comorbid counterparts, patients with early breast cancer and comorbidity receive less adjuvant chemotherapy. Furthermore, if chemotherapy is received, treatment is of lower quality and greater levels of toxicity are incurred.

Burden of colorectal cancer in Australia attributable to lifestyle-related risk factors

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Aims: To quantify the avoidable burden of colorectal cancer in Australia by modifications in lifestyle-related risk factors.

Methods: Data on exposure to lifestyle-related risk factors from seven Australian cohort studies (N=367,772) were harmonised and pooled. The cohorts were linked to the Australian Cancer Database and National Death Index to identify incident cancers and deaths. The strength of the exposure-cancer association was estimated using a proportional hazards model, adjusting for age, sex and the other lifestyle exposures. Exposure prevalence was estimated from the Australian National Health Survey 2011-2012, except for red and processed meat consumption, which was estimated from the 45 and Up cohort study. These estimates were then combined to calculate the Population Attributable Fractions (PAFs) and their 95% confidence intervals (CIs) using an advanced method accounting for competing risk of death.
A life course approach to exposure to stressful life events and risk of major depressive symptoms in women after cancer: Results from the Australian Women's Wellness After Cancer Program (WWACP)

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There is evidence to suggest that exposure to earlier stressful life events (SLEs) can influence coping strategies and quality of survivorship in women after cancer diagnosis. In this study, we tested alternate life course models to determine which best described associations between exposure to stressors in childhood, adolescence, and adulthood, perceived stress, and self-reported health in women previously treated for breast, gynaecological, and haematological cancer. Data were drawn from 351 Australian women within 2 years of completing active cancer treatment who were participating in the Women’s Wellness After Cancer Program (WWACP) randomised-controlled trial. A model building framework compared the “accumulative risk” and “critical period” stress exposure hypotheses with the saturated model. The best fitting model was then used to explore the correlations between exposure to stressors across the life course, perceived stress (Perceived Stress Scale, PSS), and depressive symptoms (Center for Epidemiologic Studies Depression Scale, CES-D) in women after cancer. Excluding cancer diagnosis and treatment, around half of women aged 18-39 years (48%, n = 169), and 64% during the middle years (n = 228) reported exposure to stressors. Modelling suggested a graded effect between SLEs and health indicators that were consistent with the accumulative hypothesis. Moreover, among women who reported the greatest adversity across the lifespan, they also reported higher perceived stress (PSS, p = 0.02) and had a 2.38 higher odds of major depressive symptoms (95% CI 1.80 - 2.95) compared with those without accumulated SLEs. Findings showed that major depressive symptoms were increased in women with accumulated SLEs and highlights the need for supportive stress-management strategies in women previously treated cancer.

Place of death in patients with advanced NSCLC in South Western Sydney

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Place of Death in patients with Advanced Non-small Cell Lung Carcinoma (NSCLC) in South Western Sydney

Kirsten Duggan, Jennifer Wiltshire, Rebecca Strutt, Miriam Boxer, Angela Berthelsen, Joseph Descallar, Shalini Vinod.
Liverpool Hospital, NSW, Australia

Background:
Patients with advanced NSCLC have a limited life expectancy. Appropriate End of Life (EOL) care is one measure of quality of care in these patients. This includes suitable location of death to minimise unnecessary interventions which may occur in an acute care setting.

Aim:
To identify patterns in location of death and factors associated with each location, to indicate quality care at EOL.

Method:
Deceased patients diagnosed with Stage IV NSCLC between 2006-2012 were identified from the Area Cancer Registry. Death locations were categorised into Palliative Care (PC) and Acute Care (AC) hospital settings, and Other Death Locations (ODL); which included Aged-Care Facility and Home deaths. Patient, tumour and treatment data were analysed to identify associations with each location using multinomial regression models.

Results:
886 patients were identified. 63% of patients were male, with a median age of 69 years. 53% were born overseas and 25% preferred non-English languages. 65% received anti-cancer treatment. Most patients died in a PC setting (43%), followed by AC (37%). 12% of AC deaths occurred within the Emergency Department or Intensive Care Units. Patients aged over 84 years and those who received active treatment were less likely to die in AC. Non-English speakers had significantly increased odds of dying in AC settings.

Conclusion:
A significant number of patients with stage IV lung cancer died in AC settings suggesting the need for improvement, with greater involvement of the palliative care team. The relatively high number of deaths in ICU and emergency requires further analysis and investigation into the increased AC deaths for Non-English speaking patients is recommended.
Contrasting temporal trends in lung cancer incidence by socioeconomic status among women in Australia, 1985-2009

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Aim
We examined long-term trends in lung cancer incidence for women by socioeconomic groups in New South Wales (NSW), Australia.

Methods
Data on lung cancer incidence for women aged 25-69 years were extracted from the NSW Central Cancer Registry database. We divided the study cohort into five quintiles according to an area-based index of education and occupation (IEO) and calculated annual age-standardised incidence rates by IEO quintile for the period 1985-2009. The age-standardised incidence ratio (SIR) was estimated for IEO quintiles and 5-year period of diagnosis using the highest IEO quintile as the reference.

Results
Overall, lung cancer incidence for women increased gradually from 19.8 per 100,000 in 1985 to 25.7 per 100,000 in 2009. The trends by IEO quintile were somewhat comparable from 1985 through 1995, but from then on rates remained relatively stable for women residing in the highest quintile while increasing for women residing in the remaining four quintiles. Consequently, the SIR for all four of the lower IEO quintiles increased significantly over the 25-year period. For example, the SIR in the lowest IEO quintile increased from 1.16 (95% CI, 0.99-1.37) during 1985-1989 to 1.70 (95% CI, 1.50-1.93) during 2005-2009.

Conclusion
The increasing gap in lung cancer incidence between women in the highest socioeconomic group and all others suggests that there is a continued need for the broad implementation of tobacco control interventions, so that smoking prevalence is reduced across all segments of the population and the subsequent benefits are shared more equitably across all demographic groups.

Immunotherapy directions in breast cancer

Sherene Loi1
1. Peter MacCallum Cancer Centre, East Melbourne, VIC, Australia

Breast cancer has not been traditionally been considered a solid tumor type amenable to immune approaches. Correlative and biomarker data strongly suggest that immune infiltrates are positively prognostic hence raising the hypothesis that some breast cancer subtypes may be more immunogenic than others. Early phase trials evaluating checkpoint blockade in advanced breast cancer are still not complete nor definitive, but early data suggests that those who achieve a response can have durable disease control. Identifying who may respond and the best biomarker is still an area of ongoing and active investigation. In this presentation I will go through correlative, preclinical and status of current and future directions of clinical and biomarker data in the immunotherapy field related to breast cancer.


Management of Immunotherapy Toxicity

Alexander Menzies1
1. Melanoma Institute Australia, North Sydney, NSW, Australia

Systemic therapy for cancer is evolving rapidly, with drugs that promote anti-tumour immunity becoming ever more present in the clinic. Immunotherapy is now standard therapy for several cancers including melanoma, lung cancer, renal cell cancer, head and neck cancer, urothelial cancer, and Hodgkin’s lymphoma. It is anticipated that most patients will be treated with immunotherapy in the near future. Immunotherapy is a vastly different treatment to conventional cytotoxic and targeted therapies, with a different mechanism of action, response kinetics, durability and toxicity profile. Immunotherapy toxicities are immune based, can affect any organ at any time, and require vigilance and prompt management. Care for patients receiving immunotherapy requires a different approach to other treatments, and requires close supervision of patients in the community as well as an expert team of physicians able to manage immune toxicity. This talk will outline the nature and best management of common toxicities, and provide an organizational framework to safely manage patients on immunotherapy.

Immunotherapies- The pharmacist's perspective
Fear of cancer recurrence: how it relates to sleep disturbance and how can we manage it?

Deborah Fenlon
1. University of Southampton, Southampton, United Kingdom

Fears of recurrence (FoR) are likely to be experienced by most people who have been treated for cancer and around a third report that ‘they worry very much’. People with excessive fears of recurrence can become preoccupied and report excessive personal checking, frequent intrusive thoughts throughout the day and night, poor sleep, high levels of anxiety and lower quality of life. However, these fears are rarely addressed in clinical practice. Clinical nurse specialists (CNSs) routinely provide emotional and psychological support for people with cancer, yet evidence suggests that even when people express FoR to CNSs these are not always addressed.

Humphris and Ozakinci (2008) have developed an intervention for addressing fear of recurrence based on Leventhal’s self-regulation model. The AFTER intervention demonstrates significant reduction in fear. AFTER represents A=Assessment, F=Family, T=Thoughts and feelings, E=Examination and R= Returning of care. Having identified an effective tool for managing FoR there is now an imperative to embed it in practice. This raises a number of challenges around resource and questions as to who should deliver the intervention. While those with severe FoR may require referral to clinical psychologists, mild to moderate FoR can be debilitating without being regarded as sufficiently severe to warrant referral. A brief version of the AFTER has been developed to support those with mild to moderate FoR, which can be delivered by health professionals other than clinical psychologists.

An appropriate part of the work of the CNS is to enable people to discriminate between unrealistic fears and signs and symptoms of actual recurrence, to ensure early presentation of new disease. However, it is unclear whether CNSs would be willing or able to deliver the Mini-AFTER intervention. This presentation will report on current work in the UK to explore questions about how CNSs address and manage FoR.
Managing menopausal symptoms and sleep disturbance after breast cancer

Martha Hickey
1. Department of Obstetrics & Gynaecology, The University of Melbourne, Parkville, VICTORIA, Australia

Sleep disturbance after breast cancer is common and may be associated with several causative factors including menopausal symptoms, anxiety and/or depression and primary sleep disorders.

This presentation will discuss the causes and management of menopausal symptoms and sleep disturbance after breast cancer, with a focus on evidence-based interventions and clinically focussed approaches

Treatment Focussed Genetic Testing In Women with Breast Cancer – Why Do It?

Kelly-Anne Phillips
1. Peter MacCallum Cancer Centre, Melbourne, VIC, Australia

Genetic testing for mutations in the BRCA1 and BRCA2 genes should be actively considered for all women with breast cancer. Women with BRCA-associated breast cancer have a similar prognosis, stage for stage, to those without mutations. They have a higher risk of subsequent contralateral breast cancer, so contralateral mastectomy (with completion mastectomy if required) may be considered to reduce that risk. Retrospective cohort study results suggest substantially improved survival for mutation carriers who undergo contralateral mastectomy, but this finding needs confirmation in prospective cohorts. BRCA1 or BRCA2 mutation status may also influence systemic therapy decisions. The TNT randomised study showed that mutation carriers with metastatic breast cancer have higher response rates and better progression free survival if treated with carboplatin rather than taxotere. Data from GeparSixto also suggest a role for the addition of platinum in treatment of non-metastatic disease in mutation carriers with triple negative breast cancer. There is some evidence that endocrine therapy alone may be suboptimal for mutation carriers with ER positive, early-stage disease. PARP inhibitors, which exploit the DNA repair deficiency within BRCA-associated cancers, have demonstrated efficacy in the treatment of BRCA1 and BRCA2 mutation carriers with metastatic disease. The OlympiA trial, currently open at 14 Australian sites, through the ANZ BCTG, randomises BRCA mutation carriers with high risk, HER2 negative, non-metastatic breast cancer to 12 months of oral olaparib or placebo and will help determine whether PARP inhibitors improve outcomes in mutation carriers having treatment with curative intent. Free genetic testing is available as part of the screening component of this trial.

On the Road to Mainstreaming: Genetic Testing for Ovarian Cancer Patients within an Oncology Setting

Maira Kentwell
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In June 2014, The Royal Women’s Hospital Gynaecology team, and The Royal Melbourne Hospital Familial Cancer Centre (FCC) began work towards “mainstreaming” BRCA1/2 germline testing within the gynaecology and oncology outpatients setting. This involved a Genetic Counsellor from the RMH-FCC providing genetic counselling for patients with recently diagnosed high grade, non mucinous ovarian cancer who were attending outpatients or the chemotherapy day centre as part of their acute care.

This model has enabled infrastructure and necessary protocols to be put in place within the oncology setting for treatment-focused genetic BRCA1/2 germline testing to occur, involving genetic counselling expertise. In addition, the referral rate of patients with newly diagnosed high grade serous ovarian cancer at The Royal Women’s Hospital has increased significantly demonstrating that BRCA1/2 germline testing is increasingly being considered as standard of care by this gynaecology oncology team, with direct access to a genetic counsellor.

This presentation will outline the experience of this model, in particular, the Genetic Counsellor’s role, and how this has developed into a streamlined genetic testing process embedded within a gynaecology service. The presentation will also outline how the findings from this model have served as a platform to inform future mainstreaming practice, whereby an oncology specialist or nurse could arrange BRCA1/2 germline testing whilst closely supported by an FCC.

ENIGMA quantitative and qualitative classification criteria for evaluating the clinical significance of BRCA1 and BRCA2 sequence variants

Amanda B Spurdle
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Genetic testing for germline variants in susceptibility genes for breast and other cancers frequently identifies variants of uncertain clinical significance, including missense, small in-frame insertion/deletion, splice and regulatory region variants. Unclassified variants are a major clinical challenge as they complicate test reporting and genetic counselling, and prevent guided clinical management of patients and their relatives.

The ENIGMA (Evidence-based Network for the Interpretation of Germline Mutant Alleles) international consortium undertakes research to improve methods for classifying variants in breast cancer predisposition genes. To promote standardised classification, ENIGMA has established detailed criteria to classify germline variants in BRCA1 and BRCA2 using a 5 tier system that reflects probability of pathogenicity. ENIGMA is a ClinGen-designated expert panel for BRCA1/2 variant classifications, and ENIGMA classification criteria are currently being applied to variants identified by research and clinical testing sites internationally.

ENIGMA expert panel and research activities to date have:
Streamlined genetic education is effective in preparing women newly diagnosed with breast cancer for decision-making about treatment-focused genetic testing: A randomized controlled non-inferiority trial

J Kirk1,2, VF Quinn3, B Meiser4, KM Tucker4, KJ Watts5, B Rahman6, M Peate5,6, C Saunders6, E Geelhoed7, M Gleeson7, K Barlow-Stewart8, M Field9,10, M Harris11,12, YC Antill11,12, L Ciccarelli13, K Crowe14, MT Bowen14, G Mitchell for the TFGT Collaborative Group13,16

Aims: Increasingly, women newly diagnosed with breast cancer are being offered treatment-focused genetic testing (‘TFGT’). As the demand for TFGT increases, streamlined methods of genetic education are needed. This non-inferiority trial aimed to compare the efficacy of providing brief written education about TFGT in preparing women for decision-making about TFGT to conventional pre-test, face-to-face genetic counselling and to compare the resource-based costs of the two methods of education about TFGT.

Methods: Women aged

Results: This trial aimed to recruit 64 patients in each group (128 in total) to provide 80% power to claim that the intervention is no worse than usual care, with respect to Decisional Conflict Scale scores (primary outcome). 135 women were included in the analysis, all of whom opted for TFGT. Decisional conflict about TFGT choice was not inferior in the IG compared to the UCG (non-inferiority margin of -10, Mean difference=2.45, 95% CI [-2.87, 7.76], p=.36). Costs per woman counseled in the IG were significantly lower (A$89), compared to the UCG (A$173; (t115)=6.02, p<0.001).

Conclusions: A streamlined model of educating women newly diagnosed with breast cancer about TFGT appears to be a cost-effective way of delivering education, while ensuring that women feel informed and supported in their decision-making, thus freeing resources for other women to access TFGT.

Liquid Biopsies: Characterising the Cancer Genome in Blood

Sarah-Jane Dawson1

1. Peter MacCallum Cancer Centre, East Melbourne, VIC, Australia

Cell-free circulating DNA containing tumor-specific sequences can be identified in the plasma of cancer patients, providing a liquid biopsy alternative to tissue biopsies for monitoring cancer genetic changes over time. Circulating tumor DNA (ctDNA) analysis can allow real-time monitoring of tumor dynamics and treatment response from a simple blood test that is safe, reliable and easy to perform at regular intervals during therapy. Serial analysis of ctDNA provides a unique opportunity to study the evolving genomic landscape of a cancer during therapy, identify the early emergence of treatment resistance and guide targeted therapeutic decisions. The use of ctDNA for molecular disease monitoring has enormous potential to facilitate precision medicine and optimize cancer management across a range of malignancies. A summary of current approaches for ctDNA analysis will be presented, together with an overview of clinical applications for the use of liquid biopsies in cancer management.
Circulating and disseminated tumour cells in breast cancer

Linda McInness, Tony Blick, Viet Phuong Anh Le, Anthony Tachtsidis, Vijaya Sundararajan, Peter FM Choong, Claudia Di Bella, Michael Henderson, Christobel Saunders, Alex Dobrovic

Introduction: ctDNA can be detected and monitored using specific assays for the presence of CTCs, and sometimes in longitudinal samples. The best evidence for CTCs was found in a HER2 amplified MBC patient, with ~10^5 fold higher levels of HER2 mRNA, and higher levels of several other genes. Integration of batched data with longitudinal data from EBC is ongoing, as is alignment with clinical history. CTCs and DTCs are detectable by this qRT-PCR analysis in a subset of women with either EBC, LABC or MBC, but are relatively rare, and our ability to molecularly profile them is compromised by detection of significant levels of many of our genes in blood cells that have bound to the immunobeads during the isolation process. Some molecular markers appear more prominently, and with lower background values, and may be of use in characterising and monitoring the CTC and DTC compartment.

The EMPathy BCN gratefully acknowledges the support of the National Breast Cancer Foundation (CG-10-04: http://www.empathybcn.org.au).

Liquid biopsies from solid tumours.

Alexander Dobrovic

Analysis of circulating tumour DNA (ctDNA) in liquid biopsies is an invaluable new tool for the management of cancer. However, ctDNA is often present as a small fraction of the circulating free DNA. As a consequence, most technologies used to analyse tissue biopsies are unsuitable because of their limited sensitivity. Droplet digital PCR (ddPCR) has proven capable of meeting many of the challenges in assessing ctDNA showing both high sensitivity and specificity. A particular advantage of ddPCR is a rapid turnaround time with urgent results being available in less than 6 hours after receipt of a blood sample. A second advantage is absolute quantification of templates which facilitates monitoring of response to therapy and minimal residual disease. However, the identification of a truncal tumour specific change is a necessity. Driver mutations are ideal but not always present.

Vijaya Sundararajan, Tony Blick, Viet Phuong Anh Le, Anthony Tachtsidis, Christobel Saunders, Alex Dobrovic

Circulating cell-free tumour DNA in cancer: Post Therapy Monitoring.

Glenn D Francis

Introduction: The first cancer biomarker was described in 1848 when the presence of immunoglobulin light chains in urine was identified in 75% of patients with multiple myeloma. Circulating tumour DNA fragments (ctDNA) contain identical genetic defects to those seen in the primary tumour and because ctDNA fragments are released from all parts of the tumour ctDNA is a liquid biopsy. Advances in molecular technology have resulted in the development of new techniques enabling the detection of DNA molecules in body fluids such as blood, cerebrospinal fluid and urine.

Methods: ctDNA can be detected and monitored using specific assays for tumour and patient specific mutations or by using de novo sequencing looking for a broader range of mutations. Methodologies include novel sequencing technologies, massively parallel sequencing, highly sensitive quantitative polymerase chain reaction (PCR) testing, digital PCR and BEAMing (beads, emulsions, amplification and magnetics) digital PCR.
Results: This approach can be used to monitor disease burden following curative cancer surgery or neoadjuvant therapy. ctDNA is a potential marker of residual disease after surgery and the changes of ctDNA in response to treatment is consistent across all tumour types studied. Levels of ctDNA correspond with the clinical course and ctDNA increases with disease progression and correspondingly decreases with response to therapy. ctDNA can also be used to monitor the development of resistance to therapy during treatment. This has been demonstrated for leukaemia, lung cancer, bowel cancer and malignant melanoma. Data will be presented showing the application of ctDNA in patient care.

Conclusion: The implementation of new technologies has enabled the detection of ctDNA in blood in a clinical diagnostic setting and patients can now be monitored over time to assist in the assessment of response to treatment. The testing is specific to each individual’s tumour and forms part of personalised medicine.
showed that being male, having high doses of radiotherapy, concurrent chemotherapy and being heavier at the start of treatment, were all highly predictive of having an unplanned admission for NIS.

Conclusion: There is no difference in the rate of unplanned admissions or % weight loss for HNC patients managed under Prophylactic versus Reactive tube feeding approach. This study has identified a number of predictors that can be used to develop targeted treatment care pathways to identify at risk patients and improve nutrition outcomes, reduce healthcare costs from unplanned admissions and thus optimise patient quality of life.

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Treatment with six cycles of CVP or R-CVP after involved field radiation therapy (IFRT) significantly improves progression-free survival compared to IFRT alone in stage I-II low grade follicular lymphoma in a randomized controlled trial: Results of TROG 99.03 / ALLG/NHLLow5


1. Peter MacCallum Cancer Centre, East Melbourne, VIC, Australia

Aim: Involved field radiation therapy (IFRT) alone is potentially curative in stage I-II low-grade follicular lymphoma (FL) but relapse occurs in >50% of cases, predominantly outside RT fields. We hypothesized that systemic therapy given after IFRT would improve disease control, as assessed by progression-free survival (PFS).

Patients and Methods: This randomized controlled trial enrolled patients (pts) from Australia, New Zealand and Canada. Eligible patients had stage I-II low-grade FL (grade 1,2 or 3a). Staging included CT scans and marrow biopsy. FDG-PET staging was permitted but not mandated. Pts were randomized to either: A: IFRT alone or B: IFRT followed by 6 cycles of cyclophosphamide 1000 mg/m² IV D1, vincristine 1.4 mg/m² D1 and Prednisolone 50mg/m² D1-5 (CVP). A 2006 protocol amendment added Rituximab 375 mg/m² D1 to arm B (R-CVP). Randomization was stratified by center, stage, age (<80/â‰¥80) and whether PET-staged.

Results: From Feb 2000 to July 2012, 150 patients were recruited: 75 per arm. In Arm B, 44 patients were allocated CVP and 31 R-CVP. At randomization 75% had stage I, median age was 57 years, 52% were male, 48% were PET staged and 8% had an extranodal site (ENS). Median potential follow-up time was 9.6 years (range, 3.1-15.8). Major protocol deviations occurred in 2%. PFS was significantly superior in the (R-)CVP arm, Arm B, HR 0.57 (95% CI 0.34-0.95) p=0.033. Those Arm B patients randomized to R-CVP had markedly superior PFS compared with those randomized to IRRT alone after the trial amendment, HR0.26 (95% CI 0.07-0.97) p=0.045. Other factors associated with superior PFS were ENS (p=0.02), fewer involved nodal regions (p=0.047) and PET staging (p=0.056). Fewer patients had transformation to high-grade lymphoma in Arm B (4 vs 10). Ten deaths were observed in Arm A vs 5 in Arm B but overall survival (OS) is not currently significantly different (p=0.4); 10 yr rates 95 vs 87%.

Conclusion: Systemic therapy with CVP or R-CVP after IFRT significantly improved PFS compared to IFRT alone, potentially defining a new standard of care.

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Frailty index (FI) predicts chemotherapy outcomes in patients with solid tumours aged ≥ 65 years: Prospective, longitudinal study

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3. University of Queensland, Brisbane

Aim This prospective, longitudinal study determined whether a frailty index (FI) could predict chemotherapy outcomes in a consecutive series sample of 175 patients with solid tumours aged ≥ 65 years.

The objectives were to:
1. Develop an FI derived from a comprehensive geriatric assessment (CGA) process.
2. Compare established FI cut-points of ≤ 0.25 and > 0.25 with:
   a. Baseline assessments of fitness for chemotherapy derived from Vulnerable Elder’s Survey-13 (VES-13) and oncologists’ assessments, and prescribed chemotherapy.
   b. Treatment outcomes (intra-treatment chemotherapy alterations, treatment completions, one-year survival).

Method Variables included baseline CGA, VES-13 and oncologists’ assessments, and longitudinal treatment outcomes (e.g. treatment changes, one-year survival).

The total number of CGA deficits measured per patient was 42. The FI was determined as the number of deficits per patient divided by the number of deficits measured, to elicit a continuous measure (0.0 to 1.0) signifying extent of deficit accumulation and likely frailty. FI > 0.25 flags increasing frailty to the theoretical maximum of 1.0.

Results The FI could be calculated on all patients. The index had a right-skewed distribution with mean (SD) of 0.31 (0.14), and median (IQR) of 0.27 (0.21-0.30). The 99% limit to deficit accumulation was below the theoretical maximum of 1.0, at 0.75. FI was significantly related (p < 0.001) to vulnerability as assessed by VES-13 and doctors’ assessments of frailty. Baseline frailty was associated with treatment outcomes (Terminated, Completed, Not Planned) (p < 0.001). The “Not Planned” group were significantly frailer than the other two groups. Kaplan-Meier analysis indicated a trend for better cumulative survival in the < 0.25 group compared with the > 0.25 group.

Conclusion The FI could contribute to oncogeriatric decision-making in the chemotherapy setting. The FI demonstrated good construct validity against the VES-13 and the treating oncologists’ assessments of fitness for treatment.
Effects of a structured exercise program on physical activity and fitness in colon cancer survivors: One year feasibility results from the CHALLENGE trial and study update

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Methods
From 2009 to 2014, 273 colon cancer survivors (high-risk stage II/III) from 42 centres across Australia and Canada were randomised to a structured exercise program (SEP; n=136) or health education materials (HEM; n=137). Primary feasibility outcome in pre-specified interim analysis was difference between groups of ≥5 metabolic equivalent task (MET)-hours/week in recreational PA after 250 participants reached 1-year follow-up. Secondary outcomes included health-related fitness.

Results
The SEP group reported an increase in recreational PA of 15.6 MET-hours/week compared with 5.1 MET-hours/week in the HEM group [mean difference +10.5; 95%CI =+3.1 to +17.9; P=0.002]. The SEP group also improved relative to HEM group in 6-minute walk (P< 0.0001), 30-second chair-stand (P<0.001), 8-foot up-and-go (P=0.004), sit-and-reach (P=0.08) and predicted VO2max (P=0.068). The CHALLENGE trial continues to accrue internationally, with additional sites opened in USA, France, South Korea, Israel, United Kingdom. Australia has 24 sites across five states, with 158 patients randomised. Internationally, the trial has accrued 468 participants of planned 962. The study involves teams of exercise physiologists/physiotherapists working with oncologists and Clinical Trials coordinators.

Conclusions
The behaviour change intervention in the CHALLENGE Trial produced a substantial increase in self-reported recreational PA that met the feasibility criterion for trial continuation. Objective improvements in fitness are consistent with PA levels associated with improved colon cancer outcomes in observational studies. These interim data indicate that the CHALLENGE trial is poised to determine the causal effects of PA on colon cancer outcomes. It is important to complete recruitment to this innovative trial.

The pre clinical detection of Non Hodgkin's Lymphoma through serial measurements of serum CA 125 among post menopausal women participating in the United Kingdom collaborative trial of ovarian cancer screening

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Aim: Screening for ovarian cancer in women aged 50-84, using serial serum CA125 assay in a risk of ovarian cancer algorithm (ROCA), may reduce mortality from this disease. Other conditions such as non-Hodgkin lymphoma (NHL) are known to express CA125 > 35U/ml in approximately 40% of cases at the time of clinical diagnosis and could also be intercepted during a pre-clinical phase.

Methods: A prospective pilot study was performed in one centre of the United Kingdom Collaborative Trial for Ovarian Cancer Screening (UKCTOCS). 4775 women aged 50-74 were recruited to the multimodal arm of the study in Portsmouth and underwent annual CA125 testing, supported by repeat serum assay and imaging examination when indicated. During ten years, 32,642 annual screening episodes were conducted. 273 individual women with persistent abnormalities were identified by protocol defined criteria and seen by one gynaecological oncologist.

Results: Four of these 273 women were consequently diagnosed with high risk NHL: 2 were entirely asymptomatic. In all 4 cases a trebling of the CA 125 from the individual’s original baseline level was observed prior to definitive biopsy. This factor of change discriminated the NHL women with 100% sensitivity and specificity from 25 aged matched controls referred to the screening clinic who turned out to have benign causes of their ROCA anomaly. The histology dictated that all 4 women were treated with chemotherapy. Eight years after her NHL diagnosis, 1 of the 4 was diagnosed with biopsy-proven primary squamous cell lung carcinoma, and died 8 months later. The other 3 women are relapse free more than 5, 10 and 11 years from NHL diagnosis.

Conclusions: It is appropriate to undertake a CT scan of the chest and abdomen as well as evaluating the pelvis following ROCA index abnormalities, as non-gynaecological causes of rising CA125 levels may be identified fortuitously.
Exploring the rationale, experience and impact of using Cancer Information and Support (CIS) services: An international qualitative study

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Aims
Cancer Information and Support (CIS) services are an important source of community-based practical, informational and emotional support for people affected by cancer (PABC) worldwide. They typically include cancer helplines predominately used by people with breast cancer and supportive care programs which act as a useful adjunct to cancer treatment services. CIS services are rarely evaluated for their contribution to outcomes that extend beyond customer satisfaction. Cancer Council Victoria (Australia), Cancer Research UK and the American Cancer Society collaborated in this world first study which aimed to develop an in depth understanding of the rationale, experiences, evaluation and outcomes of using CIS services.

Method
This study utilised a grounded theory qualitative research design. Semi-structured interviews were used to gather data from CIS users between November 2015 and January 2016. Participants were eligible for inclusion if they had utilised a CIS in the participating organisations in 2015 via telephone contact with a CIS nurse, and identified as a PABC or friend/family member. Telephone interviews were recorded, de-identified, transcribed and thematically analysed.

Results
Thirty service users (10 from each country’s CIS) were interviewed. Four major themes emerged: i) Drivers for access ii) Experience iii) Impact and iv) An adjunct to cancer treatment services. Sub-themes included previous hospital experience; seeking answers; nurse as a therapeutic communicator and problem solver; CIS is for everyone; a safe open door; positioning and integration with cancer treatment services; and increased competence and confidence to manage own health and wellbeing.

Conclusions
CIS nurses internationally act as expert navigators, educators and compassionate communicators who ‘listen between the lines’ to enable callers to better understand, contextualise and discuss their situation with their healthcare team and support networks. The positioning of CIS alongside cancer treatment services aids fuller integration of supportive cancer care which benefits both patients and clinicians.

Radiation therapists providing additional one-on-one education and support sessions prior to radiation therapy reduces patient anxiety

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Aims: The aims of this study were to determine whether a radiation therapist (RT) led education and support intervention for women with early breast cancer reduced anxiety and depression, decreased concerns about radiotherapy, increased patient knowledge of radiotherapy and improved patient preparedness.

Methods: A multiple baseline study was conducted with sites in Victoria, South Australia and Western Australia. Patients were eligible if they were scheduled to receive radiotherapy for early breast cancer. The intervention comprised two consultations with an RT, prior to treatment planning and on the first day of treatment. The consultations focused on providing sensory and procedural information to patients and reducing pre-treatment anxiety, RT’s received communication and consultation skills training. Usual care data were collected prior to starting the intervention at each site. Measures were collected on four occasions: after meeting with their radiation oncologist, prior to treatment planning, on the first day of treatment and after treatment completion. Outcome measures included anxiety and depression (measured using the Hospital Anxiety and Depression Scale), patient preparedness (Cancer Treatment Survey), concerns about radiotherapy (Concerns about RT scale) and patient knowledge of radiotherapy (Knowledge of RT scale). Generalised Linear Mixed Models were used to test the significance of between group comparisons.

Results: Usual care was received by 218 participants and 190 received the intervention. Significant between group differences were found for anxiety at the commencement of treatment and after treatment completion (p<0.05). However, there were no significant differences for depression. Additional significant differences were found for patient preparedness (at all subsequent time points), patient concerns about radiotherapy (prior to treatment planning and at treatment commencement) and knowledge about RT (prior to treatment planning and treatment commencement) (p<0.05).

Conclusion: This intervention was effective in reducing breast cancer patients’ anxiety and preparing them for treatment. Future work needs to focus on implementation.
How do I do that again? Vodcasts for patients with feeding tubes and swallowing difficulties

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Introduction: Patients undergoing cancer treatment receive a broad range of information from many health professionals which can quickly become overwhelming. Patients and carers find it difficult to process and remember information provided. Web-based educational tools are becoming more widely used as they allow their audience to watch when, where and how they want.

Objectives: This multidisciplinary project aims to develop a series of visual instructional modules (vodcasts) for patients with feeding tubes or swallowing difficulties.

Methods: Vodcast topics were determined through clinician, patient and carer focus groups. Patients were asked to describe relevant education received and their level of satisfaction, what gaps existed, and what vodcast topics would be most beneficial for future patients. Vodcasts were designed based on focus group themes, produced by a professional media company and planned for implementation into clinical practice at local and national health services.

Results: Focus groups identified that patient recollection of provided education was poor. Patients and carers acknowledged information overload and inability to recall and process the education provided. Confirmed vodcast topics included: how to administer a syringe bolus via gastrostomy, how to administer gravity bolus via nasogastric tube, administration of medications via feeding tubes, laryngectomy care and thickening fluids. The vodcasts are viewable online on the EvIQ website (www.eviq.org.au) and on USB or DVD.

Conclusions: Evaluation will be conducted at two time-points in 2016-2017. It is intended that vodcasts will increase patient safety/confidence, be an adjunct to face-to-face clinician education, provide an avenue for troubleshooting for patients/carers and promote best clinical practice.

Multidisciplinary care for women with Metastatic Breast Cancer (MBC): lessons learned from an implementation study

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Aims: This paper will report on lessons learnt from a study undertaken to implement and evaluate a multidisciplinary team (MDT) model of care for women with MBC and its impact on their care needs.

Methods: An exploratory, longitudinal repeated measures design. Women with stage IV MBC who received care at Peter MacCallum Cancer Centre (Peter Mac), aged over 18 years were recruited over 12 months. The MDT model consisted of a face-to-face meeting with a breast care nurse and social worker, being discussed at an MDT meeting and receiving a personalised care plan. Follow up time points were at 3, 6 and 9 months following receipt of a care plan.

Results: Sixty-two women (60%) who were an average of 2.7 years post diagnosis of MBC (SD=2.5) and 8.6 years post first diagnosis of breast cancer (SD=8.6) consented to take part. MBC was the first cancer diagnosis for 39% of women. The average age of participants was 60 years (SD=12). Lessons learnt: 1) there is considerable heterogeneity across cohorts of women living with MBC. This makes designing robust service enhancement studies challenging; 2) the requirement for scheduling face-to-face nurse and social worker consultations impacted on timely administration of follow up procedures and added considerably to existing social worker and nurse workloads; 3) despite considerable heterogeneity in unmet needs reported at baseline and at follow up time points, there were important commonalities including: fear about cancer spreading (46%), concerns about the worries of those close to you (35%) and uncertainty about the future (52%).

Conclusions: Our study failed to demonstrate impact on the care needs of women living with MBC. Lessons learnt have been invaluable in informing a new study to develop and test a patient-informed supportive care intervention that can accommodate the commonalities, heterogeneity and fluctuating needs of women living with MBC.

A Prospective two-year experience of a medical oncology advanced trainee in Queensland

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Introduction

The medical oncology curriculum covers five domains including basic sciences, public health, professional qualities, basic principles of the management of cancer and specific cancers of the body. The fifth domain requires knowledge in the management of all cancers, specifically assessing, managing and treating cancers in specific areas of the body. The majority of clinical training in this domain is routinely performed in an outpatient setting with experience from new patient clinical encounters (NPCE). We aimed to assess whether NPCE over two years addresses this part of the medical oncology curriculum.

Methods
Basic clinical information and management from all NPCE seen from February 2014 to February 2016 in the medical oncology outpatient’s department over three sites in QLD, Australia was collected prospectively. The diagnosis and management of patients were recorded.

Results
In total 290 patients were seen across three sites; Site A (N=96) over 6 months, Site B (N=72) over 6 months and Site C (N=122) over 12 months. The median age was 64 (range 21–93) years. Common sites of solid organ malignancies included breast (N=70), gastrointestinal (N=74), pulmonary (N=31), prostate (N=23), head & neck (N=20), genitourinary (N=16) and gynaecological (N=15). Other sites included melanoma (N=8), central nervous system (N=5), neuro-endocrine (N=9), anal canal (N=4), sarcoma (N=1) and others (N=14). The intent of treatment was curative in 164 patients. Prescribed drug treatment included chemotherapy (N=151) and targeted agents including endocrine management (N=49).

Discussion
Our experience has shown that a medical oncology trainee in Queensland has exposure to a variety of clinical encounters and management approaches in multiple tumour streams. To assess, manage and treat cancers, NPCE are a great learning opportunity. Areas of improvement include further exposure to sarcoma. A three-year clinical training programme could address this and consolidate our training with a greater ability to make treatment decisions.

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Lynch syndrome (LS): an education and support vacuum

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Background
1:280 Australians are believed to carry a faulty cancer repair gene associated with LS. The health system has no record of how many are diagnosed, cancer control services aren’t designed for those with multiple, different cancers; and there is no designated practitioner whose role it is to help those living with cancer and the threat of cancer, navigate the siloed health system and coordinate vital surveillance regimes.

Only about 40% of adults have the level of individual health literacy needed to meet the complex demands of everyday life. Individuals with LS are often left to manage alone without understanding the syndrome, its risks, the health system and where to access support.

Aims
Findings from Lynch Syndrome Australia’s (LSA) world-first 2015 survey of 465 health consumers shaped a two-year program. Initiatives were designed to address the main challenges, such as bespoke support and information, for some of the 100,000 affected Australians.

Method
Firstly, LSA designed a model for patient engagement that created a community of patients, practitioners and researchers which instilled a culture of cooperation with health consumers.  Next, they explored how to make consumers part of the solution and work in partnership with health care professionals to manage this lifelong condition by reviewing best practice worldwide.

Results
LSA delivered seven national seminars to 330 consumers who engaged with a network of 30 medical and research experts. LSA created leading-edge, evidence–based website and social media platforms, including an advocacy video viewed 10,500 times.

Conclusions
These initiatives represent the first coordinated support for those with LS. As more Australians are diagnosed, it is imperative to educate health professionals to be partners in care and support, as modelled by breast cancer nurse care.


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Targeting therapeutic resistance in HER2-positive breast cancer

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The routine clinical use of anti-HER2 targeted therapy has radically improved outcomes for patients with HER2-positive breast cancer. Relapse rates after adjuvant therapy are low, and the median overall survival of patients with advanced disease has lengthened significantly. Despite this, metastatic HER2-positive breast cancers almost invariably develop therapeutic resistance, mediated by a variety of biological mechanisms. In this presentation, I will discuss putative molecular mechanisms of therapeutic resistance in HER2-positive breast cancer and describe recent attempts to circumvent them in the clinic.

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Translating Molecular Insights in Estrogen Receptor signalling into Clinical Trials in Breast Cancer

Elgene Lim¹
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Estrogen receptor (ER) positive cancers represent the most common breast cancer subtype. While ER-directed therapies have tremendously improved the survival of women with ER-positive breast cancer, resistance to endocrine therapies occurs in a significant proportion of patients, through alternative/parallel signalling pathways, genomic or epigenetic mechanisms involving ER. A better understanding of these escape mechanisms to traditional ER-directed therapies have led to novel therapies being added to the armamentarium to treat ER-positive breast cancer. There is emerging data regarding regulation of ER genomic activity by other sex steroid receptors, which are commonly co-expressed with ER.
These findings have led to the initiation of clinical trials through selective harnessing of sex steroid receptors to "push" ER towards anti-tumorigenic activity. This talk will focus on the biological rationale of novel therapeutic strategies for ER-positive breast cancer, and review the challenges faced translating these strategies into clinical trials.

Drug Interactions with targeted Therapies

Gail Rowan1, 2
1. Medicines Information Services, Peter MacCallum Cancer Centre, Melbourne, VIC, Australia
2. Pharmacy, Peter MacCallum Cancer Centre, Melbourne, VIC, Australia

Drug-drug interactions have always been present in the treatment of breast cancer. From early in the use of tamoxifen it was recognised that the use of other drugs can affect how this agent works, with therapies like antidepressants and "natural anti-menopause" supplements having the potential to affect tamoxifen activity.

The explosion of treatment options for breast (and other) cancers including oral kinase agents, monoclonal antibodies and other novel therapies has only widened the arena and possibility of drug-drug or drug-supplement interactions that can adversely affect a patient's treatment. Both pharmacokinetic and pharmacodynamic interactions are now being better documented and becoming better understood as our use of these newer agents evolves.

This talk will address the major contributing factors in drug interactions with targeted agents and some of the ways these can be predicted and potentially mitigated.

Nursing management in advanced disease

Jenny Gilchrist1
1. Macquarie University Hospital, Sydney,

The management of patients with advanced breast cancer is often complex and requires the involvement of the multidisciplinary team. With the emergence of an increased number of targeted therapies in the past five years, the role of nurses is becoming even more important especially with regard to the management of associated treatment side effects in the outpatient setting. Whilst novel agents now commonly allow metastatic cancer patients to remain on treatment for years, patients often require close supervision and monitoring for potentially life threatening toxicities. Educated specialist nurses are the key to successful management of these advanced cancer patients, facilitating safe administration of targeted therapies and enabling the patient to maintain optimal quality of life.

Male Breast Cancer: The Challenges

John Boyages1
1. Macquarie University, North Ryde, NSW, Australia

Male breast cancer (MBC) is rare with an estimated 150 men diagnosed in Australia this year, 12% of whom have a BRCA2 mutation. The median age at diagnosis is 71 years for men compared to 60 for women. Most men with enlarged breasts have "man boobs", a condition known as lipomastia or pseudogynaecomastia, characterised by unilateral or bilateral breast tenderness due to hormonal changes. In contrast, MBC tends to present as unilateral, often nodular tumours located close to the nipple, sometimes accompanied by bloody nipple discharge.

Initial investigation includes ultrasound and mammography, followed by core-biopsy of the primary lesion and often fine-needle biopsy of abnormal axillary nodes. Common histologies include infiltrating ductal (90%), papillary carcinomas (3%) and DCIS (2%). ER-positive disease accounts for 80% of patients and HER2-positive disease is uncommon (<5%). For patients presenting with larger masses or clinically positive nodes, a PET-CT or CT and bone scan is necessary to assess loco-regional and distant disease and help determine whether axillary dissection, sentinel node biopsy or IMC irradiation is required.

Treatment is total mastectomy and sentinel node biopsy, but some centres are selectively using breast conservation techniques. Most patients require post-mastectomy radiotherapy, as the disease is often advanced at presentation and obtaining clear margins can be difficult. Limited studies support the use of adjuvant tamoxifen and/or chemotherapy, but not aromatase inhibitors alone.

Significant male-specific psychological issues include “contested masculinity”, “concealment” and “interaction with health services”. Male patients face a disease dominated by pink and the female sex and lack of community awareness. Limited male-specific information and variation in guidelines re BRCA-testing exist. Close follow-up is required after to monitor the disease, the other breast and to potential screen for other second tumours such as prostate cancer.

Hormonal treatments after male breast cancer

Nicholas Wilcken1
The rarity of male breast cancer means that direct randomised trials of different treatments is not possible. We are left with having to assume that what works in women works in men, plus accumulating anecdotal experience. The amazing thing is that that is usually enough, although there are exceptions.

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**Psychological Issues in Male Breast Cancer**

**Jemma Gilchrist**

1. Mind My Health, Macquarie University Hospital, NSW, Australia

When society raises awareness or funding for breast cancer the symbols, colours and comments imply that breast cancer is an exclusively female disease. Whilst the vast majority are women, up to 1% are men. As breast cancer is rare in males, most men are not aware that they can develop breast cancer or how risk factors relate to them [1]. As a consequence, their pathway to diagnosis and treatment options differ from those of women. Men tend to present at a later stage of disease [2] and to undergo mastectomy [3]. Although society acknowledges that mastectomy is a confronting issue for a woman, mastectomy in men is also associated with significant body-image disturbance [4,5] which may not be openly addressed. Just as for females, endocrine treatment is an important part of care and there are associated mood and sexual changes. Most of the literature in the psychological adjustment to breast cancer has focused on women. While some aspects of emotional adjustment are shared, particular issues such as embarrassment, shame and masculinity [6] arise with the stigma of having a rare cancer, typically associated with a female body part and the hormone oestrogen. Psychological care is an essential part of the management of a woman with breast cancer and men are no less likely to benefit from targeted information and support. This talk will address the key emotional issues that men with breast cancer face and their specific information and service delivery [7] needs.


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**Male breast cancer: could I have faulty gene?**

**Judy Kirk**

1. Familial Cancer Service, Westmead Hospital, Sydney, NSW, Australia
2. Centre for Cancer Research, Westmead Millennium Institute, University of Sydney, Sydney, NSW, Australia

Male breast cancer (MBC) accounts for less than 1% of all breast cancers. The risk increases with age and the mean age at diagnosis is 60-70 years. Family history of breast cancer is an important risk factor for MBC but heritable mutations in the two major breast cancer susceptibility genes BRCA1 and (more often) BRCA2 account for only 10% or less of all MBC. PALB2 mutations have also been associated with an increased risk of MBC.

The possibility of a genetic susceptibility to breast/ovarian cancer should be considered at the time of MBC diagnosis. This is when the family history should be taken. Indications for testing the genes BRCA1 and BRCA2 have broadened but now include more rigorous assessment of the chance of finding a mutation based on a particular family history and/or breast cancer pathology. For BRCA2 related MBC, pathological grade is higher than for sporadic MBC, but decreases with age. BRCA1/2 MBC are higher stage, and more likely ER/PR positive compared to BRCA related cancers. For a man with breast cancer at age 75 with a known large family and no other cases of breast cancer, the chance of a BRCA mutation is 0.3%. The chance of finding a mutation increases considerably with family history of early onset breast cancer and/or epithelial ovarian cancer and with Jewish ancestry. Thus testing is offered based on age, family size, ethnicity and family history but is not undertaken in all males with breast cancer. Testing usually starts with an affected family member. It would not impact immediate management as men with a BRCA1/2 mutation do not have a high enough contralateral risk to advise bilateral mastectomy.

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**Clinical trials in the international neo adjuvant setting**

**Laura Esserman**

1. UCLA, CA, United States

The implementation of an international platform trial for breast provides a unique opportunity to accelerate the testing of agents that have a high likelihood of success when targeted to the appropriate biomarker subset in phase 3 trials. A platform trial is an extension of clinical practice where the standard for high risk patients is neoadjuvant therapy. Neoadjuvant therapy, in a patient where systemic therapy is indicated, allows the evaluation of response to therapy, and the ability to tailor surgical and adjuvant radiation based on response. A platform trial augments this approach by adding in standards for data collection, the seamless availability of vetted agents (from phase 2 trials) for the subsets of tumor types for which they are likely to be effective, and a more streamlined approach to generating outcomes, both short and long term. This approach,
Neoadjuvant Breast Cancer Clinical Trials in Australia

Prudence A Francis1
1. Peter MacCallum Cancer Centre, Melbourne, VIC, Australia

While Australian patients have participated in breast cancer clinical trials for decades, there have been few trials testing neoadjuvant therapy. Commencing in 2000, the Cancer Council Victoria sponsored an investigator initiated single-arm phase 2 neoadjuvant breast cancer trial testing anthracycline-taxane chemotherapy with growth factor support, in locally advanced breast cancers, unselected by phenotype. The Australia and New Breast Cancer Trials Group (ANZBCTG) conducted their first multi-centre neoadjuvant trial “NeoGem” with enrolment from 2006-2009, not as rapid as hoped. The NeoGem phase 2 trial had prospective tissue procurement for translational research and patients with tumours of at least 3 cm were eligible. Two cohorts were enrolled according to HER2 status. Combining patients with triple negative tumours plus those with hormone receptor-positive HER2-negative phenotype in one cohort, resulted in a lower pathologic complete response (pCR) rate in the HER2-negative cohort than anticipated. More recently there has been recognition that pCR rates in specific HER2-positive and triple negative phenotypes may be the most relevant to outcomes.

Successful recruitment to neoadjuvant therapy trials is enhanced at sites that have pre-operative breast cancer multi-disciplinary meetings, with the opportunity to consider patients with moderate size tumours for neoadjuvant therapy trials prior to surgery. There has been gradually increasing enthusiasm for neoadjuvant therapy trials in Australia, although most sites do not have capability for rapid recruitment currently. However, there have been successful examples of single/limited institutions recruiting well to in-house investigator initiated neoadjuvant trials (ie. SETUP trial at Monash/Frankston and NEONAB trial at Geelong, Victoria). Australian sites participated in the recent ETNA phase 3 international neoadjuvant trial, with the Australian participation led by Arlene Chan. In 2015 the ANZBCTG commenced enrolment in an investigator initiated NHMRC funded randomized phase 2 neoadjuvant breast cancer trial “ELIMINATE” with a plan for recruitment at 25 sites.

Decision aids, patient views and barriers

Nicholas Zdenkowski1
1. Calvary Mater Newcastle, Waratah, NSW, Australia

Neoadjuvant systemic therapy (NAST), including chemotherapy and endocrine therapy, continues to gain acceptance as a treatment option for selected women with large and/or highly proliferative, operable breast cancer. Whilst recurrence and survival outcomes are equivalent in patients treated with adjuvant compared with NAST, some women may prefer one treatment sequence over the other. This adds complexity at a time when women may be distressed by a recent diagnosis of breast cancer and are already facing decisions about multidisciplinary treatment options. Women (n=22) with a recent diagnosis of operable invasive breast cancer were interviewed, focussing on decisions about NAST. Women who were offered NAST (n=19) felt unable to participate in decision-making as fully as they would have liked, due to a lack of patient information, the complexity of the decision, and a sense of clinical urgency. Despite this, all participants endorsed NAST as a treatment option for tumour downstaging, to give time for consideration of other treatment options, for prognostic purposes and so that chemotherapy could be administered promptly.

Breast oncology clinicians from Australia and New Zealand (n=207) responded to an online survey on their views and practice with NAST. Seventy-eight percent reported routinely offering NAST to selected patients with operable breast cancer, however 45% and 58% wanted to increase the number in routine care and clinical trials respectively. Clinician-, patient- and system-related barriers prevented optimal use of NAST. Awareness and lack of information were key concerns.

To address the decisional complexity, lack of awareness and lack of information, a decision aid was developed for women with operable breast cancer who are considering NAST. The decision aid was based on patient and clinician perspectives, literature review, international patient decision aid standards and expert consultation. This decision aid is being tested in an ongoing prospective single arm longitudinal study.

The role of specialist nurses in supporting the patient undergoing neo adjuvant therapies

Janine Porter-Steele1
1. Griffith University, Queensland

The management of the patient undergoing neo adjuvant therapies requires an interdisciplinary approach, with each health professional having a clear and important role to effect a positive outcome not just in terms of treatment but also health related quality of life. The value of skilled nursing support cannot be underestimated as it can make a significant difference to the experience of patients and their families. Ensuring a coordinated approach with relevant, patient-specific verbal and written information combined with ongoing support for the patient and family can improve their care and alleviate some of the negative effects of a cancer diagnosis and anxiety around this type of treatment plan.
In the context of the patient diagnosed with breast cancer undergoing neo adjuvant treatment breast care nurses are ideally placed to coordinate investigations and admissions, keep patients informed and maintain communication between specialties. This allows patients to move through the hospital system smoothly and efficiently, increasing their confidence in the specialist team. Furthermore the role of the breast care nurse is one of support in the context of ongoing emotional care and provision of effective strategies to manage treatment side effects including evidence based lifestyle interventions throughout the treatment trajectory both in hospital and in the community. This presentation will highlight the role of the specialist breast care nurse in caring with this patient group.

Pain in cancer survivors

Paul Glare

1. Pain Medicine, University of Sydney, Northern Clinical School, St Leonards, NSW, Australia

According to the NSW Cancer Plan 2016, cancer survivorship refers to the process of living with, through, and beyond, cancer. Beginning at diagnosis, it includes people continuing treatment and even encompasses patients on palliative care/hospice. Pain in survivors broadly defined may be due to disease, anticancer treatments, debilitation or unrelated comorbidities. It is estimated 5-10% of disease-free survivors experience chronic, severe post-treatment pain. It rarely occurs in isolation: patients often have other physical symptoms and are anxious and depressed. ASCO recently released a Clinical Practice Guideline on the Management of Chronic Pain in Survivors of Adult Cancer. Due to the paucity of high quality evidence, many recommendations were based on expert consensus. They include:

- Clinicians should screen for pain at each patient encounter
- Survivors with new onset pain should be evaluated for disease recurrence/second malignancies
- The goal of treatment is improved function as well as pain relief
- Non-opioid analgesics/coanalgesics are first line pharmacotherapy
- A trial of opioids may be warranted - in carefully selected patients not responding to more conservative management
- If opioids are no longer warranted, they should be carefully tapered and ceased
- Referral to other health professionals to provide comprehensive pain management care should be considered for patients with complex needs

A key question going forward is whether post-treatment pain in a long-term survivor should be conceptualized as cancer pain or chronic non-malignant pain. Many survivors have both. Data from ePPOC are beginning to suggest that Australian cancer survivors have the same maladaptive psychological coping as other chronic pain patients, indicating more of a role for non-pharmacological interventions. A high level of collaboration between oncology, palliative care and pain services is needed to optimize outcomes for cancer survivor pain.


Physiotherapy strategies for cancer pain

Sharni Patchell

1. Physiotherapy Department, Peter MacCallum Cancer Centre, Parkville, VIC, Australia

Pain in patients following treatment for breast cancer is common. Pain may result from surgical incisions, reconstructive surgeries, lymphoedema symptoms, radiotherapy side effects, joint stiffness, systemic therapies, axillary web syndrome, scar management, peripheral neuropathy, surgical induced hypersensitivities, disease in situ and metastatic disease may require specialised physiotherapy treatment. Common musculoskeletal issues include shoulder and scapulothoracic dysfunction in this population. Delayed or absent physiotherapy management for acute pain in breast cancer patients results in unsatisfactory outcomes for patients.

Many patients experience prolonged acute neuropathic pain arising from their incision sites, from nerve damage intra operatively or following radiotherapy. Acute neuropathic pain can benefit from physiotherapeutic intervention. In many cases it assists in resolution or modulation of this pain. Untreated acute neuropathic pain commonly progresses to chronic pain and also interferes with return to normal activity. This can prevent return to premorbidity functioning and predisposes patients to other musculoskeletal complaints.

Additionally co-morbidities of a musculoskeletal or physical nature can amplify and complicate chronic pain. Chronic pain can also exacerbate other chronic health problems, limit capacity for physical fitness and reduce overall patient quality of life. Assessment and management of this patient group requires specialist physiotherapy skills and interventions to manage patients adequately. Chronic pain is burdensome and increases healthcare costs; timely physiotherapy intervention reduces this burden.

Physiotherapy techniques used to alleviate pain associated with breast cancer and its side effects will be discussed in this session along with relevant case examples.

Self-management of chronic malignant pain

Anthony Hall

1. Physiotherapy Department, Peter MacCallum Cancer Centre, Parkville, VIC, Australia
Acute and Persistent pain are now being recognised as different; representing changes in neural adaptation to noceception. Most patients have long-standing experience of acute pain acquired since childhood and may implement strategies based upon this experience when faced with persistent pain of either malignant or non-malignant origin. Management of Chronic Non-Malignant Pain is increasingly based upon providing patients with an understanding of these differences to enhance self-management strategies.

The author will argue that patients experiencing Chronic Malignant Pain would benefit from a similar educational foundation.

**Australian Cancer Pain guidelines**

Melanie Lovell

1. HammondCare, Greenwhich, NSW, Australia
2. University of Technology, Sydney
3. Sydney University, Sydney
4. ImPaCCT Palliative Care Trials Group, Sydney, New South Wales

Cancer pain is undertreated internationally. The Australian Cancer Pain guideline was launched at COSA in 2013. Since then, National Breast Cancer Foundation has funded a national cluster randomised controlled trial to implement the guidelines in cancer centres, enabling evaluation of the translation of evidence to practice. The latest evidence informing the guidelines will be reviewed and the implementation strategies described.


**Weight Loss Trials in Women Diagnosed with Breast Cancer**

Melinda Irwin

1. Yale, New Haven, CT, United States

Obesity affects the risk of breast cancer development and the risk of recurrence and death from breast cancer. Furthermore, weight gain after diagnosis of breast cancer (independent of BMI at diagnosis) is associated with higher all-cause mortality rates compared with maintaining body weight. The American Cancer Society (ACS) recommends cancer survivors achieve and maintain a healthy weight, follow a dietary pattern high in vegetables, fruits, and whole grains, engage in 150 minutes per week of aerobic exercise plus two strength training sessions per week, and avoid physical inactivity. Despite these recommendations, over 65% of breast cancer survivors are overweight or obese, and fewer than 30% engage in recommended levels of physical activity. Recently, the American Society of Clinical Oncology (ASCO) published a position statement on obesity and cancer with a multipronged initiative to reduce the impact of obesity on cancer, with one of the initiatives focused on determining best methods to help cancer survivors make effective changes in lifestyle behaviors. To date, only a few diet- and exercise-induced weight loss trials in breast cancer survivors have been published. We conducted a diet- and exercise-induced weight loss trial in overweight and obese breast cancer survivors, entitled the Lifestyle, Exercise and Nutrition (LEAN) Study, to examine the effect of weight loss on body composition and biological markers related to breast cancer. This study as well as other weight loss trials in women with breast cancer will be discussed, as well as future research and clinical and community-based weight management programs.

**Living well after breast cancer: can we improve outcomes for breast cancer patients through weight management?**

Marina Reeves

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Obesity, physical inactivity and poor diet quality have been associated with increased risk of breast cancer-specific and all-cause mortality as well as treatment-related side-effects in breast cancer survivors. Weight loss intervention trials in breast cancer survivors have shown that weight loss is safe and achievable; however, few studies have examined the benefits of such interventions on a broad range of outcomes and few have examined factors important to translation (e.g. feasible delivery method for scaling up, assessment of sustained changes, cost-effectiveness). The Living Well after Breast Cancer randomized controlled trial evaluated a 12-month telephone-delivered weight loss intervention (versus usual care) on weight change, a range of secondary outcomes and cost-effectiveness. Women (19-75 years; BMI 25-45 kg/m²) diagnosed with stage I-III breast cancer in the previous two years were recruited from public and private hospitals and through the state-based cancer registry (target n=156). Following baseline assessment, participants were randomized to either a 12-month telephone-delivered weight loss intervention (targeting diet and physical activity) or usual care. Data were collected at baseline, 6-months, 12-months and 18-months. Weight change at 12-months was the primary outcome. Secondary outcomes were changes in body composition, bone mineral density, cardio-metabolic and cancer-related biomarkers, metabolic health and chronic disease risk, physical function, patient-reported outcomes and behaviours. Data collected at 18-months will assess whether outcomes achieved at end-of-intervention are sustained six months after intervention completion. In total, 158 participants were recruited; (mean±SD) 55±9 years, 31.3±4.0 kg/m², 10.7±5.0 months post-diagnosis and 45.5% with metabolic syndrome. Study retention was 89.3% at 6-months, 81.8% at 12-months and 79.9% at 18-months. This presentation will discuss preliminary findings on secondary outcomes. Findings from this trial will add to the evidence needed to inform the wide-scale provision of weight loss, physical activity and dietary interventions as part of routine survivorship care for breast cancer survivors.
Investigating the association of alcohol with breast cancer recurrence and the way in which alcohol recommendations are discussed between clinicians and oncology patients

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Background: There is convincing evidence of a link between alcohol consumption and primary breast cancer. Less clear is the association between alcohol intake and breast cancer recurrence or development of second primary breast cancer in the survivor population. There is some evidence that clinicians are challenged by delivering clear and consistent advice to breast cancer survivors regarding alcohol intake.

Aim: To undertake a mixed methods study exploring the extent to which alcohol consumption is associated with breast cancer recurrence and the ways in which this is discussed between clinicians and patients.

Methods: A systematic literature review was undertaken of studies investigating the relationship between alcohol consumption and breast cancer recurrence using the following search phrase: (breast cancer OR breast adenocarcinoma OR breast neoplasm OR breast tumor) AND (alcohol* OR alcohol intake OR alcohol consumption OR ethanol) AND (recurrence OR second primary). A qualitative interview study was conducted with oncology clinicians to explore the provision of alcohol advice by healthcare professionals to breast cancer patients.

Results: Approximately half of the 16 included studies observed a modest positive association between alcohol consumption and increased risk of breast cancer recurrence or development of a second primary breast cancer, with some studies observing associations from as little as six grams of alcohol intake per day. Clinician interviews were undertaken with n=8 dietitians, n=9 breast care nurses and n=10 oncologists. The extent and nature of advice provided about alcohol was influenced by several patient and clinician factors.

Conclusion: There is some evidence that alcohol consumption increases the risk of breast cancer recurrence, particularly in postmenopausal women. The association between alcohol and development of a second primary breast cancer is less clear. Further work is required to support clinicians to deliver lifestyle advice to cancer patients in an accessible and practical way.

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Standardized ginger extract improves quality of life associated with chemotherapy-induced nausea and vomiting

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Ginger supplementation could be an effective adjuvant treatment for chemotherapy-induced nausea and vomiting (CINV); however, previous trials in this area have significant methodological limitations that preclude recommending the routine use of ginger in clinical practice.

The aim of this double-blind randomised controlled trial was to overcome these limitations and thereby determine the effect of adjuvant time- and dose-standardised ginger on chemotherapy-induced nausea (CIN)-related quality of life (QoL), compared to placebo, in chemotherapy-naïve patients over three cycles of moderately- or highly-emetogenic chemotherapy.

Fifty-one patients were randomly allocated to receive either 1.2 g of a standardised ginger extract or placebo per day, in addition to anti-emetic therapy. The supplements were divided into four capsules per day, consumed every four hours for five days during the first three cycles of chemotherapy. The primary outcome was CIN-related QoL measured with the Functional Living Index-Emesis (FLIE) questionnaire. Secondary outcomes included acute and delayed nausea, vomiting, and retching as well as cancer-related fatigue, nutritional status, and CIN and vomiting-specific prognostic factors.

In chemotherapy cycle 1, intervention participants reported significantly better QoL related to CIN (Median [25th, 75th percentile] = 61.5 [56.1, 63] vs 54 [46, 63]; p=0.029), CINV-related QoL (Median [25th, 75th percentile] = 124.5 [113, 126] vs 111 [99.2, 126]; p=0.043), global QoL (Mean±standard deviation = 85.1±18.9 vs 71.9±18.3; p=0.003) and less fatigue (Mean±standard deviation = 41.8±13.1 vs 32.2±10.8; p=0.007) than placebo participants. In cycle 3, global QoL (Median [25th, 75th percentile] = 83.6±15.0 vs 75.1±13.9; p=0.040) and fatigue (Mean±standard deviation = 42.4±10.2 vs 36.1±7.2; p=0.013) were significantly better in the intervention group compared to placebo. There was no difference in reported adverse effects.

This trial suggests adjuvant ginger supplementation is associated with better chemotherapy-induced nausea-related quality of life and less cancer-related fatigue, with no difference in adverse effects compared to placebo.

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Has mammographic screening delivered the expected mortality benefits for Queensland women?

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Aim

To assess the impact of mammographic screening during the period 2000 to 2005 on invasive breast cancer mortality among Queensland women.

Methods

This population based, retrospective study included females aged 50-65 without a prior history of breast cancer who were registered on the Queensland electoral roll in the year 2000 (n=263,259).

Data obtained from the Electoral Commission of Queensland (ECQ) was matched with screening data from BreastScreen Queensland (BSQ), and the Wesley Breast Screening Clinic (WBC). Death data for this study population was sourced from the Queensland Oncology Repository (QOR).

The screening behaviour of study participants during the years 2000 through 2005 was observed and participants were separated into screened and non-screened cohorts based on their attendance for mammography during this period. Women still alive at 1 January 2006 were included in the analysis and follow-up continued until 31 December 2013.

Survival analysis was conducted with breast cancer death as the outcome of interest and results were adjusted for age, socio-economic status, remoteness of residence and indigenous status.

Results

Matching ECQ data with screening data identified 189,712 women who had at least one mammographic screen during the observation period 2000 to 2005 (Cohort 1) and 73,547 women who had no contact registered with either screening service during the same period (Cohort 2).

Study participants who died from any cause (n=5,418) prior to commencement of follow-up in 2006 were removed from the study.

Cumulative breast cancer mortality after eight years follow-up was 0.51% among unscreened women and 0.26% in screened women. After adjusting for demographic factors, breast cancer mortality was 61% lower in the screening group.

Conclusions

The estimated breast cancer mortality reduction in Queensland women aged 50-65 attributable to screening in this study is higher than results reported previously within Australia and elsewhere.

Oncologists’ preferences for recommending expensive anticancer drugs

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Background: Oncologists and patients are frequently faced with difficult treatment decisions about expensive anticancer drugs. The aim of this study was to understand how different attributes of anticancer drugs, including their out-of-pocket costs, influenced oncologists’ recommendations.

Methods: Members of the Medical Oncology Group of Australia were invited to complete a discrete choice experiment online. Respondents were presented with 15 choice sets describing two hypothetical anticancer drugs (A or B) and were asked to indicate which they preferred to recommend to a hypothetical patient with advanced cancer. Drug B was assigned an out-of-pocket cost in most choice sets, whereas Drug A was always $0. A mixed logit model was constructed to determine the effect of different attributes and respondent characteristics on recommendations. Trade-offs between out-of-pocket cost and survival were calculated.

Results: We received 101 evaluable responses. Most respondents were fully qualified (75%) and had predominantly public (65%), metropolitan (78%) practices. Respondents were more likely to recommend anticancer drugs with longer survival (OR = 2.16 per extra month, p<0.0001) and higher chance of improvement in cancer-related symptoms (OR = 1.69 per absolute increase of 5%, p<0.0001), and less likely to recommend anticancer drugs with higher out-of-pocket costs (OR = 0.92 per extra $1000, p<0.0001) and higher chance of a serious adverse event (OR = 0.77 per absolute increase of 5%, p<0.0001). Respondents were willing to recommend anticancer drugs that would cost their patients on average $9395 (95% CI: $8586 - $10204) for each additional month of survival. Respondents only preferred Drug B over Drug A if the absolute survival gain was >2 months.

Conclusions: Australian oncologists are willing to recommend expensive anticancer drugs to their patients, exposing them to financial toxicity. A better understanding of patient preferences for expensive anticancer drugs and how oncologists can help patients determine their value is required.

How long are the intervals to diagnosis and treatment in NSW patients with lung cancer? A patient-reported perspective

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Background

Earlier access to specialist care can improve cancer survival rates. Regional patients may experience prolonged times to cancer diagnosis and treatment, but NSW data are lacking. The intervals from patient presentation to first GP referral to specialist and from GP referral to treatment start, are defined as the Primary (PC) and Secondary Care (SC) Intervals, respectively. Time from presentation to diagnosis, and diagnosis to treatment, are the Diagnostic and Treatment Intervals, respectively. The UK recommends patients transition from PC to SC within 2 weeks and achieve this in 55-70% lung cancer cases.

Aim

To assess the impact of mammographic screening during the period 2000 to 2005 on invasive breast cancer mortality among Queensland women.
We aimed to determine these intervals in a cohort of NSW lung cancer patients and compare regional and metropolitan patient data.

Methods
Design: cross-sectional, multi-site study using semi-structured interviews to construct time intervals, with dates verified from medical records.
Population: Patients within 12 months of a diagnosis of NSCLC/SCLC. The accrual target was 100 patients.
Analysis: Descriptive statistics were used to report each interval. Difference in the means for regional and metropolitan patients was assessed using a t-test.

Results
Four NSW cancer centres participated, referring 107 patients (35% regional, 65% metropolitan). The majority had Stage IV (65%) NSCLC (80%), were male (60%), Caucasian (86%), history of smoking (57%), ECOG performance status ≤1 (93%) and received systemic therapy (56%). The median Diagnostic Interval was 25 days (range 0–564, SD 73.5) and Treatment Interval was 22.5 days (range 0–120, SD 21.1). The large majority (87%) of patients were seen by a specialist within two weeks of GP referral. There were no significant differences in any intervals for regional versus metropolitan patients.

Conclusions
NSW is achieving a high throughput of patients with suspected lung cancer in recommended timeframes of within two weeks. All intervals for NSW lung cancer patients were comparable between regional and metropolitan sites.


Improving rural access to chemotherapy using a telechemotherapy model in Northern Queensland.

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Introduction
Rural access to specialist cancer care services can be improved through telechemotherapy models. In Northern Queensland, a novel telechemotherapy model (combining telemedicine, telenursing, and telepharmacy) was implemented by Cairns and Townsville Medical Oncology Departments, to provide chemotherapy services to rural and Indigenous communities.

Aim
To describe the feasibility, safety and sustainability of the telechemotherapy model in Northern Queensland.

Method
A descriptive analysis was performed using data collected retrospectively from the Townsville Cancer Center oncology information system (MOSAIQ) between 1st June 2014 and 1st June 2016. Demographics, episodes of care, primary tumour site, chemotherapy regime, dose reductions and delays, adverse effects, hospital admissions and mortality were described.

Results
During the study period, 62 patients (38 males and 24 females, 12.9% Indigenous) received 327 cycles of chemotherapy across 6 sites including Cooktown, Thursday Island, Weipa, Bowen, Hughenden and Ingham. Commonest cancers treated were Breast (35.5%) and Lung (17.7%). Treatment intent was adjuvant in 38.7% and palliative in 45.2%. Chemotherapy agents included low to medium risk single and combination agents (excluding vesicants and Oxaliplatin) and monoclonal antibodies. Chemotherapy delays occurred in 54.8% on 68 occasions (4.6% neutropenia), with dose reductions required in 35.5% on 22 occasions (11.3% neutropenia). Grade 3-4 adverse effects occurred in 11.2% of patients, most commonly due to neutropenic sepsis (4.8%) and peripheral neuropathy (2.5%). Hospital admission was required in 13% of patients on 26 occasions, with no treatment-related mortality. Our results are similar to current literature.

Conclusion
Our telechemotherapy model in Northern Queensland is feasible and sustainable, facilitating the provision of chemotherapy services to rural and Indigenous communities with an acceptable safety profile. Adherence to strict governance, adequate resources, and collaboration between hospitals and clinicians, are important for a large scale implementation of this model. Studies will be required to further assess cost-effectiveness.

Implementation of a clinical pathway for the screening, assessment and management of anxiety and depression in adults with cancer into cancer services. Providing the document is not enough.

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Anxiety and depression, the third largest cause of disability in Australia, is significantly higher in cancer patients. The ADAPT Program grant is funded to implement the clinical pathway for the screening, assessment and management of anxiety and depression in adults with cancer into...
routine cancer care. ADAPT aims to tackle issues of ownership; resources and responsibility; education and training, patient reluctance; and integration with health services.

Methods: Review of current implementation science literature and screening practices identified the need for resources to address staff and patient management requirements, provide education to support skills development and provide evidence-based interventions to address identified need. Supporting resources include: An online management system (ADAPTPortal) with validated online screening questionnaires, alerts when anxiety/depression is elevated, referral templates and evidence-based stepped-care management recommendations; an online health professional education program using evidence-based learning principles; patient information to normalise screening with links to existing resources for anxiety and depression, and; online psychological therapy programs (iCanADAPT) for patients with early or advanced cancer.

Results: The resources developed used evidence-based principles from implementation science, health professional education, health literacy and internet based psychological intervention research. The ADAPT Portal addressed the issue of integration beyond cancer services, by including community-based referral pathways. Allowing tailoring of the clinical pathway to service and staff capacity reflects available interventions and addresses local ownership and responsibility. The health professional education responded to the demand for education to support screening, referral recommendations and referral reluctance/refusal conversations. The qualitatively evaluated patient information addressed patient reluctance. The iCanADAPT programs being evaluated in RCT and pre-post studies provide an accessible evidence-based intervention appropriate for patients with moderate levels of anxiety/depression.

Conclusions: Implementing screening for anxiety/depression is hindered by concern about meeting previously unidentified need. Evidence-based resources to address known barriers are key to implementation success and sustainability.

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Improved efficiency and patient satisfaction following introduction of a nutrition assistant role in a head and neck cancer clinic
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Aim: At Peter MacCallum Cancer Centre, patients with head and neck (H&N) cancer receiving curative intent (chemo)radiation are managed in a twice-weekly multidisciplinary clinic. Patients are seen by a dietitian weekly during treatment and fortnightly up to six weeks post treatment. However, dietitians have limited time to manage complex H&N patients. Nutrition assistants (NA) work in the inpatient and ambulatory settings, performing nutrition screening and basic nutrition intervention for low nutrition risk patients. This study aimed to evaluate the effectiveness of implementing the NA role for screening and intervention of lower risk patients in the multidisciplinary head and neck clinic.

Methods: A training module and model of care were established to upskill the NA and guide the screening and interventions to be undertaken. A pre-test post-test design was utilised comparing outcomes pre- and post-implementation of the NA role. Outcomes included proportion of dietitian time spent with high risk patients, weight change during and post-radiotherapy and patient satisfaction assessed at 6-weeks post-treatment using a valid satisfaction with nutrition services questionnaire.

Results: Forty-three patients were included pre-implementation and 48 patients post-implementation with 21 (44%) of patients identified for NA screening/ intervention. Proportion of dietitian time spent with high risk patients, weight change during and post-radiotherapy (-5.6% vs. -4.7%, p=0.3) and up to 4 weeks post-radiotherapy (-6.6% vs. -6.49%, p=0.9). Significant improvement in overall patient satisfaction (4.0 + 1.1 vs 4.6 + 0.61, p=0.03), patient perceived benefit (3.8 + 0.69 vs 4.4 + 0.62, p<.01) and dietitian interpersonal skills (3.91 + 1.1 vs 4.6 + 0.55, p=0.02) were observed post-implementation.

Conclusions: Nutrition assistants are an effective workforce to manage low risk patients in a multidisciplinary H&N treatment clinic demonstrating maintenance of clinical outcomes, improved efficiency and increased patient satisfaction.

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Breast cancer-related lymphedema: incidence and risk factors
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Lymphoedema is a feared disease, associated with the treatment for breast cancer. It is typically characterised by regional swelling (in one or both arms, breast and/or trunk) due to excess accumulation of protein-rich fluid in body tissues. The presence of lymphoedema leads to upper-body morbidity, as well as physical, functional, social and psychological concerns. Findings from a meta-analysis suggest that 21% of women will develop lymphoedema following breast cancer. Lymphoedema incidence seems to increase over time, at least up to 24 months after breast cancer, with new cases presenting beyond this period at a much slower rate. The odds of developing lymphoedema are about 4 times higher for those who have had axillary lymph node dissection compared with those who underwent sentinel node biopsy. There is also consistent evidence that lends support to several other risk factors for lymphoedema, including more extensive surgery, a high body-mass index, adjuvant therapy, and low physical activity. Understanding risk factors provides information about potential targets for future prevention and management strategies with incorporating physical activity and exercise, as well as weight management strategies into standard breast cancer care worthy of future investigation. Given that the incidence of breast cancer worldwide is increasing, understanding the incidence of subsequent secondary lymphoedema and its associated risk factors is clearly of public health importance.
Monitoring for the Early Detection of Breast Cancer Related Lymphoedema: A proactive approach to early detection, assessment and management

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For women who have survived breast cancer, the development of lymphoedema can be a distressing event and often a daily reminder of their breast cancer experience. Lymphoedema can be a chronic debilitating condition resulting in an increased risk of infection, arm swelling and pain, all of which may limit function and negatively impact on quality of life. Women are often highly fearful about developing lymphoedema despite the low risk for most of them in developing the condition.

This presentation will outline a prospective model of care focused on active monitoring to facilitate early detection and management of lymphoedema, which can be effective in reducing the long term physical, functional and psychological effects. Preoperative assessment, ongoing surveillance and early intervention can enhance function and reduce morbidity. Early assessment and intervention using a “toolbox” of evidenced based strategies should be the standard practice within a multidisciplinary team approach for women receiving breast cancer care. Personalised care according to individual circumstances, lifestyle and goals is also an important component of best practice management.

Women should be encouraged to participate in an ongoing education program to provide them with a greater understanding of their lymphoedema risk and enable them to feel more in control of their condition and empowered to return to normal activities & exercise.

Detecting, monitoring and treating early stages of lymphoedema is important for the long term program to achieve optimum outcomes of the condition and ultimate quality of life for the woman. This presentation will highlight current international best practice models of care and associated outcomes.

Surgical approaches for the management of lymphoedema

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“At my lowest, I begged my doctor to amputate my arm, so the pain and discomfort would end.”

Rates of breast cancer related lymphoedema range from 5-8% with sentinel node biopsy, 20% with axillary node dissection or radiation, and >50% for patients treated with surgery and radiation.

Recent advances in surgical management of lymphoedema have provided options for patients for whom conservative management has failed, but questions remain about timing, technique, post-operative care and mechanism of action. In mild to moderate cases of lymphoedema, microsurgical techniques including autologous lymph node transfer (LNT) and lymphovenous anastomosis (LVA) are being performed. Medical liposuction is well established for patients with advanced lymphoedema.

LNT harvests healthy lymph nodes from one region (e.g., superficial inguinal nodes) and transplants them either to the original site of injury (e.g., axilla or groin) or to other areas within the lymphedematous limb. Studies are limited to case reports or series, often with limited follow-up.

LVA, a safe, minimally-invasive, microsurgical technique performed via small limb incisions is for patients whose condition cannot be managed conservatively or who suffer from recurrent infection. Fine anastomotic connections between a functioning lymphatic selected by advanced infra-red imaging and a subdermal venule are created. Results vary so standardised diagnostic, assessment and surgical treatment protocols are required.

As lymphoedema progresses, adipogenesis from mesenchymal stem cells results in large depositions of fat. The indications for liposuction include non-pitting oedema that has not responded to conservative management; arm volume differences of at least 600 cc; and no evidence of cancer recurrence. Significant physical, functional and psychological improvements occur after treatment which has a near 100% volume reduction success rate, although life-long wearing of compression sleeves is required.

Further human, cadaver, animal and basic research is required to understand the underlying pathophysiological mechanisms of lymphoedema and associated surgical interventions.

The lived experience of breast cancer-related lymphoedema

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Adjusting to a diagnosis of breast cancer is complex. The initial focus is typically on decision-making and negotiating treatments which may be associated with considerable morbidity. Many women cope by thinking “one day at a time”. Completion of treatment is often anticipated as a time to resume a semblance of normal life, but the reality is often quite different. Many women describe feeling anxious and uncertain about how to adjust especially if others do not appear to understand their life-changing experience. The subsequent development of lymphoedema can lead to additional changes in self-perception and functional ability which in turn exert further pressure on roles and relationships.

This presentation describes the emotional impact of lymphoedema, including discussion of the factors which may influence adjustment. Clinical vignettes will be used to illustrate opportunities for health professionals to promote adjustment.

Facilitating lymphoedema detection and management through telehealth

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Many people with lymphoedema report difficulties accessing appropriate assessment and treatment, particularly over the long term. This may be because local services are unavailable, or because travel to services is difficult or inconvenient. Incorporating a multi-disciplinary telerehabilitation service into current models of care for people with lymphoedema may have a number of benefits, including enabling early diagnosis, improved long-term management, and supporting patients to more effectively self-manage their condition. While this may be particularly helpful for those living in rural and remote areas, it could also assist those who work full-time or have caring responsibilities, have difficulty driving, and/or have been unable to find a local appropriately trained lymphoedema therapist.

We will discuss recent advances in telerehabilitation research and service delivery, and introduce the eHAB telerehabilitation system. eHAB is an internet-based videoconferencing system that enables remote consultations between health professionals and patients. Previous research has validated the use of eHAB for assessing physical outcomes including range of movement, muscular strength testing and functional task evaluation. The system has been shown to be valid and reliable in assessments of stroke patients, as well as those with Parkinson’s disease. We will demonstrate how the eHAB system can be used to conduct assessments of lymphoedema to aid early diagnosis, and improve long-term management. In particular, we propose that health professionals could use eHAB to measure patients for compression garments, assess the fit of compression, assess limb function and range of movement, teach and observe exercises, demonstrate self-massage techniques, and to provide patient education.

The Rekindle Study: an Australian randomised phase II study assessing feasibility of an online intervention to promote sexual wellbeing for both cancer survivors and their partners

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Background

Many people diagnosed with cancer experience changes in sexual function due to disease and/or side effects of treatment. Long-term sexual changes can lead to psychological distress and reduced quality of life for survivors and partners. We developed Rekindle, a web-based psycho-educational intervention, to provide accessible, tailored psychosexual support to cancer survivors.

Objectives: to determine acceptability, feasibility, and usability of the rekindle program

Methods (including type of data collected)

The Rekindle study is a 3-arm phase II randomised control trial conducted over six months. Treatment groups: Rekindle, Rekindle Plus (self-led plus 3 navigational support calls) and Attention Control. The Rekindle intervention incorporates seven evidence-based modules empowering users to manage sexual changes, content is delivered via the internet as written information, video, tutorials, and exercises. Two modules are mandatory and five tailored to user’s sexual concerns. Rekindle is tailored to gender, patient/partner, single/partnered, and sexual preference requiring a total of 12 versions of materials, all subject to individualised prescription of modules. Attention control participants are provided written information via the internet during the first 10 weeks, then given access to Rekindle.

The primary outcome is percentage of prescribed modules completed and the secondary aim is to improve sexual satisfaction measured by PROMIS sexual satisfaction scale. 170 adult cancer survivors who completed primary cancer treatment 6-months prior to enrolment and/or their partners who identify at least one psychosexual unmet need are being recruited.

Results: To date 86 people have been randomised; participant age ranges from 22 to 80 years, 62% are men, 91% had cancer themselves, 72% are in a relationship, and 96% identify as heterosexual. Participants have enrolled from across the country, with 60% from major cities, 23% inner regional areas, 14% outer regions, and 1% very remote.

Conclusions: Rekindle enrolment to date highlights the extent of psychosexual unmet needs in Australian cancer survivors. Online strategies are encouraging.

Outcomes of the iCanADAPT Program: an internet-based CBT program for depression and anxiety in early stage cancer and cancer survivors

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Finding My Way: A Web-Based Psychosocial Intervention For Cancer Related Distress - An Outcomes Analysis Of A Multicentre RCT.

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Background: Online self-help holds promise for overcoming access barriers to conventional therapist-administered psychosocial interventions. We have undertaken a multi-site RCT of a 6-module/8-week internet Cognitive Behaviour Therapy-based support program aiming to reduce cancer-related distress and improve coping (Finding My Way), with the primary objective of evaluating the program's efficacy and secondary objectives of examining program uptake, satisfaction and adherence.

Methods: Cancer patients treated with curative intent (n=191) were recruited from October 2013 to November 2015, and randomised to receive either the Finding My Way intervention or an attention-control. Measures of cancer-related distress, general distress, health related quality of life, coping, and health service usage were administered at baseline, post-intervention, then 3-months and 6-months later. Changes over time between groups were analysed using Mixed Models for Repeated Measures, using baseline scores as covariates.

Results: Of 461 eligible patients, 191 (41%) enrolled; 31% eligible breast cancer patients declined vs 55% eligible melanoma patients. The most common reasons for declining included the patient was coping well enough (23%), or not having time (17%). Enrolled participants (mean age 55.0 years, range 26-95) were predominantly female (84%), partnered (77%), breast cancer patients (63%), and were predominantly tertiary educated (71%) and employed (63%). Of note, 31% of the sample lived in rural or remote areas. While participant adherence overall was moderate-to-high, significant differences between groups emerged, with the control group completing more modules (M=4.45, SD=2.11) than intervention participants (M=3.29, SD=2.25; t(189)=3.70, p<.001). Post-treatment feedback indicated that 82% of respondents found the program quite/very helpful. Follow-up data collection was finalised in July 2016, and intervention-efficacy for all waves of data will be presented.

Conclusion: This study demonstrates the promise of web-based CBT for increasing the reach of psychological therapies. Clinical and research implications of this efficacy findings will be discussed. Funding: NHMRC Project Grant #1042942.

PROMPT-Care: An eHealth decision-support system utilising patient reported outcomes to support patient-centred care and self-management

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8. Didymo Designs, Wollongong
9. Cancer Institute NSW, Sydney

Background: Patient reported outcomes (PROs) are increasingly important in patient-centred care, but widespread collection does not occur.

Aims: To develop, implement and evaluate feasibility and acceptability of an eHealth decision-support system, PROMPT-Care, which facilitates a) PRO data capture, b) data linkage and retrieval to support clinical decisions and patient self-management, and c) data retrieval for ongoing evaluation and innovative research.

Methods: a) The PROMPT-Care eHealth system was developed, b) patient reported outcomes were selected, c) algorithms to inform intervention thresholds for self- and clinical-management were determined, d) clinician PRO feedback summary and longitudinal reports were designed, e) patient self-management resources were collated, f) PROsaia, a custom IT system will transfer PRO data in real-time into the hospital-based oncology information system, to support clinical decision-making, and g) the PROMPT-Care system feasibility and acceptability assessment were undertaken.
Imaging is of pre-operative planning assistance, for identifying location.

Available Imaging techniques are typically ultrasound and MRI (Magnetic Resonance Imaging) monitoring of implant integrity and evaluation of symptoms is both clinical and radiological.

The choice of implant, size, technique of placement, and type of implant and volume of breast tissue are important factors impacting on this.

Breast augmentation with implant placement is becoming more common place.

Implants and MRI assessment

Michelle Reintals

Breast augmentation with implant placement is becoming more common place with post partial and full mastectomy reconstruction techniques and for cosmetic purposes.

The choice of implant, size, technique of surgery is multifactorial, and predominately a clinical based decision.

Monitoring of implant integrity and evaluation of symptoms is both clinical and radiological.

Available Imaging techniques are typically ultrasound and MRI (Magnetic Resonance Imaging), and allow for evaluation of implant integrity, namely rupture of either extra or intra capsular type, silicone adenopathy and peri-implant fluid.

Imaging is of pre-operative planning assistance, for identifying location and type of implant and volume of implant.

Results: Overall, 35 patients completed 67 PROMPT-Care assessments, evaluation surveys (n=28), evaluation (n=14) and cognitive (n=10) interviews. Five oncology staff were also interviewed to explore usability of the system. All patients found the system easy to use, reported the time to complete online assessments (mean 15 min) as “about right” and were willing to answer more questions. Patients valued the self-management resources “… those types of sites [resources] and all the information encouraged me… you realise you got to do these things if you want to get better”. Oncology staff reported high acceptability and feasibility “I would have an impression about a patient, that things weren’t going fantastically, but it [reports] gave greater granularity and specificity about where the needs were”.

Conclusion: The PROMPT-Care system is feasible and acceptable and will be implemented as routine care in South Western Sydney and Illawarra Shoalhaven LHDs in 2017. Barriers to facilitating large-scale implementation into clinical practice can be addressed.

When to do what: optimizing decisions and outcomes from breast surgery

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One of the best ways to improve the outcomes of women who present with large tumors, and where mastectomy and radiation and systemic chemotherapy would be needed, is to start with systemic therapy and avoid surgical resection first. Most women will have a response to therapy that is sufficient to avoid mastectomy. This is the ideal outcome if radiation is required. The local recurrence outcomes are not increased in this situation as the key risk for women with more aggressive disease at presentation is distant not local recurrence. Over half of these women may not need to have a mastectomy. Techniques such as breast reduction in a woman with sufficiently large volume of breast tissue can also eliminate the need to mastectomy and is associated with improved satisfaction relative to mastectomy and fewer complications.

For women who undergo mastectomy, the optimal cosmetic outcome is achieved with total skin sparing techniques and immediate reconstruction. Outcomes have improved over time. The ability to save the entire skin envelope is feasible and oncologically safe. The addition of fat grafting has led to significant improvement in cosmesis. Reduction in complications has resulted from staged reconstructions and use of prepectoral implants for women with larger and smaller skin envelopes, respectively. There is significant controversy over the use of antibiotics and ongoing studies may provide the definitive answer to whether prolonged use of prophylactic antibiotics in the post operative setting increases the chance of complications by predisposing to resistant organisms or actually prevents infections that lead to implant loss. Use of incisional wound vats are being tested for their ability to prevent complications in situations where risk of wound breakdown is increased.

For women who undergo either reduction mammoplasty or mastectomy, surgeons should be aware that postmastectomy pain, is not an infrequent complication. It is likely caused by the cauterization of the vessel that accompanies that egress of the T4 and T5 intercostal nerve branches from the chest wall into the breast at the lateral (3/9 o’clock) and inferior (6 o’clock) positions.
**Conclusions:**

P < 0.000), (Intervention group change score 1.28, P score 0.41, P< 0.049). At 8 weeks the intervention group were also more likely to report communication with their family members. At 8 weeks (n=144) the intervention group were significantly more likely than the control group to have documented their wishes communicating with their oncologists regarding their wishes for future care and 114 (54.5%) reported communicating with oncologists compared to 45 in the control group (P < 0.000). Communication with oncologists increased to 47.8% in the ACP group, compared to 20.0% in the control group (P < 0.000).

**Results:**

Differences between groups at 8 weeks and change scores between time points, are reported.

**Methods:** The iPad tool (CANCIST), incorporated a horizontal DT, four items on psychological distress (from the PHQ-4), two on fatigue, and four covering unmet needs. The tool was trialled across 221 haematology adult patients (70% with malignancies, 30% non-malignant conditions) attending a hospital-based cancer care centre. Psychological distress and fatigue was validated using the Brief Symptom Inventory (BSI-18) and the Fatigue Symptom Inventory (FSI) respectively. A brief questionnaire assessed acceptance and ease of use, and measures of completion time were recorded.

**Results:** There was no statistically significant difference in distress between the malignant and non-malignant haematology subgroups. The sensitivities and specificities were high: psychological distress (.86 and .80) and fatigue (.80 and .74). The horizontal DT weighted more heavily on psychological distress rather than fatigue. Participants reported high useability of this tool, with 93% responding very easy to use, and 94% responding to definitely using again. The mean time of completion was 108 seconds (SD = 49 seconds).

**Conclusions:** The CANCIST iPad tool is a reliable, brief, easy to use tool with high acceptance from participants, for psychological distress and fatigue screening, with useful sensitivities and specificities across the haematological cohort. Further validation in the general oncology population is needed.

**A validated e-tablet based brief screening tool for psychological distress and fatigue in haematology patients**

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3. Nepean Cancer Care Centre, Nepean Hospital, Kingswood, NSW, Australia

**Background and aim:** The negative impact of distress related conditions on cancer patients is well recognised, and brief screening tools i.e. the distress thermometer (DT), validated on cancer patients, have been developed. This study presents a validated e-tablet (iPad) tool based on a haematology cohort, covering a spectrum of malignant and non-malignant conditions. The tool was designed to distinguish psychological distress from fatigue targeted follow-up, and to use touch-screen technology in line with research in effective screening implementations.

**Method:** The iPad tool (CANCIST) incorporated a horizontal DT, four items on psychological distress (from the PHQ-4), two on fatigue, and four covering unmet needs. The tool was trialled across 221 haematology adult patients (70% with malignancies, 30% non-malignant conditions) attending a hospital-based cancer care centre. Psychological distress and fatigue was validated using the Brief Symptom Inventory (BSI-18) and the Fatigue Symptom Inventory (FSI) respectively. A brief questionnaire assessed acceptance and ease of use, and measures of completion time were recorded.

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**Conclusions:** The CANCIST iPad tool is a reliable, brief, easy to use tool with high acceptance from participants, for psychological distress and fatigue screening, with useful sensitivities and specificities across the haematological cohort. Further validation in the general oncology population is needed.

**Advance care planning increases communication between cancer patients, their oncologists and their family: an RCT**

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3. Austin Health, Heidelberg, Victoria
4. The Royal North Shore Hospital, Sydney, NSW

**Aims:** To measure the impact of an advance care planning intervention (ACP) on communication about end of life care (EOLC) with healthcare professionals and family, in patients with incurable cancer.

**Methods:** 209 patients with advanced cancer and an expected survival of 3-12 months, as well as their nominated family or friend, were randomised to receive usual care or usual care plus ACP. Communication with healthcare providers and family members was assessed by questionnaire at baseline and 8 weeks (6 weeks post-intervention) using a 5-point likert scale (‘Not at all’ to ‘Very much’ discussion). Participants were asked “have you made any decisions regarding the types of medical treatments you would wish to receive if you are very sick?” and “have you written these wishes down in a formal way?”.

**Statistical methods:** Univariate analysis using chi-squared tests for categorical outcomes and independent t-tests for continuous outcomes. Differences between groups at 8 weeks and change scores between time points, are reported.

**Results:** At baseline 15 (7%) participants had formally documented their wishes for future care. Only 52 (26.1%) participants reported communicating with their oncologists regarding their wishes for future care and 114 (54.5%) reported communicating with their family members. At 8 weeks (n=144) the intervention group were significantly more likely than the control group to have documented their wishes (64.2% vs 13%, P< 0.000). Communication with oncologists increased to 47.8% in the ACP group, compared to 27.3% in control (P <0.011) (Intervention group change score 0.41, P< 0.049). At 8 weeks the intervention group were also more likely to report communication with their family members (92.4% vs 68.8%, P< 0.000), (Intervention group change score 1.28, P < 0.000).

**Conclusions:** The intervention increased documentation of patient’s wishes for EOLC and increased communication with oncologists and family.
Routine screening and management of anxiety and depression in adult cancer patients: Development of an on-line communication skills education program for health professionals

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Aims: Screening for anxiety/depression occurs inconsistently in Australia and there is a gap in care once identified. The Psycho-oncology Co-operative Research Group (PoCoG) have developed an evidence-based clinical pathway for the identification and management of anxiety/ depression in adult cancer patients to facilitate implementation of routine screening. Ensuring frontline clinical staff have the knowledge and confidence to facilitate patient uptake of support. The aim of this research was to develop an interactive on-line education program aimed at increasing knowledge, improving communication and confidence when communicating about anxiety and depression screening and referral.

Methods: The educational content of the training program was informed by oncology and communication literature. The theoretically derived Comskil model directed the communication components. Adult education learning principles were used to direct learning activities. Clinical scenarios, self-reflection exercises and clinical guidance were incorporated to facilitate clinical relevance. Development involved an iterative research design. Stakeholder feedback (n=6) on acceptability, relevance and clinical applicability was sought throughout development.

Results: Five key themes, identified through the literature and stakeholder feedback informed module development: (1) understanding anxiety/depression in the cancer context, (2) tailoring the clinical pathway locally, (3) initiating a conversation with a patient about screening, (4) making a referral and (5) dealing with challenging conversations. Stakeholder feedback overall was positive with respect to content and design. Suggestions such as the inclusion of clinical staff testimonials and inclusion of downloadable resources were included in the final design.

Conclusions: Building workforce skills, knowledge and confidence is crucial for the successful implementation of routine screening in busy cancer settings. This interactive on-line training provides strategies and communication skills for front-line staff to guide these important conversations. The training program will be piloted as part of a larger program of work to support and evaluate the implementation of the clinical pathway across NSW.

Impact of a 12-week online-instructed exercise program in men with breast cancer: Preliminary results of the BRECA-Male-Study

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2. Institute for Health and Ageing, Australian Catholic University, Melbourne, VICTORIA, Australia
3. Exercise Medicine Research Institute, Edith Cowan University, Joondalup, Western Australia, Australia

Aims: Breast cancer is 100 times more common in women than in men, yet the disease burden is similar. A growing body of evidence suggests that exercise can improve physical and mental health outcomes in breast cancer patients, however studies in male breast cancer patients are lacking. The aim of this randomized controlled pilot study was to explore the impact of an home-based, online-instructed exercise program on fatigue and health-related quality of life in men with breast cancer.

Methods: 23 men with breast cancer (mean age 59.5 ± 9.1 years; BMI 26.8 ± 4.4) participated in a 12-week home-based, online-instructed aerobic and resistance exercise program three 30min. sessions/week. Patients were randomly assigned to Group A, exercising at 40-50% of their maximal heart rate (HRmax) or Group B, exercising at 70-80% HRmax. Patients completed the Multidimensional Fatigue Inventory (MFI-20) and the Ageing Males’ Symptoms rating scale (AMS) at baseline and after the intervention. Data was analyzed using the Mann-Whitney U-Test and the Wilcoxon Test.

Results: 18 patients completed the intervention, while five patients withdrew from the study. The change over time in MFI-Physical fatigue differed significantly between groups (Group A: -1.75 vs. Group B: 0.30; p =0.034), however a between-group difference existed at baseline (p=0.043). An exploratory analysis of the within-group changes revealed significant improvements in MFI-Physical fatigue and MFI-Reduced activity (p=0.031 and 0.042, respectively) in Group A as well as a positive trend in the somatic and psychological subscale of the AMS (p=0.073 and 0.062, respectively).

Conclusions: To our knowledge this is the first randomized controlled exercise intervention trial in male breast cancer patients. A home-based, online-instructed exercise program seems feasible for men with breast cancer however larger trials are necessary to examine the impact of exercise on physical and mental health outcomes.
Breast and ovarian cancer prevention: is it time for population-based genetic testing for BRCA mutations?

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Background and Aims:
Germline mutations in BRCA1 and BRCA2 confer high lifetime risk of breast and ovarian cancer but importantly these risks are not irreversible. Identification of asymptomatic carriers could significantly reduce the incidence of these diseases. The traditional model of familial cancer practice involves ascertaining high-risk individuals based on family history but >50% of women who carry a BRCA1/2 mutation may not have a family history of cancer. Momentum toward genetic screening of the asymptomatic population is growing but it remains unclear what is the true frequency of actionable mutations in the general western population and the extent to which the public would accept such screening, particularly for those individuals identified with an actionable mutation in the absence of an overt family history.

Methods:
We are sequencing the entire coding regions of 20 known or proposed HBOC genes in 5,000 cancer survivors with clinically significant fear of cancer recurrence (FCR) in the absence of an overt family history.

Results:
Of 305 eligible and contactable patients, 222 agreed and were randomized. The groups were well matched at baseline. Participants were on average 52 years old (SD=10.1), 28 months since treatment completion, and 95% had breast cancer (84%). At post-treatment, intervention group participants reported an 18.1-point decrease in total FCR compared to a 7.6-point decrease in control participants (p=0.003, 95% CI -16.1, -4.9; Cohen’s d=0.44, range 0-168) and a 4.7-point decrease in the FCR severity subscale compared to a 2.4-point decrease in controls (p<0.01, 95% CI -3.7, -1.0; Cohen’s d=0.40, range 0-36). Results for secondary outcomes and adjusted analyses will be presented.

Conclusions:
This evidence-based psychological intervention was effective in reducing FCR in cancer survivors compared to a control treatment. The next steps will be to assess formats to increase accessibility and cost-effectivity.

The development of personalised diagnostic tests and therapeutic strategies in breast cancer

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Despite some improvement in the overall survival rates of breast cancer, it remains the second most common cause of cancer related deaths in Australia. Currently we are unable to accurately predict patients’ response to therapies and their long-term outcome. We developed and patented a gene signature that can predict which patients suffer from aggressive disease and succumb to their disease within 5 years of diagnosis. This test, the integrated Breast Cancer Recurrence score (iBCR), can also predict which emerging targeted therapies should be added to standard treatments
Breast cancer and metastasis: New insights into cell death pathways

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Metastasis spread is a multiple step process, and cell death is a major obstacle for a potential metastatic cell. Whereas large numbers of cells from a primary tumour may gain access to the circulation, few of them will give rise to metastases. The mechanism of elimination of these tumour cells, often termed ‘metastatic inefficiency’ is poorly understood. It is known that the overexpression of anti-apoptotic proteins of the BCL-2 family plays a key role in the pathogenesis of many solid tumours. Studies of various cancers have reported a link between BCL-2 family members and outcomes for patients. It will be important to determine which of these proteins may be involved in the survival of metastasis.

Using the transgenic PyMT model and metaplastic human tumours, we recently reported that the pro-apoptotic protein BIM is upregulated at the tumour border, and act as a metastasis suppressor in breast cancer (Merino, Best et al., Oncogene 2015). The relevance of this finding in human disease, and the identification of other cell death mediators in this process will require more work using patient derived xenografts (PDX). Our laboratory generated an extensive bank of breast tumour xenografts that include ER-positive, HER2-positive, and triple negative tumours, which lack ER, progesterone receptor (PR), and HER2 expression. We have previously shown that these PDXs recapitulate features of primary tumours, and can be used as pre-clinical models to evaluate the efficacy of new drug combinations including chemotherapy, endocrine therapy and BH3 mimetics (Vaillant, Merino et al., Cancer Cell 2013). More recently, we characterized the ability of these PDXs to metastasize in NSG mice, and perform RNAseq analysis in circulating tumour cells (Unpublished). These models are useful not only to understand how breast cancer spreads, but also to favour the development of treatment for advanced disease.

Uptake of adjuvant breast cancer treatments recommended by Multi-Disciplinary Meetings

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Background and aim

Adjuvant therapy for breast cancer is routinely discussed and recommended in multidisciplinary meetings (MDMs). Current literature explores how treatments received by patients differ from national guidelines. Treatment received is a combination of a treatment being recommended and a patient following the recommendation. The latter aspect has received little attention. This study investigates the concordance between MDM recommendations and treatment actually received.

Methods

A retrospective cohort study of patients diagnosed with breast cancer at Royal Melbourne Hospital in 2010 and 2014 was conducted. Patient information was collected from medical records. Concordance was defined as initial receipt of treatment e.g. attending a radiotherapy/chemotherapy appointment or accepting a script for endocrine therapy. Compliance during treatment regime was not considered.

Results

382 patients were included in the study (151 from 2010, 231 from 2014). Overall, concordance between recommended and received treatment was 85% (CI 82%-88%). It was highest for chemotherapy (Cohen's Kappa k=85% CI 79%-92%), followed by endocrine therapy (k=79% CI 77%-82%) and radiotherapy (k=79% CI 75%-83%). There were no significant differences in concordance between those diagnosed in 2010 as compared to 2014, however there were significant changes in treatment recommendations, including a significant decrease in recommendations for radiotherapy (74% vs 62% p=0.0115). For the patients for whom suitable information was available, non-concordance with recommendations was commonly due to a change of surgical treatment, patient comorbidities or patient choice. There were also a large number of unknown reasons for non-concordance, particularly for chemotherapy and endocrine therapy.

Conclusions

Although uptake of MDM recommended treatments is high, there is a minority of patients in whom MDM recommendations are not followed for a variety of reasons. More attention to this group and the reasons for non-concordance warrant further study.

Feasibility of ”prehabilitation” in men with prostate cancer undergoing prostatectomy.

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We have confirmed the prognostic power of the iBCR, irrespective of clinicopathological features, in a pilot study using the NanoString nCounter Dx platform by measuring the expression of the top 125 genes within the signature in a cohort of 48 patients from the Queensland Follow Up (QFU) cohort with 25 years of follow up (p<0.0001). Future work will expand this test to the full 275-gene set across 500 patients from the QFU cohort. In vitro siRNA screening of the 21 novel genes revealed that at least 10 of these genes are required for breast cancer cell survival. We have started validation of the top 4 hits and these studies confirm the requirement of these genes in breast cancer progression. These data will pave the way towards the study of these genes as new drug targets. Collectively, our test addresses the significant issue of heterogeneous responses to breast cancer treatment. The iBCR platform aims to improve both patients’ clinical outcome and quality of life by directing more appropriate treatment with greater likelihood of success, and preventing overtreatment for those with a less aggressive tumor type.
CDK4/6 inhibition in breast cancer: the late harvest cycle begins

Shom Goel
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Therapies that modulate estrogen receptor-α (ER) action have improved the survival of patients with ER-positive breast cancer, but resistance to treatment is a major clinical problem. Therefore the targeting of alternative/parallel signalling pathways is required to improve the efficacy and benefit of currently available treatments. Emerging data have shown that other sex hormone receptors may regulate the sites at which ER binds to DNA to suppress the oncogenic activity of ER in breast cancer. The ER, progesterone receptor (PR) and androgen receptor (AR) are ligand-activated transcription factors that bind DNA and interact with a host of other nuclear proteins to regulate gene expression. The cognate hormones and their receptors are structurally and functionally related. Progesterone is a precursor hormone for androgen, which is converted to estrogen; ERα is the prototype from which AR and then PR evolved. Our recent findings indicate that cross-talk between PR or AR with ER in breast cancer can influence response to ER-target therapies and disease outcomes. We recently showed that the PR can reprogram the ER DNA binding landscape towards genes associated with a favourable outcome. Similarly, the AR, which is expressed in the majority of breast cancers, can reprogram ER DNA binding to inhibit the growth of ER-positive tumours. All three receptors have historically been targeted in the treatment of breast cancer, with a wide range of old and new generation drugs available, offering the opportunity for drug re-purposing and a faster track to clinical translation compared to new drugs that require extensive clinical evaluation. Despite the potential benefit of targeting PR or AR in ER-positive breast cancer, uncertainties remain. For example, there is debate on what PR or AR ligands would be most beneficial in treating women with ER-positive disease. Moreover, AR antagonists as well as selective androgen receptor modulators (SARMs) that activate AR in breast cancer cells are currently being evaluated as potential therapeutic strategies. These issues highlight ongoing uncertainty regarding the best approach to target PR or AR in ER-positive disease. It is therefore critical that the mechanisms of crosstalk between ER and PR or AR be fully elucidated and the effect on reprogramming of ER tested in optimal preclinical models to better inform the design of clinical trials. Additionally, biomarkers of response to PR and AR target therapies need to be established to facilitate introduction of these adjunct ER target therapies into clinical practice.

Targeting progesterone and androgen receptors to enhance ER-target therapies in breast cancer

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Therapies that modulate estrogen receptor-α (ER) action have improved the survival of patients with ER-positive breast cancer, but resistance to treatment is a major clinical problem. Therefore the targeting of alternative/parallel signalling pathways is required to improve the efficacy and benefit of currently available treatments. Emerging data have shown that other sex hormone receptors may regulate the sites at which ER binds to DNA to suppress the oncogenic activity of ER in breast cancer. The ER, progesterone receptor (PR) and androgen receptor (AR) are ligand-activated transcription factors that bind DNA and interact with a host of other nuclear proteins to regulate gene expression. The cognate hormones and their receptors are structurally and functionally related. Progesterone is a precursor hormone for androgen, which is converted to estrogen; ERα is the prototype from which AR and then PR evolved. Our recent findings indicate that cross-talk between PR or AR with ER in breast cancer can influence response to ER-target therapies and disease outcomes. We recently showed that the PR can reprogram the ER DNA binding landscape towards genes associated with a favourable outcome. Similarly, the AR, which is expressed in the majority of breast cancers, can reprogram ER DNA binding to inhibit the growth of ER-positive tumours. All three receptors have historically been targeted in the treatment of breast cancer, with a wide range of old and new generation drugs available, offering the opportunity for drug re-purposing and a faster track to clinical translation compared to new drugs that require extensive clinical evaluation. Despite the potential benefit of targeting PR or AR in ER-positive breast cancer, uncertainties remain. For example, there is debate on what PR or AR ligands would be most beneficial in treating women with ER-positive disease. Moreover, AR antagonists as well as selective androgen receptor modulators (SARMs) that activate AR in breast cancer cells are currently being evaluated as potential therapeutic strategies. These issues highlight ongoing uncertainty regarding the best approach to target PR or AR in ER-positive disease. It is therefore critical that the mechanisms of crosstalk between ER and PR or AR be fully elucidated and the effect on reprogramming of ER tested in optimal preclinical models to better inform the design of clinical trials. Additionally, biomarkers of response to PR and AR target therapies need to be established to facilitate introduction of these adjunct ER target therapies into clinical practice.

RANK Ligand as a Target for Breast Cancer Prevention in BRCA1 Mutation Carriers

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Background: BRCA1 mutation carriers commonly undergo prophylactic mastectomy to reduce their risk of breast cancer. The identification of an effective and acceptable prevention strategy remains a ‘holy grail’ for the field. Precancerous BRCA1+ tumour tissue contains an aberrant population of progenitor cells and deregulated progesterone signalling has been implicated in BRCA1-associated oncogenesis. Since Receptor Activator of Nuclear Factor-kappa B ligand (RANKL) is a key paracrine effector of progesterone signalling, and RANKL and its receptor RANK contribute to mammary tumorigenesis, we investigated a role for this pathway in preneoplastic breast tissue from BRCA1 mutation carriers.

Methods: Freshly isolated, histologically normal patient specimens from BRCA1 mutation carriers were studied using a variety of assays. RANK expression was evaluated in formalin fixed paraffin embedded archival sections from the kConFab and the Ameen Tissue Banks with HREC approval. The MMTT-cre/Bra1-1ip53− mouse model was used to investigate RANKL inhibition as a chemoprevention strategy.

Results: We identified two subsets of luminal progenitors (RANK+ and RANK−) in histologically normal tissue of BRCA1 mutation carriers. RANK+ cells were highly proliferative, expressed grossly aberrant DNA repair and bore a molecular signature similar to that of basal-like breast cancer. Moreover, high levels of RANK expression prevailed in established BRCA1-associated tumours. These data suggest that RANK+ and not RANK− progenitors are a key target population in these women. Notably, inhibition of RANKL signalling by denosumab in 3D breast organoids
derived from pre-neoplastic BRCA1+/− tissue attenuated progesterone-induced proliferation. Furthermore, inhibition of RANKL with either the RANKL inhibitor OPG-Fc or a RANKL monoclonal antibody in a Brca1-deficient mouse model significantly curtailed mammary tumorigenesis, when compared to controls (p<0.001).

Conclusions: Together these findings identify a targetable pathway in a putative cell of origin population in BRCA1 mutation carriers and implicate RANKL blockade as a promising breast cancer prevention strategy.

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Breast Cancer in seniors

Jasotha Sanmugarajah

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Cancer is a disease of aging. The proportion of older patients with cancer is expected to grow in the next few decades. More than half of all cancers are diagnosed in patients over 65 years. An average 65 –year-old patient has an anticipated life expectancy of 20 years. About 25% of breast cancer occurs in patients over 70 years. Diagnosis, treatment options and challenges of adjuvant treatment, role of geriatric assessment in senior patients will be discussed.

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Riding the Silver Tsunami at the Gold Coast University Hospital

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Aims:
With a growing number of elderly cancer patients at the Gold Coast University Hospital and recommendations from the International Society of Geriatric Oncology that comprehensive geriatric assessment (CGA) can improve function and reduce hospitalisation in the elderly a Senior Medical Oncology clinic was developed 1.

Methods:
A comprehensive literature search was undertaken of geriatric oncology tools and comprehensive geriatric assessments to develop our own comprehensive geriatric assessment tool.

Results:
A dedicated multidisciplinary Senior Medical Oncology clinic was formed in June 2015 with two Medical Oncologists, Oncology Registrar. Cancer Nurse Consultant, Pharmacist and Oncology Dietician. The clinic has reviewed 1-2 patients per week since the clinic’s inception. All patients are currently screened via phone prior to their appointment. Strict timetables ensure that patients are seen on time and within an appropriate time frame. The CGA takes an hour to undertake followed by 20min multidisciplinary meeting, followed by 15min oncology consultant review.

Conclusions:
The Senior Medical Oncology clinic has a cohesive team working towards providing patient centred and safe treatment options for patients over 80. Patients are referred to appropriate allied health and/or supportive care services where indicated within the CGA. We continue to strive towards ensuring that our geriatric oncology model is one that can be replicated elsewhere in Australia. A satisfaction survey for the patients and their families to validate the clinic is planned.


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It’s all in the detail: medication conundrums in the older cancer patient

Michael Powell

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With the fastest growing segment of population in Western countries including Australia being composed of individuals over the age of 65 years, and significant growth in cancer incidence and prevalence as a result, the evolving field of geriatric oncology represents an important area for new approaches to thinking in order to best personalise care for these patients. Incorporating geriatric assessment and management into the care of the older cancer patient has been shown to be feasible and mounting data supports the implementation of targeted geriatric care into everyday clinical oncology practice.

It is widely acknowledged that polypharmacy and the use of potentially inappropriate medications (PIMs) is more common in the older patient and represents a critical component of geriatric evaluation. Studies have demonstrated that PIM use has been associated with an increase in adverse drug events, hospitalisation and mortality. An important aspect of geriatric assessment and management therefore should involve thorough medication history taking, evaluation and where appropriate rationalisation in an effort to minimise the risk of both adverse events and drug interactions in a group of patients particularly vulnerable to their effects, especially when combined with systemic anti-cancer therapy.

This presentation aims to provide a brief overview of the main medication-related issues experienced by older cancer patients and outlines current and emerging evidence on how best to manage these medication conundrums.

Radiation therapy in older patients with early breast cancer

Claire Phillips
1. Peter MacCallum Cancer Centre, East Melbourne, VIC, Australia

Adjuvant radiotherapy after breast conserving surgery or mastectomy has an established role in the treatment of early stage invasive breast cancer. It improves quality of life by maximising local control and improves overall survival. In older patients however the risk of death from other causes is such that a survival benefit is not always present. The risk of local failure is very low for Stage 1 Luminal A disease but can be high for all breast cancer phenotypes, depending on T and N stage. Breast radiotherapy is generally well tolerated by older patients although fatigue may be significant. Careful consideration must be given to the individual patient’s performance status, medical co-morbidities and personal wishes, as well as to the estimated recurrence risk of that individual’s tumour, in order minimise the potential for unnecessary treatment but equally to avoid under treatment of higher risk disease simply because of the patient’s age.

Managing menopause in breast cancer

Deborah Fenlon
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Menopause is intimately connected to ageing in women. Where men expect a gradual change as they age, women anticipate an abrupt loss of hormones that heralds sudden changes to how they look and feel, with a loss of status as they feel their physical attraction decline. Breast cancer treatment can accelerate this change, which is frequently unexpected. Women expect potentially disfiguring surgery, hair loss and nausea through chemotherapy, and soreness and fatigue through radiotherapy, but menopausal problems, such as hot flushes and dry vagina, may not be expected and can be both troubling and long lasting. 70% women have menopausal difficulties after breast cancer, of whom 95% have hot flushes. These can last more than five years in a third of women. Most of those with hot flushes also have night sweats and disturbed sleep, with 72% women experiencing hot flushes also recording disturbed sleep. Worriedly, in one survey 30% women said they had considered stopping taking adjuvant hormone therapy because of their hot flushes. It is known that only 50% women adhere to a full five years of adjuvant hormone therapy, resulting in a 30% increase in breast cancer mortality. In the UK, the National Cancer Research Institute Clinical Studies Group for breast cancer has set up a sub group to stimulate new research into this area. This presentation will share some of the UK current thinking and research around managing menopause in women who have had breast cancer.

Current surgical trials for the management of regional node disease

Bruce Mann
1. Victorian Comprehensive Cancer Care, Parkville, VIC, Australia

Management of regional nodal disease for invasive breast cancer used to be very simple. All patients were recommended an axillary node dissection as it was considered therapeutic, it was prognostic and guided recommendations for adjuvant therapy, and contributed to locoregional control. Developments in imaging and early diagnosis, surgical techniques, radiation and medical oncology, and understanding of tumour biology have challenged this simple algorithm. Trials have suggested that less extensive surgery leads to equivalent outcomes, while others suggest that more extensive radiotherapy may have advantages. The most common clinical question facing the breast surgeon is whether to recommend further axillary treatment for a patient with limited disease in the sentinel node. A further question is whether to recommend any axillary surgery in certain low risk patients. These are subjects of current surgical trials that will be reviewed in this presentation.

Regional nodal radiation therapy (rt) in early stage breast cancer

Sue Pendlebury
1. St Vincent’s Hospital, Sydney, Sydney, NSW, Australia

The Early Breast Cancer Trialists Collaborative Group (EBCTCG) publication, 2005 confirmed that RT not only reduces local recurrence, but also confers a survival advantage. That publication shows one additional survivor at 20 years for every 1.5 first recurrences prevented at 10 years. RT roughly halves first recurrence proportionately with a resulting reduction in mortality of 15%. The absolute reduction in breast cancer mortality at 20 years was 7.9% in women with 1-3 positive nodes and the relative risk of dying from breast cancer was 0.90 (95% CI 0.67 to 0.95; P=0.01) with similar results for patients with 4 or more nodes positive. Two randomized trials published in 2015, one from EORTC and the other MA.20 study demonstrated advantages for patients who underwent regional nodal irradiation. In general the patients in these trials had fewer than 4 nodes involved. In MA.20 LLR improved from 92.2%-95.2% at 10 years (P=0.009); and DFS improved from 77%-82% at 5 years. Both studies addressed...
Regional node recurrence: Challenges for the Patient and the Doctor

John Boyages
1. Macquarie University, North Ryde, NSW, Australia

Recurrences in regional nodes following treatment of breast cancer are not uncommon and can be associated with significant psychological and physical morbidity. Recurrence can occur late, particularly for ER positive tumours. Hellman (1994) stated that breast cancer is probably a spectrum disease and challenged the notion that the disease is simply local (Halstedian hypothesis), or simply metastatic at presentation (Fisher hypothesis) and noted that regional disease may be the only site of metastasis in many patients.

In the landmark NSABP-B06 study regional recurrence occurred in 4.6% of patients undergoing a total mastectomy, 8.7% for patients undergoing a lumpectomy and 5.4% for patients undergoing lumpectomy and radiation. Of these, 26%, 30% and 38% occurred after 5-years and 9%, 10% and 15% occurred after 10 years. In the Oxford overview of breast conservation trials, of patients who had lumpectomy alone 35.4% had regional recurrence after 5 years and 5.9% after 10 years.

The treatment of regional node recurrence is complex and should be managed by a multidisciplinary team. Taking a "palliative" approach and simply treating the patient with chemotherapy on the assumption that the disease is "recurrent" or "metastatic" can result in significant under-treatment and the loss of the possibility of cure.

In this presentation, several examples of difficult recurrences that have been treated aggressively with chemotherapy, followed by surgery and then by radiation therapy will be presented, including recurrences in the axilla, interpectoral space (Rotter's node), internal mammary chain and the opposite axilla.

Treatment of regional node disease can result in long-term remissions and probably "cures" for some patients. Potential under-treatment of the axilla with observation of isolated tumour cells and micrometastases, particularly in patients with mastectomy, may lead to an increased recognition of this problem in the next few years with physical, psychological and potential medicolegal implications.

Using mammographic images to predict risk and masking of breast cancer

John Hopper
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There is information in a mammogram that does more than reveal likely existing tumours – and that information predicts future tumours (breast cancer), and/or tumours likely to be missed at screening (masking). It has been referred to as mammographic density and breast density. The challenge is how to get the best predictors (of inherent risk, of interval cancers and of masking) and how to translate this into clinical and population health practice so as to lower the impact of breast cancer. Digital mammography and other screening modalities open new opportunities, especially when combined with sophisticated computer algorithms. Just as blood pressure studies made a major impact on ameliorating the impact of cardiovascular and heart disease by being a measurable biomarker with predictive value, the same could be done for breast cancer. I will highlight some of the major issues and recent findings. First, what is mammographic density, and what is breast density, and how do they differ? Second, can we obtain measures of risk at a young age that open the door for early life interventions and better screening protocols? Third, what are the best measures of risk and masking based on screening images? Fourth, how can these findings be used to advantage in terms of: screening, prevention, biological research, and genetics and other omics research.

Towards tailored screening: Should breast cancer screening programs routinely measure mammographic density?

Jennifer Stone
1. Centre for Genetic Origins of Health and Disease, University of Western Australia, Crawley, WA, Australia
2. University of Western Australia, Perth

Background: The principal goal of breast cancer screening is early detection of disease in asymptomatic women leading to lower treatment costs and an eventual reduction in breast cancer mortality. Whilst population-based mammographic screening provides the best chances of early detection, not all women have an equal opportunity to achieve an earlier diagnosis. Women not only differ in terms of their underlying risk, but also the sensitivity of their mammogram to detect abnormalities. Thus, the benefit of screening varies widely throughout the population, with majority of women being at very low absolute risk, yet in Australia most women are screened the same way (every two years between ages 50 and 74). A stratified screening program - where women of different categories of risk are recommended different screening intervals or supplemental screening - may be a more efficient and cost-effective way of detecting breast cancer. Key risk factors could be measured at screening to identify women at different categories of risk: mammographic density and known breast cancer susceptibility genetic variants.

Methods: I will review the current evidence to support the implementation of mammographic density and genetic testing into Australian BreastScreen programs.
Results: Mammographic density, the white appearance of parenchymal tissue on a mammogram, is one of the strongest predictors of breast cancer risk and significantly reduces the sensitivity of a mammogram. There is now commercially available software that provides automated reliable measures of mammographic density that strongly predict breast cancer risk. There has also been increasing advances in explaining the genetic variation in familial breast cancer risk and risk prediction modelling applicable to population based screening programs.

Conclusion: Systematic collection of mammographic density measurements and other important risk factors at the time of screening could facilitate a paradigm shift towards stratified breast cancer screening programs in Australia.

Breast density change: Towards tailoring of adjuvant endocrine therapy

Andrew Redfern
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Of the estimated 16084 breast cancer diagnoses predicted to occur in Australia in 2016, over two thirds will be estrogen and or progesterone receptor positive and thus candidates for adjuvant endocrine therapy. Assuming a mean five year treatment period places around 50,000 women on such agents currently. Despite this volume of patients, the long duration of treatment and the potential toxicities, no tools are currently available to assess, either before or during treatment, the likelihood of benefit on these medications beyond the occurrence or otherwise of disease relapse.

Mammographic breast density (MBD) has repeatedly been shown to be a risk factor for initial breast cancer. In smaller series in the adjuvant setting higher initial MBD has also been correlated with local disease relapse. Longitudinal studies in the preventative setting have demonstrated that MBD frequently falls on anti-estrogens, particularly tamoxifen, relative to placebo. This introduces the possibility that MBD fall on an anti-estrogen may predict eventual adjuvant efficacy, allowing a change to a potentially more efficacious agent where lack of MBD change predicts the absence of benefit from the first drug employed.

The IBIS 1 study demonstrated that the primary preventative benefits of tamoxifen were almost entirely confined to those participants experiencing significant MBD reduction. Consequently, a number of retrospective cohort studies have demonstrated similar correlations in the adjuvant setting after breast cancer surgery. An overview of these studies will be presented outlining the predictive potential, limitations within patient groups by demographics and differential results by anti-estrogen class. Further, a way forward will be discussed that could bring MBD change into routine clinical use as a biomarker of anti-estrogen efficacy. This will include consideration of the retrospective analysis of existing anti-estrogen trial cohorts and the consequent inception of prospective studies.

Mammographic density in the screening setting

Susan Fraser
1. COSA exec and speaker, Edge Hill, QLD, Australia

Breast density - the percentage of fibroglandular tissue - is an important determinant of breast cancer risk, with increasing density increasing risk. In addition, breast density can significantly impair the ability to detect breast cancer. This effect is often called "the perfect storm".

In the screening setting high breast density is responsible for a large percentage of interval cancers. Additional screening modalities can be added to mammography to enhance breast cancer detection in those women with dense breasts. There is a huge variation across developed nations about the necessity to inform women who are undergoing routine population screening about their breast density.

The measurement of density can be done by the mammography reader (BIRADS 1 to 4 or A,B,C,D). In addition automated, computerised systems have also been developed to assist in the estimation of breast density.

What are our obligations to inform women undergoing routine mammographic screening about their breast density, knowing that it is a significant risk factor for developing breast cancer and may compromise the accuracy of screening?

What is the current situation in Australian state programs and what are the future plans for BreastScreen Australia? What is happening in overseas programs?

The biology underlying mammographic density and preclinical mouse models to test new therapies

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Overdetection information in a breast cancer screening decision aid: Randomised controlled trial with 12-month follow-up

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Aims: Mammography screening reduces breast cancer mortality, but most women are unaware that it also leads to diagnosis and treatment of cancers that would never be clinically relevant (overdetection). We investigated the effects of including overdetection information in a breast screening decision aid.

Methods: We recruited a random cohort of NSW women aged 48-50 for a randomised controlled trial. Eligible women had not undergone mammography in the past 2 years and had no personal or strong family history of breast cancer. 879 women were randomised to receive either the intervention decision aid (evidence-based information on overdetection, breast cancer mortality reduction, and false positives) or a control decision aid (identical but without overdetection information). The primary outcome was informed choice (adequate knowledge, and consent between attitudes and screening intentions) assessed via telephone interview about 3 weeks post-intervention. We assessed secondary outcomes by telephone at post-intervention (n=838), 6 months (n=790), and 12 months (n=746).

Results: More women made an informed choice in the intervention group (24%) than among controls (15%); difference 9% (95%CI 3%-14%); p=0.01. Compared with controls, more women in the intervention group had adequate knowledge (29% vs. 17%); fewer women expressed positive attitudes towards screening (69% vs. 83%), and fewer women intended to be screened (74% vs. 87%); all p<0.01. Knowledge and attitude differences persisted over 12 months. The intervention group had lower breast cancer worry than controls at each time-point (p<0.01; p=0.05; p=0.08). Fewer women underwent mammography within 6 months in the intervention group compared with controls (15% vs. 20%, p=0.06); by 12 months the groups equalised (both 29%).

Conclusions: Overdetection information improved women’s knowledge, shifted their attitudes, and increased the proportion of women making an informed choice about breast screening. Although the study groups differed in screening intentions post-intervention, mammography uptake over 12 months was comparable between groups.

Towards the development of a patient decision aid for women with ductal carcinoma in situ of the breast.

Claudia Rutherford, Andrew Spillane, Miriam Boxer, Joan McPherson, Zoe Winters, Rebecca Mercieca-Bebber, Margaret-Ann Tait, Madelaine King

Aims: Ductal carcinoma in situ (DCIS) is a precursor to invasive breast cancer. Treatment aims to eliminate progression to invasive disease. 10-year survival is excellent across treatments, therefore patient values and preferences are important considerations in shared decision-making (SDM). A decision aid (DA) could facilitate SDM. We document the background processes involved in development of a DA that meets users’ needs and is likely to be implemented into practice.

Methods: To develop a DA we undertook: (1) a systematic literature review to identify clinical practice guidelines (CPGs) for management of DCIS and clinical and patient-reported outcome (PRO) evidence; and (2) qualitative research to determine the information needs of women with DCIS and treating clinicians, how they prefer this information to be presented, and clinicians’ attitudes towards and barriers to using a DA.
Development of a patient decision aid for women with early stage breast cancer considering contralateral prophylactic mastectomy

Brittany Ager1
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Aims: The surgical removal of the unaffected breast in women with early stage breast cancer (contralateral prophylactic mastectomy; CPM) has increased dramatically in recent years. Although CPM reduces risk of developing a second primary cancer (contralateral breast cancer) by 95%, CPM has not been associated with increased survival in this subset of women. We developed a decision aid for women with early-stage unilateral breast cancer considering CPM. This study aims to elicit feedback from women about the decision aid as part of the development process, in order to form the basis for a future randomised controlled trial.

Methods: The content of the decision aid was based on the International Patient Decision Aids Standards (IPDAS), results from a previous patient-preference study and a systematic review on patient reported reasons for CPM. The development process involved an expert advisory group of medical oncologists, breast cancer surgeons, psycho-oncologists and researchers with expertise in medical decision-making. In order to obtain consumer feedback, we plan to recruit 20 women diagnosed with stage I or II unilateral breast cancer between 40-75 years who have finished active breast cancer treatment. Eligible women may or may not have had CPM. Women will be recruited through a breast cancer research network. Consent- ing participants will be asked to attend an interview in person or over the phone to review the decision aid. The ‘think aloud’ method will be used to assess patients’ thoughts on the decision aid. Interviews will be recorded, transcribed and coded to highlight main areas of feedback.

Results: The decision aid was finalised in June, 2016. We plan to present consumer feedback at COSA.

Conclusion: Limited information resources are currently available for women considering CPM. This project includes a novel decision aid to assist women in making this difficult decision.

Development and testing of a decision aid for women contemplating neoadjuvant systemic therapy for operable breast cancer

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Background/Aim: The decision about whether to receive neoadjuvant systemic therapy or surgery as the first treatment modality for operable breast cancer is a preference sensitive decision. Some women value the opportunity to downstage, prognosticate and have extra time to consider surgical options, while others prefer to proceed with up-front surgery. This decision is made in the difficult context of a recent diagnosis of cancer, time pressure and complex treatment options, therefore a decision aid was considered worthwhile. Our study aims to develop and evaluate a decision aid for women with operable breast cancer who are considering neoadjuvant systemic therapy.

Methods: A decision aid, developed for this study according to internationally accepted criteria, literature review and stakeholder engagement. We are evaluating this decision aid in a prospective, single-arm, pre-post study. Participants have been diagnosed with breast cancer and have been offered neoadjuvant systemic therapy with curative intent. The primary endpoints are patient and provider acceptability and feasibility; secondary endpoints include several validated decision-related outcome questionnaires such as decisional conflict, information and involvement preferences and decisional regret. Assessments occur at baseline, after use of the decision aid, between chemotherapy and surgery, and at 12 months. Participants are offered an optional interview about their experience with the decision aid, which will undergo qualitative analysis.

Results: Recruitment is underway, with 38 out of 50 planned participants enrolled. Initial interview results (n=16) indicate that the decision aid is informative, accessible and can be integrated into routine medical care. It did not tend to change the treatment schedule that patients would have received.

Conclusion: Preliminary results suggest that this decision aid is acceptable to patients. Quantitative questionnaire results will be presented at the meeting.

Disclosures: None to declare.

The Navigate trial: an online treatment decision aid for men diagnosed with low risk prostate cancer

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Background/Aim: The Navigate trial: an online treatment decision aid for men diagnosed with low risk prostate cancer.
Overview of Returning to Work After Cancer

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**Aim:** To determine the burden returning to work places on cancer survivors, what predicts success, and what interventions are effective to support return to work.

**Methods:** A systematic review between 2010 and 2015 from 6 databases identified 25 studies examining interventions for cancer patients and those with other conditions returning to work. We reviewed other publications on returning to work and collected data from focus groups of cancer patients.

**Results:** Of patients diagnosed with a curable cancer ½ are under 65 years and approximately one third of patients do not return to work. They are 1.4 times more likely to remain unemployed than healthy controls. This is worse than patients with other chronic diseases. For cancer survivors, factors predicting the ability to work include: state of health, functional capacity, competency and attitude. The work environment, the physical, mental, technical and social demands of the work, the work community and management attitudes and organizational culture also impact also on the likelihood of employment. The society in which the survivor lives impacts on employment depending on the overall unemployment rate, exit policies, social and health services and whether factors like age discrimination still exist. The skill level predicts the ability to return to work, with less skilled workers having more difficulty. There is insufficient data about factors like low socioeconomic state or living in rural and remote communities. Few studies assess interventions in vulnerable groups. Australian studies have shown that the provision of information and support about return to work is an unmet need.

**Conclusions:** Further research needs to identify interventions that would be helpful in supporting cancer survivors in returning to work. More information is required about strategies to enable vulnerable patients such as Aboriginal and Torres Strait Islanders to return to employment after cancer.

Financial toxicity and income loss: can’t pay the copay

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**Aim:** The very high cost of modern cancer treatments is raising the issue of health systems and individuals capacity to afford these resources. The term ‘financial toxicity’ is used to describe the scenario where financial distress or hardship is a side-effect of cancer treatment. This study involved a systematic review on the extent and predictors of financial toxicity in cancer survivors and to determine the role of income loss through work reductions.
Methods: A systematic review was performed on published journal articles from 2013 to June 2016. We identified studies describing financial toxicity among survivors of any cancer type and age. Searches and data extraction was performed by two researchers and the PRISMA guidelines for systematic reviews were used. Findings were synthesized narratively. Study quality was assessed using the National Institute of Health Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies.

Results: Twenty-four studies met our search criteria representing analyses performed in 16 countries and ~270,000 cancer survivors. Using monetary or objective indicators, financial toxicity was experienced in 28-38% of participants. Changes to work participation were reported by 7 studies (29%). Only 6 studies calculated cancer-related out-of-pocket expenses as a ratio of household income. In multivariate analyses, reduced work participation and associated lower income was a significant determinant of financial toxicity. Studies consistently show adjuvant therapies, more recent diagnosis, younger age and low income was significantly associated with increased financial hardship, increased treatment non-adherence and poorer quality of life. As most studies were cross-sectional and not population-based, causal and temporal inferences were not possible.

Conclusions: Financial toxicity is a complex but significant issue for many cancer survivors. Wage losses after cancer may be the most important determinant of financial decline however is not well studied compared with studies focussed on financial outgoings for cancer treatments.

Facilitating quality employment for cancer survivors - opportunities and challenges

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Aim: To synthesise results from a series of qualitative studies conducted in South Australia on RTW and cancer in order to inform recommendations to facilitate quality RTW outcomes for cancer survivors.

Methods: Over the past 4 years, our group has conducted a series of studies investigating issues pertaining to RTW and cancer. Participants have comprised patients/survivors, employers and employee assistance providers, oncologists, nurses, allied health professionals, and most recently – general practitioners.

Results: Survivors consistently identify the impact of cancer and its treatment of their ability to work yet there are no clear guidelines for the assessment of work ability, or mechanisms to communicate work capacity to employers. A lack of policy is evident in Australian organisations to specifically deal with managing issues of disclosure versus open communication about cancer. Discrimination and stigma about cancer requires ongoing education in workplaces, as well as in the wider community. General practitioners appear to be central to managing the assessment or work ability despite the lack of appropriate objective tools to assess work capacity across important domains including, physical, cognitive, emotional or psychosocial capacity. Centrelink policies impede the choices of survivors to gradually RTW, and reduce options provided to GP’s to support patients RTW. Often the only option for individuals from disadvantaged backgrounds (and their GP’s) is to sign off on documentation to transfer a short term sickness benefit to a long term disability benefit. For other survivors, financial situations force an early RTW which poses risks to injury to themselves as well as others in their workplace.

Conclusions: This presentation will focus on identifying and addressing the gaps that prevent Australian cancer survivors from experiencing quality RTW outcomes. We envisage that the recommendations may serve to underpin efforts of consumer advocacy groups to improve opportunities for quality RTW for cancer survivors.

Workaftercancer.com.au – an online resource to support cancer survivors.

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Aim: Information and support regarding employment and return to work (RTW) is an important unmet need for cancer survivors and oncology health professionals, as well as others in the community, including employers. The aim of this project was to develop a suite of resources to improve return to work of cancer survivors with particular emphasis on disadvantaged communities.

Methods: The study involved a qualitative examination of the views of stakeholders (patients, carers, health care providers) on the barriers and gaps of support for RTW after cancer with specific focus on disadvantaged communities; a literature review of evidence on the effectiveness of interventions that support RTW; identification and review of existing resources; and an Expert Consensus meeting involving consumers, health, government, employer, business and union representatives.

Results: Based on findings of the focus groups, interviews, literature and resource review and Expert Consensus meeting, the a tailored web-based resource was the preferred model. The resource is customized to different users groups and provides practical resources, including specific tools including lists, templates, check lists and links to existing resources in the area of work after cancer in Australia and internationally. A comprehensive strategy has been developed to support dissemination.

Conclusion: We have developed a resource to support return to work after cancer that providers tailored information for people with cancer, health care providers and employers. Evaluation of the resource uptake is ongoing.

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Real- time HER2 status monitoring using circulating tumour cells
Expression of urokinase plasminogen activation system in primary gastro-oesophageal adenocarcinoma: a systematic review and meta-analysis

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The urokinase plasminogen activation (uPA) system is a key pathway in facilitating tumour invasion and establishment of metastases. Although the uPA system is a proven biomarker in various solid tumours, its significance in gastro-oesophageal cancer has not been established. This study aims to evaluate clinicopathological features and prognostic outcomes associated with expression of key components of the uPA system in primary resected oesophageal, gastro-oesophageal junction and gastric adenocarcinomas.

Method: Studies evaluating urokinase plasminogen activator (uPA), urokinase plasminogen activator receptor (uPAR) and plasminogen activator-inhibitor-1 (PAI-1) and 2 (PAI-2) were identified by literature searches. Pooled hazard ratios (HRs) were calculated for overall survival (OS), recurrence free survival (RFS) and clinicopathological correlations including tumour stage, grade, invasion and presence of metastases. Data were synthesised using generic inverse variance and a random effect modelling.

Results: Forty-one studies of 2689 patients were identified. After applying stringent exclusion criteria, twenty-nine (1966 patients) were included in the meta-analysis. Expression rates of uPA, uPAR, PAI-1 and PAI-2 were 55.7%, 55.1%, 51.7%, 43.0%, respectively. uPA, uPAR and PAI-1 expression are significantly associated with high risk clinicopathological features. High uPA expression is associated with shorter RFS (HR 1.9 95% CI 1.16-3.11, p=0.01) and OS (HR 2.21 95% CI 1.74-2.80, p=0.0001). High uPAR expression is associated with poorer OS (HR 2.21 95% CI 1.82-2.69, p=0.0001). High PAI-1 expression is associated with shorter RFS (HR 1.96 95% CI 1.07-3.58, p=0.03) and OS (HR 1.84 95% CI 1.28-2.64, p<0.0001).

Conclusion: Gastro-oesophageal cancer is a common and lethal malignancy, currently marked by a lack of predictive biomarkers. We propose that the uPA system is a clinically relevant biomarker in gastro-oesophageal cancers, with high expression of uPA, uPAR and PAI-1 associated with higher risk diseases and poorer outcomes. Further prospective studies are required to confirm the role of uPA, uPAR and PAI-1 as independent prognostic markers.

Broadening the use of the Heng prognostic criteria in metastatic renal cell carcinoma: application of the criteria irrespective of treatment regimen

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Aims

The Heng criteria were described in 20091 to provide a contemporary prognostic model for metastatic renal cell carcinoma (mRCC) patients treated with anti-VEGF therapy. Six independent negative prognostic factors were identified - Karnovsky performance status <80, time to treatment >1 year, haemoglobin level less than lower limit of normal, platelet count greater than upper limit of normal (>ULN), neutrophils >ULN and calcium >ULN.
Patients were stratified into favourable, intermediate and poor risk groups based on their score. We examined the validity of the Heng criteria for a cohort of 67 patients with clear cell mRCC and then applied it irrespective of treatment regimen.

Methods
Characteristics and outcomes of 67 patients who met the inclusion criteria with clear cell mRCC were collected. Patients were divided into prognostic groups per the Heng criteria with adjustments made for the time to treatment criterion to allow stratification of untreated patients. The overall survival (OS) for the prognostic groups were analysed with the Kaplan-Meier method.

Results
The median age at metastatic diagnosis was 63.8 years (range 41.2 to 87.6). Forty-six of the 67 patients were male (68.7%). Forty-seven (70.1%) were treated with a first-line TKI, of which 41 (89.4%) were treated with sunitinib. The median OS for the entire cohort was 20.5 months (95% CI 11.4 to 29.6). The median OS in TKI-treated patients was 30.3 months for the favourable risk group, and 24.5 (95% CI 13.9 – 35.2) and 9.0 (95% CI 5.0 – 13.0) months for the intermediate and poor risk groups respectively. When all patients were included, the median OS was not reached for the favourable risk group and was 24.5 (95% CI 13.3 – 35.8) and 7.0 (95% CI 0.0 – 14.6) months for the intermediate and poor risk groups respectively.

Conclusions
The prognosis of our cohort of patients could be predicted with the Heng criteria. In addition, our analysis demonstrated that the Heng criteria can be applied to a more generalised cohort and is not dependent on treatment status.


A risk score based on preoperative serum metabolomic profiles identifies patients with early breast cancer at increased risk of recurrence in a multicentre population: outcomes by Adjuvant Online stratification.

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We have previously shown that serum metabolomic spectra can be used to predict relapse in a single-centre cohort of ER- early breast cancer (EBC) patients. Here, we investigated this further using serum from a larger cohort of premenopausal, ER+ EBC patients enrolled in a multicentre phase III trial investigating the effect of timing of adjuvant surgical oophorectomy in the menstrual cycle. We also explore the ability of the metabolomic risk score to improve prognostication in patients at different levels of risk by traditional methods.

Methods: Proton NMR spectra were generated for 590 serum samples obtained preoperatively in the adjuvant trial, and 109 serum samples from women with metastatic breast cancer. In a training set, a model was built to discriminate EBC from MBC based on the NMR profiles, using Random Forest classification. A recurrence risk score for EBC patients was generated, based on the likelihood of an EBC sample being misclassified as MBC. It was then applied to a test set of 234 EBC patients with relapse or follow-up greater than 6 years, to predict relapse. A cut off for the risk score was identified using ROC analysis. Exploration of outcome by recurrence score was performed using Kaplan Meier. Impact of individual metabolites is assessed.

Results: The RF model separated EBC from MBC with discrimination accuracy of 84.9% in the training set. In the test set, the RF recurrence risk score correlated with relapse, with an area under the curve of 0.747 in ROC analysis. Accuracy was maximised at 71.3% (sensitivity 70.8%, specificity 71.4%). The model performed independently of age, tumor size, grade, HER2 status and nodal status. When stratified by Adjuvant Online score, the RF risk score improved prognostication in the lower two tertiles.

Conclusions: In a multicentre group of ER+ EBC patients, a model based on preoperative serum metabolomic profiles was prognostic for disease recurrence. This was independent of traditional clinicopathological risk factors, although not discriminatory in the very high risk subgroup by Adjuvant Online.


Erlotinib survival and use in non-small cell lung cancer at two large Queensland public hospitals: comparison to pivotal trials supporting subsidy on the Pharmaceutical Benefits Scheme

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Introduction: Erlotinib is an epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor used in the treatment of non-small cell lung cancer (NSCLC). Erlotinib was subsidised on the Pharmaceutical Benefits Scheme (PBS) for the treatment of advanced stage (IIIB or IV) NSCLC (August 2008). The trials supporting PBS subsidy showed there was a 0.2 months (95% CI 0.65-1.68) difference in survival between erlotinib and standard chemotherapy - in favour of chemotherapy. Patients who have an activating EGFR mutation have better survival outcomes compared to those without. It is unclear what survival outcomes are seen in a ‘real world’ setting.
Patient Preferences for Adjuvant Radiotherapy - outcomes from the TARGIT-A Study in Western Australia.

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Aim: TARGIT-A compared single-dose intra-operative radiotherapy (IORT) to 6-7 weeks of daily conventional external beam radiotherapy (EBRT) in women with early breast cancer. IORT was found to have non-inferior risk of local cancer recurrence and survival. The preferred treatment approach is IORT during WLE. IORT as a separate procedure still offers convenience but may come at a higher risk of local recurrence. Investigation of patient treatment preferences can identify what risk of recurrence patients would be willing to accept to have IORT, and in what setting.

Methods: Treatment preferences were determined by self-rated questionnaires using validated trade-off methodology in two cross-sectional studies: a) 209 TARGIT-A participants (IORT group n=108, EBRT group n=101); b) 123 similar patients diagnosed with breast cancer yet to receive radiotherapy (Pre-Treatment group), 85 of whom also submitted post-radiotherapy questionnaires.

Results:
The only significant factor driving treatment preferences for TARGIT-A patients was the treatment they had received as part of the trial, such that 60% of IORT patients would accept IORT at an increased risk of 4%-6% in contrast to 12% of patients in the EBRT group. 85% of the pre-treatment group reported IORT an acceptable treatment option, with 23% indicating increases of 4-6% would be acceptable in the trade-off for convenience. If all treatment modalities offered equivalent outcomes, 13% of patients chose EBRT, 25% chose IORT as separate procedure and 62% chose IORT during WLE as their preferred option. These results differed in the post-treatment questionnaire such that there was more acceptance of IORT in the pre-treatment stage.

Conclusion:
Breast cancer patients yet to receive radiotherapy are willing to accept a more convenient treatment option even at a greater risk of recurrence. Measured patient preferences are highly influenced by experience of treatment received. Post-treatment preference studies may not reflect views of women who need to make treatment decisions.

Pilot-testing the feasibility and acceptability of a radiation therapy Talking Book

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Background: Radiation therapy (RT) is a common yet challenging treatment for people to understand. Consistent and timely information helps patients feel prepared for treatment and alleviates anxiety. We developed a novel psycho-educational Talking Book (written booklet, with accompanying audio-recording) using low literacy design principles, to facilitate communication between patients, radiation therapists and nurses.

Aims: To examine the effect of the tool on knowledge, anxiety, question asking, concerns and communication, and obtain acceptability and feasibility feedback regarding use in RT departments.

Methods: Patients with a range of cancers planned for external RT were recruited from two Sydney hospitals. In a pre-post design participants completed two surveys before and after receiving the tool. Outcomes assessed included: knowledge, anxiety, and concerns about RT. Qualitative interviews were conducted with patients (n=40) and health professionals (n=11) to obtain feedback on format, content and utility of the tool, and perceived challenges and benefits of using it.

Findings: We recruited 40 participants, mean age 64 years (r47-82), 29 female, 18 completed some high school, and 24 localised cancer. Their health literacy was high (37). Total knowledge scores (out of 20) improved significantly from 13.9 points (95% CI: 12.8, 15.0) to 17.7 (17.1, 18.2) p<0.001. Concerns about RT decreased significantly (p=0.004). State anxiety decreased from 37.4 (33.2, 41.6) to 32.4 (28.6,
Can exercise prevent aromatase inhibitor (AI) induced musculoskeletal pain in women with breast cancer? An interim report.

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Aim: To investigate whether a supervised exercise program can reduce or prevent musculoskeletal pain in women with breast cancer undergoing AI therapy.

Methods: Twenty participants with breast cancer have thus far been randomised to, and completed either: (a) usual care with advice regarding benefits of regular exercise; or (b) usual care + 12 week supervised gym-based and home exercise program consisting of upper and lower body resistance exercises with self-selected aerobic exercise. Participants accrue 150 mins / week of moderate intensity aerobic exercise at 60-70% HRmax on 5 or more days of each week including 2 supervised sessions / week. Initial exercise intensity is individualized and generally begins at 55% to 60% of HRmax (15 to 30 minutes per session) and progresses to 60% - 70% of HRmax by week 6. Strength training consists of 2 supervised sessions per week. On at least 3 other days, participants perform resistance band exercises at home. The primary outcome measures are pain scores (brief pain inventory; BPI) and grip strength (JAMAR dynamometer (kg)) measured at baseline, 3, 6 and 12 months. Two-way repeated ANOVAs evaluate differences between groups and factors. Results: Mean pain scores increased by one BPI unit between baseline and 12 month follow-up (p>0.05) for participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undertaking the exercise program, compared to control participants undergoing usual care. Conclusion: A 12 week supervised exercise program combined with home-based exercises may control AI-induced musculoskeletal pain.

Attitudes of patients with metastatic cancer towards research biopsies

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Background: Tissue obtained from patients with metastatic cancer assist the understanding of the molecular biology of cancer. Research biopsies can be a stand-alone procedure (research purposes only biopsy, RPOB) or performed during a clinically indicated biopsy (additional pass biopsy, AB).

Aims: This study evaluates the attitudes of patients with metastatic cancers towards research biopsies outside a clinical trial.

Methods: Patients with metastatic cancer completed a paper questionnaire that assessed patients’ willingness to consider research biopsies. Factors analyzed included sociodemographic information, cancer type, biopsy timing, biopsy site, and information about prior trial and biopsy participation. Univariate and multivariable analyses were conducted using random-effects logistic regression.

Results: The questionnaire was completed by 165 (40 melanoma, 37 colorectal, 32 breast, 30 lung, 25 prostate) patients. Melanoma patients demonstrated the greatest willingness to consider a research biopsy compared to other cancer types (all p < 0.05). For example, patients with metastatic melanoma exhibited the odds of willing to consider a research biopsy eight times higher than the patients with metastatic colorectal cancer (p=0.0001, 95% CI 0.04, 0.34). Race, time since a previous biopsy, time since metastatic diagnosis, transportation time and previous trial enrolment were all statistically significantly associated with the willingness to consider a research biopsy on univariate analysis. In multivariate analyses, the odds of patients considering an AB compared to a RPOB were 14.6 times higher (p < 0.0001, 95% CI 7.9-27.0). Patients were also more willing to consider having blood taken for research purposes compared to undergoing a biopsy (all p < 0.0001).

Conclusions: Patients show a greater willingness to consider an AB compared to a RPOB, as well as biopsies performed at less invasive bodily sites. Further research to address motivations and barriers to research biopsies should be considered to increase the availability of this important resource.
Acceptability of tailored life-expectancy information in patients with advanced cancer participating in an Australian nurse-led ACP RCT

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Aims: We sought to examine the acceptability and understanding of life-expectancy (LE) information in patients with advanced cancer participating in an RCT of a nurse-led advance care planning (ACP) intervention.

Methods: 209 patients with advanced cancer and an expected LE of 3–12 months were randomized to receive usual care or usual care plus ACP. At baseline, data was collected from oncologists estimating median LE (in months) for each patient. Participants in the ACP intervention group were offered individualized estimates of worst-case, typical, and best-case scenarios for LE, based on their oncologist’s estimate. Patients’ understanding of their LE was recorded at baseline (pre-intervention) and again at 8 weeks (6 weeks post-intervention). Change in understanding of LE was calculated.

Results: The mean oncologist estimate of LE was 7.7 months (SD=2.9). At baseline 61.5% of patients did not know their likely estimated survival, 10% preferred not to answer this question and in 28% (n=56) the median estimate of LE was 12 months (SD=27.5). Only 18 of 105 patients in the intervention group (17%) chose to receive information on LE when offered by the ACP nurse. At 8 week follow-up, the accuracy of understanding of LE was not significantly different between the intervention and control groups (change score = -3.9 vs -2.45, p=0.718).

Conclusions: Prognostic information clarifies the focus and communication of goals of care, reducing the aggressiveness of EoL care and improving QoL for patients. Studies have demonstrated the acceptability of oncologist-lead interventions providing patients with tailored LE information, with subsequent improvement in patients’ understanding. However, the same was not true for our nurse-led intervention. The majority of patients in the intervention group chose not to receive information regarding LE and their understanding of LE post-intervention was not significantly different than the control group.


Oncology rehabilitation in Australia, ‘why isn’t it standard practice?’: a mixed methods study

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Aim: Oncology rehabilitation improves outcomes for cancer survivors but little is known about program availability in Australia. The aims of this study were: to describe oncology rehabilitation programs in Australia, to determine whether the exercise component of these programs was consistent with guidelines, and to explore barriers and facilitators to program implementation.

Methods: A sequential, explanatory mixed-methods study was completed in two phases: (1) A survey of Australian oncology rehabilitation programs; and (2) purposively sampled follow-up semi-structured interviews with senior clinicians working in oncology rehabilitation.

Results: Hospitals and/or cancer centres from 42 public hospital health networks (representing 163 hospitals) and 39 private hospitals were contacted to identify 31 oncology rehabilitation programs. All 31 surveys were returned (100% response rate). Programs were typically multidisciplinary, ran twice weekly, provided education and exercise, and included self-management strategies. Exercise prescription and progression was patient centered and included a combination of resistance and aerobic training supplemented by balance, pelvic floor and core stability exercises. Challenges to implementation included a lack of awareness of programs in the community and organisational barriers such as funding. Strong links with oncologists facilitated program referrals.

Conclusion: Despite evidence to support oncology rehabilitation, there are few programs in Australia and there are challenges that limit it becoming part of standard practice. Programs that exist are multi-disciplinary and place a greater emphasis on patient factors rather than published exercise guidelines.

The influence of exercise intensity and frequency on cardiorespiratory fitness and body composition in colorectal cancer survivors: a randomised controlled trial

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Deteriorations in both cardiorespiratory fitness (VO2-peak) and body composition are common following colorectal cancer diagnosis (CRC) and are independently associated with increases in morbidity and mortality. Aerobic exercise training counteracts these effects and therefore can significantly improve clinical prognosis. However the optimal exercise prescription (intensity and frequency) to improve these outcomes in CRC survivors is unknown. This randomised controlled trial investigated the effect of eight weeks of moderate intensity exercise (MIE group; 50min; 70% peak heart rate (HRpeak); 24 sessions), compared to high intensity interval training (HIIT; 4x4min; 85-95% HRpeak) completed at an equivalent (HIIT-T group; 24 sessions) or tapered frequency (HIIT-T group; 16 sessions) on VO2-peak and body composition (lean and fat mass). CRC survivors (n=57; intended accrual: n=69) completed VO2-peak testing and dual-energy x-ray absorptiometry scans of body composition at baseline, 4 and 8 weeks. No severe adverse events occurred. Using mixed effects modeling controlling for baseline values and sex, with Bonferroni adjustments, increases in VO2-peak were significantly greater following both 4 (+3.0mlkg⁻¹min⁻¹ 95%CI 0.6-5.3, p=0.008) and 8 (+2.3mlkg⁻¹ min⁻¹ 95%CI 0.0-4.7, p=0.049) weeks of HIIT compared with MIE. After 8 weeks, there was a significantly greater reduction in fat mass in the HIIT compared to the MIE group (-0.7kg 95%CI -1.4-0.03, p=0.038). No significant (p>0.05) changes in lean mass were observed. Compared to MIE equivalent to the current aerobic exercise recommendations for CRC survivors, HIIT promotes superior improvements in VO2-peak and fat mass, which are linked to clinically meaningful improvements in CRC morbidity and mortality. Non-significant (p>0.05) differences between the HIIT and HIIT-T groups across the intervention indicate that prescription of exercise intensity is more important than frequency. Therefore HIIT programs can still elicit clinically relevant improvements in VO2-peak and fat mass during periods of reduced training frequency, such as interruptions due to commodities, travel or non-adherence.

Head and Neck Cancer Patient Education and Support Needs - A multi-institution patient survey

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Background: Head and neck cancer (HNC) encompasses a diverse group of tumours and thus providing appropriate and tailored information to patients prior to, during and following treatment is a challenge.

Objectives: Characterise the experience and unmet needs of HNC patients regarding information and support provision.

Methods: A 28 question cross-sectional survey was completed by patients treated for HNC at one of four institutions in NSW, Australia (Chris O'Brien Lifehouse, Liverpool, Westmead, and Wollongong Hospitals). It consisted of the adapted Kessler Psychological Distress Scale (K-10) and questions assessing information, quantity and format.

Findings: A total of 597 patients responded, their mean age was 58 (range: 21-94) with 284 males and 313 females. Most patients reported information regarding the disease process (76%), prognosis (67%) and treatment (77%) was sufficient, and 50% received little or no information about coping with stress and anxiety. A substantial proportion of patients reported receiving minimal information on psychosexual health (56%) or availability of patient support groups (56%). Most patients preferred access to multiple modes of information delivery (72%) with the preferred modality being one-on-one meetings with a health educator (37%) followed by internet based written information (19%).

Interpretation: Patients with HNC are a diverse group with complex educational and support needs. Patients appear to be given information regarding survivorship topics such as psychological well-being, patient support groups, and psychosexual health less frequently than disease and treatment. Verbal communication needs to be reinforced by accessible well-constructed written and multimedia resources appropriate to the patient's education level.

Context impacts outcomes: lessons learnt from the South Australian Survivorship Framework pilot implementation

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Breast cancer (BC) survivors experience ongoing health problems compared to the general population. The Sydney Survivorship Clinic aims to help cancer survivors better manage their disease and treatment effects. Here we report the health status of breast cancer survivors post primary adjuvant treatment.

**Method:**
BC survivors completed questionnaires assessing: distress, symptoms, quality of life (QOL), diet and exercise before attending the Sydney Survivorship Clinic. Attendees were seen by a multidisciplinary team (medical oncologist, cancer nurse specialist, dietitian, clinical psychologist and exercise physiologist).

**Results:**
A total of 96 women with BC have attended an initial clinic visit from September 2013 to July 2016: median age 52 years (range 30-75). Median time from diagnosis: 10.4 months (range 2.3-134). All had undergone surgery, 97% had received chemotherapy, 68% radiotherapy, and 64 were receiving hormonal treatment. Most common symptoms of at least moderate severity were: fatigue (58%), insomnia (53%), hot flushes (44%), pain (37%), anxiety (37%), numbness (37%), and sore hands/feet (37%). 54% had a distress thermometer score of 4+, meeting screening guidelines for further investigation. Overall, 76% were rated by the clinical psychologist as having ‘fear of cancer recurrence’; 30% were referred for follow-up, and a further 9% were already linked with psychological services.

Overall QOL score (FACT-G) was 55.9, with physical and emotional domain t-scores more than 3SD below peer-matched population scores. Average BMI was 28.4kg/m² (range 18-59kg/m²); 65% were overweight or obese, with mean weight gain since diagnosis of 2kg (range: -10 to 18kg). Only 33% of survivors reported meeting physical activity guidelines. Self-rated ECOG performance status (PS) was: PS0 41%, PS1 52%, and PS2 6.5%.

**Conclusion:**
Distress, fatigue, insomnia, hot flushes, poor QOL, obesity and sedentary lifestyle are common in this cohort of breast cancer survivors, persisting years after cancer diagnosis. The Survivorship clinic identifies important issues for women with breast cancer after adjuvant treatment and facilitates effective management of these concerns.
Timeliness of Management for Non-Small Cell Lung Cancer Patients in South Western Sydney

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Introduction: Timeliness of management is important for patients diagnosed with Non-Small Cell Lung Cancer (NSCLC). Delays in management increase the risk of disease progression and potentially impact on survival.

Aims: Measure timeliness of management of NSCLC patients in South Western Sydney Local Health District (SWSLHD) and evaluate factors that impact on this.

Methodology: A retrospective cohort of South Western Sydney (SWS) patients with newly diagnosed NSCLC from 2006-2012 was identified from the SWSLHD Clinical Cancer Registry. Benchmark time intervals evaluated were "Diagnosis to Initial Management" within 31 days and "Referral to Initial Management" within 42 days for specific treatment types. Negative binomial regression was used to determine factors associated with timeliness of care.

Results: 1926 patients with NSCLC were identified with a median age of 70 years. 61.9% were male and 51.5% were born overseas. Stage distribution was I(10%), II(11%), III, IV and unknown in 21.5%, 23.4%, 49.8% and 5.2% respectively. Initial management was palliative care 31.7%, radiotherapy 25.9%, surgery 16.3% and systemic therapy 15.9%. Median time from diagnosis to initial management was 32 days (IQR 15-58) overall, 19 days (IQR 9-46) for palliative care, 35 days (IQR 20-60) for radiotherapy, 37 days (IQR 24-57) for systemic therapy and 48 days (IQR 23-71) for surgery. Median time from referral to initial management was 21 days (IQR 13-32) for radiotherapy, 25 days (IQR 15-35) for chemotherapy and 35 days (IQR 21-49) for surgery. On multivariable analysis, factors associated with longer diagnosis to management intervals were older age (>60y), overseas-born, ECOG performance status 0-1 and Stage I-III. 50.1% of patients had a diagnosis to management interval >31 days and 11.9%, 17.8% and 34.8% had a referral to management interval >42 days for radiotherapy, chemotherapy and surgery respectively.

Conclusion: A significant proportion of patients are not meeting published benchmarks for timeliness of care in NSCLC.

Breast reconstruction following mastectomy in NSW, 2008-11

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Aims
To report on the use and variation in the use of immediate (IBR) and delayed breast reconstruction (DBR) among women in NSW following mastectomy for primary invasive breast cancer.

Methods
This is a population-based retrospective cohort study that used de-identified linked public and private hospital administrative data. The study cohort included all women resident in NSW, diagnosed with primary invasive breast cancer who underwent a mastectomy as their first breast procedure performed at the time of mastectomy and DBR included procedures in the 3 years following mastectomy.

Results
Three years after a mastectomy 17% (969/5698) of women had a breast reconstruction. Use of IBR increased from 7.1% of women in 2008 to 11.0% in 2011. Use of DBR remained stable. Over half of women aged 18 to 39 years had BR compared with a third of 40-49 year olds. BR was rare among women aged over 70 years.

The proportion of women who underwent BR varied from 7.6 to 34.9% by Local Health District (LHD) of residence. These differences remained after adjusting for differences in age and comorbidity status. IBR was more common among residents of metropolitan (11.6%) compared with regional/natural LHDs (4.5%). Women who underwent mastectomy in a private hospital were more likely to have IBR and DBR compared with those treated in public hospitals (IBR 11.9 and 7.1%, DBR 8.7 and 6.3% respectively).

Conclusions
Despite BR being recognised as an important component of care following mastectomy, the proportion of women having BR remains low. Women experience age-related, geographical and financial barriers to accessing BR following mastectomy. Variation in use of IBR is the biggest contributor to variation in BR by geography and the public/private sectors. Greater engagement of specialist plastic surgeons in multidisciplinary care is warranted.

Treatment and outcomes of metastatic colorectal cancer patients in public and private hospitals: Results from the South Australian Metastatic Colorectal Cancer Registry

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Sara SW Wahlroos

Adherence to endocrine therapy in a real world cohort of women with early breast cancer treated at two Sydney cancer centres.

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Assessing the medical workforces perceived barriers to the prescription of risk-reducing medication for women at moderate and high risk of breast cancer

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Aim:

To assess the attitudes of Australian health professionals to tamoxifen as a risk-reducing medication (RRM). To identify barriers to prescription due to workforce issues, risk assessment skills, willingness to initiate or monitor whilst on RRM.

Method:

Members of relevant medical organizations in Australia and New Zealand were invited to participate in a web-based survey aiming to accrue 240 participants.

Results:

100 participants were recruited including 33 genetic health professionals, 32 medical oncologists and 20 surgeons following which it was closed due to slow accrual. 99% of respondents perceived tamoxifen to be effective.

Overall respondents felt that assessing a patient’s personal risk of breast cancer should be performed by cancer specific services such as cancer geneticists (74%) or medical oncologist (65%) rather than GPs (26%). Genetic health professionals and surgeons were more aware of risk assessment tools such as BOADICEA than medical oncologists (p= 0.001). Respondents felt that cancer geneticist (84%) and medical oncologists (85%) should be responsible for discussing the potential use of tamoxifen. Medical oncologists were favoured over cancer geneticists to initiate prescription (83% vs 56%) and monitor (72% vs 33%) tamoxifen use. Most felt GPs could also monitor (64%).

The most frequently identified barrier to physician prescription was a feeling that it wasn’t their role (50%) Genetic health professionals felt this more than medical oncologists (85% vs 28%). At risk women are being seen at low rates with only 14 % of respondents seeing > 100 patients per year. Whilst 75% of respondents were happy to oversee more patients on RRM, only 10% of health professionals were willing to see > 49 additional patients per year indicating a workforce issue.

Conclusions:

Despite tamoxifen as a RRM being widely accepted to be effective by health professionals there are still significant barriers to its prescription including workforce issues.

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Conclusions:

Despite tamoxifen as a RRM being widely accepted to be effective by health professionals there are still significant barriers to its prescription including workforce issues.
Ki67/BCL2 index: impact on prognosis in Australian women

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Aims
ER-positive tumours frequently co-express B-cell lymphoma 2 protein (BCL2). BCL2 is an anti-apoptotic protein shown to be a favourable prognostic marker and an index combining Ki67 and BCL2 was shown to be an independent predictor of survival. A Ki67/BCL2 index would be relatively easy to implement. The aim of this study is to determine whether the Ki67/Bcl2 index can be validated in a local context.

Methods
Subjects diagnosed with invasive breast cancer from 2000 to 2003 were identified through the cancer registry. Ethics approval was obtained from Melbourne Health HREC and ratified by Walter and Eliza Hall Institute HREC. Archival blocks of the primary tumours were collated and sectioned and immunostained for BCL2 and Ki67 and scored using previously established protocols. The original pathology report determined size, grade, cancer type, ER, PgR, HER2 and nodal status. The subject’s medical record identified treatment modalities and survival. The Ki67/BCL2 index was correlated with outcome.

Results
The complete pathological, clinical and outcome data were available for 186 women of 238 diagnosed with invasive breast cancer between 2000 and 2003. Preliminary analysis revealed that 124 (66%) were ER-positive (>1% ER positive tumour cells) and 167 (89%) were BCL2-positive (>10% BCL2 positive tumour cells). Tumours were positive for both BCL2 and ER in 122 cases (65%). Across the cohort, 163 (87%) subjects were alive five years after diagnosis. Univariate and multivariate analysis of the biomarkers and index is currently being carried out and will be reported.

Conclusion
The Ki67/BCL2 index could help shape decision making for women with breast cancer if further work confirms that it is a prognostic marker. Since BCL2 is being investigated as a therapeutic target for women with metastatic breast cancer (mBEP, ACTRN12615000702516), identification of BCL2 positive tumours could also serve as a predictive biomarker.
Impact of tumour infiltrating lymphocytes (TILs) & tumour regression in primary cutaneous melanoma on response to Immune Checkpoint Inhibitor (ICI) therapy

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Introduction: Immune checkpoint inhibitors (ICIs) have revolutionized melanoma treatment. However, only one third of patients achieve durable disease control and long-term survival. Treatment is costly and associated with novel immune related adverse events. Therefore, there is an urgent need for predictive biomarkers to better select patients most suited to treatment with ICIs. Tumour infiltrating lymphocytes (TILs) is a favorable prognostic marker in different tumour types. We therefore evaluated the predictive significance of TILs and regression in primary cutaneous melanoma and correlated it with response to ICI therapy.

Patients & Methods: Patients treated with ICI therapy between Feb 2015–June 2016 for advanced melanoma were identified from institutional database. Data was collected from electronic medical records and Cancer Registry with a censor date of 1st June 2016. Survival was calculated through Kaplan-Meir analysis. Overall survival (OS) and progression free survival (PFS) was calculated from start of therapy till date of death/last follow up & date of progression/death respectively.

Results: 35 patients were identified that fulfilled selection criteria. Regression and TILs were reported in the primary pathology of 21 patients. Patients with TILs in their primary pathology had a trend towards improved outcome with ICI for both PFS (6m vs 2.5m, log-rank P=0.052) and OS (NR vs 3m, p=0.2) compared to those with no TILs. There was no difference in PFS or OS for those with or without regression.

Conclusion: TILs in primary cutaneous melanoma could be a useful predictor of response to ICI therapy and needs to be further evaluated prospectively in larger studies.

Translation of the CROSS tri-modality protocol for oesophageal cancer to the general population: A compliance audit.

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Aims:
To assess whether the patients treated by tri-modality treatment fulfill the eligibility criteria of the actual protocol.

Methods:
A compliance audit was carried out by querying the electronic databases for prospectively recorded patients undergoing tri-modality treatment. The patient characteristics and outcome were compared against the eligibility criteria of the CROSS regimen. Analysis has been done by Descriptive statistics.

Results:
Between 2014-15, a total of 65 patients with oesophageal cancers were discussed in the Gastro-intestinal Multi-disciplinary team (GIMDT). In all, 23 patients had tri-modality treatment. 14 of these are included in this study. Rest were treated with more aggressive neoadjuvant regimes. On endoscopy, the tumours ranged from 2-10 cm. Endoscopic Ultrasound was not routinely performed as all patients had a PET scan and advanced disease. Pulmonary function assessment was variable. Variation in the patient selection as compared to the CROSS regime was noted for age, pre-treatment work up, and the length of the tumour. Chemo-radiotherapy was delivered without any breaks or dose reductions. Surgical complications noted were of similar to that reported in the publication. 3/14 patients would not have been eligible for the trial protocol but were treated by consensus of the GIMDT as the variations were considered minor. All three had significant complications. There were 2 deaths within 90 days, one immediate post-op and the other due to complications as a result of a volvulus. The former patient had significant co-morbidities but was cleared for surgery on anaesthetic review, while the latter had unrecognized metastatic disease. Within the short follow-period, another 4 deaths has occurred due to disease relapse. Interestingly, the more aggressively treated group with similar co-morbidities did not have any 90-day mortality.

Conclusions:
Most of the treated patients complied with the CROSS protocol. Variation in approach should considered carefully within the confines of a GIMDT. However, since the benefit is not across all patient groups, controlled phase 4 studies are needed to determine optimal management for patients ineligible as per the CROSS protocol.

Investigating the HER2-3 dimer as a theranostic target in brain metastases

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The development of brain metastases marks a serious downturn in the course of disease for cancer patients, marked by high morbidity and virtually 100% mortality. Brain metastases are becoming more frequent in line with population ageing and improving treatment of systemic disease, and the incidence now outweighs that of any individual malignancy. The societal burden is further increased by expensive multimodal treatments and hospitalisations. Diagnosis is normally based on magnetic resonance imaging (MRI) of symptomatic patients – that is, once tumours are sufficiently advanced to produce neurological symptoms through localised disruption of brain tissue architecture. Furthermore, obtaining diagnostic information on potential therapeutic targets is difficult, with histopathologic assessment limited to surgical candidates (patients with suitable performance status and operable disease).

We propose that clinical management could be improved by the development of theranostic approaches, providing precise and sensitive diagnostic information on the extent of disease, expression of targetable markers and ancillary parameters impacting on drug uptake (e.g. perfusion dynamics and interstitial pressure). We and others have shown that the HER2-3 dimer is overexpressed and activated in BM from multiple primary cancer types. Here, we present new data demonstrating efficacy of HER2-3 combination therapy (trastuzumab+pertuzumab) in intracranial SKBr3 and MDA-MB-361 breast cancer xenografts. On the imaging side, we have developed a pertuzumab-based PET tracer (Ptz-89Zr) with favourable in vitro stability, HER2-binding affinity, and in vivo biodistribution properties. The next phase is a pilot clinical PET-MRI study in brain metastatic HER2+ breast cancer patients using the Ptz-89Zr tracer, where we aim to delineate relationships between the administered dose, uptake and retention over time, tumour size and perfusion.

We anticipate this work will provide important information about factors affecting the uptake of monoclonal antibody-based therapies in these unique tumours, and on the feasibility of applying theranostics for brain metastasis management in the future.

Can we “Starve Cancer Cells to Death” with Selective PARP14 Inhibitors?

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It has been estimated that greater than one in three people are likely to develop cancer at some point in their life. As a result cancer is the second most common cause of death in Australia and New Zealand, after cardiovascular disease. Cancer cells are believed to develop due to the accumulation of mutations within their genes, resulting in these cells growing and dividing in an uncontrolled manner. Cancer cells require a large
amount of energy, in the form of glucose, to sustain their rapid growth. Most cancerous cells grow under hypoxic conditions and have differences in their metabolism of glucose, known as the Warburg effect, to avoid apoptosis.

Poly (ADP-ribose) polymerase, member 14 (PARP14) belongs to a family of intracellular proteins that generate ADP-ribose post translational adducts. It has recently been demonstrated that PARP14 promotes the Warburg effect in hepatocellular carcinoma cells and that PARP14 levels are increased in cancer cells when compared to normal cells. In recently reported research when the PARP14 protein was blocked (using a shRNA knockdown model) the cancer cells had a significantly slower rate of growth while the normal cells growth rate was not affected.

Our research explores the structure, nature and function of PARP14 using computational chemistry techniques. By targeting TYR1620, located on the edge of the catalytic binding site, we may be able to selectively target PARP14 over the other PARP enzymes. We have designed a novel library of PARP14 inhibitors that have strong binding interactions with TYR1620. A potent inhibitor that is selective for PARP14 could potentially be able to "starve cancer to death".


Establishment of new methods to quantify the mu-opioid and TLR-4 receptor activation potential in biological samples to assess the influence of opioids on tumour metastasis

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Introduction: The possibility that opioids can influence tumour growth and metastasis is the subject of intense interest. In this study, we set up new methods to quantify the ability of opioids present in biological samples to activate the μ-opioid receptor (MOR) and toll-like receptor-4 (TLR-4). These two receptors can be activated by opioids or their metabolites, and are expressed on cancer cells as well as tumour-associated cells, and they control signalling pathways that play a key role in modulating cancer metastasis. Our objective is to establish the methods for quantifying receptor activation potential in the circulation of mice or patients administered morphine.

Methods: Alphascreen cyclic AMP (cAMP) assay and MOR overexpressing HEK293 cells have been employed to quantify the MOR activation. Cells engineered by co-transfection of the TLR-4 gene and other genes essential for TLR-4 activation (HEK-Blue™ hTLR4) were utilized to measure TLR-4 activity. Both assays were standardised using morphine, its MOR-active metabolite morphine-6 glucuronide (M6G) and its MOR-inactive, but TLR4-active metabolite morphine-3 glucuronide (M3G) in the presence/absence of serum or plasma from humans or mice. Specificity was verified using the opioid antagonists naloxone and methylnaltrexone, TLR-4 antagonist LPS-RS and TLR-4 inhibitor amnitrtyline.

Results: Plasma is preferred over serum to quantify receptor activation and the optimal amount of plasma used in both assays is 5% (V/V). Morphine and M6G in spiked mouse or human plasma exhibited MOR activation, which M3G lacked. In contrast, M3G showed moderate but consistent activation of the TLR-4.

Conclusions: These assays can be used to measure receptor activation in biological fluids. This will be useful to determine the effect and mechanism of action of administered opioids on the behaviour of cancer and non-cancer cells important in the growth and metastasis of tumours.

The impact of a Mediterranean-style dietary pattern on cancer-related fatigue and quality of life in men with prostate cancer treated with androgen deprivation therapy: A pilot study

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Background: Adopting a Mediterranean-style dietary pattern during prostate cancer treatment has the potential to mitigate cancer-related fatigue, and improve quality of life through a reduction of androgen deprivation therapy (ADT)-induced metabolic adverse side effects.

Aims: To examine the efficacy of an individualised Mediterranean-style dietary pattern for reducing cancer-related fatigue and improving quality of life in men with prostate cancer treated with ADT.

Methods: Men with prostate cancer who had received ADT for ≥3 months were randomly allocated (1:1) to usual care (UC) or an individualised Mediterranean nutrition intervention (INT) delivered by an Accredited Practising Dietitian. Fatigue [Functional Assessment of Cancer Threatment (FACT)-F], quality of life [FACT-Genera (FACT-G)] were measured at baseline and following the 8 week intervention.

Results: Twelve participants (age: 65±8.7 years, body mass index: 29.6±2.7 kg/m², time on ADT: 38.2±41.9 months) completed this RCT pilot study. Two-way repeated-measures ANOVA revealed significant differences between groups for change in total body mass (p=0.012), yet no significant differences were seen between groups in FACT-F (p=0.240), FACT-C (p=0.219) or FACT-G (p=0.399) at 8 weeks. Significant within group changes were seen in the intervention group for total body weight (-3.2±2.3; p=0.20) and FACT-G (+10.3±5.2; p=0.028) and FACT-C (+13.8±7.7; p=0.007); whilst no significant changes were seen in the usual care group.

Conclusion: This pilot study found that an 8-week individualised Mediterranean-style dietary pattern did not significantly improve fatigue or quality of life compared to UC. However, the 3-10 points change observed in the FACT-F and FACT-G indicate a clinically significant improvement in both fatigue and quality of life. Whilst a larger RCT is required to confirm these findings, individualised nutrition therapy aligned with a Mediterranean-style dietary pattern may be an effective clinical utility for the management of cancer-related fatigue and quality of life in men with prostate cancer treated with ADT.
Follow up of indeterminate lung nodules on PET-CT scan in patient with lung cancer treated with curative intent: Retrospective study

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Introduction: Indeterminate pulmonary nodule in patients with lung cancer is common clinical problem. Lung cancer screening studies of smokers at high risk for malignancy report prevalence of pulmonary nodules as high as 50 percent with epidemiological studies reporting a prevalence of incidental nodules identified on CT at 31 percent [1]. FDG-PET has diagnostic accuracy of 91% in patient with lung cancer [2]. Approximately 50% of indeterminate lung nodules for which surgery is performed for diagnosis are benign [3].

Material and Method: We retrospectively reviewed patients with stage I- III lung cancer treated at Tertiary Hospital from 2012-2014. Patients were identified through MDT from 2012-2014. We followed subsequent imaging with CT of all patients with indeterminate lung nodules.

Results: We identified 31 patients with biopsy proven lung cancer who had indeterminate lung nodules based on PET/CT review in multidisciplinary meeting. Almost half (49%) of patients had stage I disease, 11(35%) patients have stage II disease and 5 (16%) patients have stage III disease. None of patients in our study had N 3 disease. 25 patients (80 %) underwent curative surgical resection. Majority of lung nodules (60%) deemed non-significant were between 6- 10 mm and 2 patients had lung nodules between 10-15 mm. 4 (12%) patients were lost to follow up or care was transferred to another facility. Only 3 (9%) nodules deemed non-significant grew on follow up CT scans and all 3 patients had stage III disease. 1 patient out of 3 patients did not have any other disease apart, rest 2 developed metastatic disease. Conclusion: Majority of lung nodules (91%) identified on PET/CT and reviewed in lung multi-disciplinary meeting did not progress on surveillance imaging with CT scan. This is small retrospective study at single centre and we did not review SUV uptake on PET scan.

treatment-related adverse event rates for nivolumab vs docetaxel were 8% vs 56% in CheckMate 017 and 11% vs 54% in CheckMate 057, despite longer mean treatment durations with nivolumab vs docetaxel (7.5 vs 2.5 mo; 7.0 vs 3.3 mo).

**Conclusions:** With ≥2 year of follow-up, nivolumab continued to demonstrate OS benefit and high rates of durable response vs docetaxel in advanced NSCLC. Only nivolumab-treated patients had treatment ongoing and responses lasting ≥2 years. Nivolumab safety profile remained favorable vs docetaxel, with no new safety concerns identified. Reused with permission from the European Society for Medical Oncology (ESMO). This abstract was accepted at the ESMO 2016 Annual Meeting. All rights reserved. The clinical trials and abstract were sponsored by Bristol-Myers Squibb.

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**Assessing the impact of chemotherapy-induced peripheral neuropathy in Australia via a patient survey**

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Chemotherapy-induced peripheral neuropathy (CIPN) is a major side effect of cancer treatments, and can lead to long-term functional disability and reduced quality of life. Despite this, to date there has been a lack of large-scale studies into CIPN in Australia, and its impact is poorly understood. Our aim is to investigate the impact of neurotoxic chemotherapy side effects on the health, physical activity, and quality of life of Australian cancer survivors via an anonymous online survey. The survey addresses demographics, cancer diagnosis and treatment, information on the experience of CIPN and other side effects of chemotherapy, as well as including standardised measures to assess general health, quality of life, physical activity, CIPN symptoms and pain. The survey aims to recruit 2000 participants who have received neurotoxic chemotherapy. Recruitment will take place over a period of 2 years. Interim analysis of 305 respondents with a mean age of 58 ± 9.8 years indicates a greater prevalence of female responders (89.4% female, 10.6% male). Cancer types reported include primarily breast, colorectal and ovarian cancer, and chemotherapy types reported include carboplatin, paclitaxel, docetaxel and oxaliplatin, with 14% of participants unsure of the name of the chemotherapy that they had received. Of the cohort, 73% were currently experiencing neuropathic symptoms in the hands or feet. Respondents ranked neuropathy as the second most troubling side effect of cancer treatment after fatigue, with 15% of participants reporting neuropathy as having the biggest impact on their lives and 33% of participants reporting fatigue as having the biggest impact. These preliminary results support the importance of investigating this issue. This first large patient survey to specifically assess the impact of CIPN in Australia will provide important information on the impact of this debilitating condition.

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**A Retrospective Audit of End-of-Life Care in Oncology Patients at The Canberra Hospital**

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**Background:** There is a national drive towards ensuring that end-of-life (EOL) care is both high quality and tailored towards the individual needs of a patient and their family.

**Aims:** To describe current patterns of EOL care of medical oncology patients dying in an acute hospital setting.

**Methods:** A retrospective observational study was undertaken of 100 consecutive adult medical oncology inpatients dying between 1st July 2010 and 25th June 2012. Charts were reviewed for evidence of (1) resuscitation plans, (2) invasive interventions just prior to death, (3) palliative care and (4) timing of EOL care in relation to death.

**Results:** At time of death, 99% of patients had a resuscitation plan, 67% of which were completed by a member of the medical oncology team. 93% of patients were recognised to be dying, and this occurred a median of 2 days prior to death. Within 48 hours of death, active interventions were given to 70% of patients with admissions longer than 2 days. Comfort care plans were documented in 87% of patients; however, 66% of these were documented within 48 hours of death and up to 29% of these patients continued to receive non-comfort measures.

**Conclusions:** This study showed a high level of documented resuscitation plans, comfort care plans, and recognition of dying. However, active interventions were common within 48 hours of death, and comfort care plans and recognition of dying often occurred late. Improved documentation with earlier and clearer plans could improve the quality of EOL care.

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**The need for individualized care of older, frail people diagnosed with cancer. Illumination from a 65 + years cross sectional cohort**

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**Aim:** To investigate frailty and cancer diagnosis in a 65+ year cross sectional cohort and how this may influence the care of this population.

**Methods:** An ongoing South Australian study randomly selects people to answer a telephone based health questionnaire, with data being weighted for age, sex, area of residence and selection probability. Presented data is a cross section of study participants aged > 65 years from 2013-2015.
Efficacy and safety of enzalutamide versus bicalutamide in younger and older patients with metastatic castration-resistant prostate cancer in the TERRAIN trial

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9. Medivation, Inc, San Francisco, USA
10. Carolina Urologic Research Center, Myrtle Beach, USA

Aims: The phase 2 TERRAIN trial compared the efficacy and safety of enzalutamide versus bicalutamide in patients with metastatic castration-resistant prostate cancer who had progressed on luteinising hormone-releasing hormone agonist/antagonist therapy or after bilateral orchiectomy while maintaining castration therapy during the study. An age-effect analysis was pre-specified to investigate the efficacy and safety of enzalutamide versus bicalutamide. Results are presented in younger (<75 years) and older (≥75 years) patients in the TERRAIN population.

Methods: In this double-blind study in North America and Europe, patients were randomised 1:1 to enzalutamide 160 mg/day or bicalutamide 50 mg/day. The primary efficacy end point was centrally assessed progression-free survival (PFS) and a secondary efficacy end point was time to prostate-specific antigen (PSA) progression.

Results: 184 patients were randomised to enzalutamide and 191 patients to bicalutamide. 126 (68.5%) and 119 (62.3%) patients were <75, and 58 (31.5%) and 72 (37.7%) patients were ≥75, in the enzalutamide and bicalutamide arms, respectively. PFS was significantly improved with enzalutamide versus bicalutamide in patients <75 years (median 16.6 vs 5.8 months; hazard ratio [HR] 0.38 [95% confidence interval (CI) 0.27, 0.52]) and patients ≥75 years (median 13.8 vs 6.4 months; HR 0.59 [95% CI 0.37, 0.92]). Median time to PSA progression was similarly significantly improved with enzalutamide versus bicalutamide in younger (median 22.1 vs 8.2 months; HR 0.27 [95% CI 0.18, 0.40]) and older patients (median 16.6 vs 8.8 months; HR 0.33 [95% CI 0.19, 0.57]). Adverse events with enzalutamide were more frequent in older patients (98.3%) versus younger patients (92.8%), but a similar distribution of treatment-related adverse events between treatment arms was observed in either age group.

Conclusions: Enzalutamide had greater efficacy than bicalutamide regardless of age, with superior PFS and time to PSA progression. Enzalutamide showed safety consistent with its known safety profile in both age subgroups.

Understanding initiation of nutrition support in patients with head and neck cancer (HNC) and adherence to recommendations— a patient perspective

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Aims
Patients undergoing treatment for HNC often require tube feeding, however weight loss remains prevalent. The aim of this study was to investigate the impact of patient adherence to nutrition recommendations on weight loss and understand patient barriers to meeting goal enteral feeding.

Methods
Observational study in patients with HNC deemed at high nutritional risk with prophylactic gastrostomy placed prior to treatment following local protocol. Weight was recorded at placement of gastrostomy and three months post treatment. Time of recommended commencement of gastrostomy feeding by the dietitian was recorded. Patients were asked to maintain a daily record of gastrostomy intake during treatment, main nutrition impact symptom necessitating gastrostomy use, and the reasons for not meeting nutrition prescription if applicable. Adherence was defined as actual intake >75% of prescribed intake.
Safety profile of nivolumab (NIVO) and ipilimumab (IPI) combination therapy in patients with advanced melanoma (MEL)  

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Aims: Cumulative data indicate greater tumor response from the combination of NIVO+IPI in patients with MEL, but with higher frequency of adverse events (AEs) compared with either agent alone. This pooled analysis of 3 studies describes the safety profile of NIVO+IPI utilizing established guidelines for AE management.  

Methods: A retrospective safety review was conducted for phase 1–3 trials in which patients received ≥1 dose of the standard regimen, NIVO 1 mg/kg + IPI 3 mg/kg Q3W x 4, then NIVO 3 mg/kg Q2W until progression or unacceptable toxicity. Analyses included AEs, select (immune-related) AEs, time to onset and resolution, use of immune-modulating agents (IMs) for toxicity management, and effect of IMs on outcome.  

Results: Among 448 patients, median age was 61 years, and 25% had ECOG PS >0. Median duration of follow-up was 13.2 months. Treatment-related grade 3/4 AEs occurred in 55% of patients and led to discontinuation in 28%. The most frequent treatment-related select AEs of any grade were skin (64%) and gastrointestinal (47%), and of grade 3/4 were hepatic (17%) and gastrointestinal (16%); 30% developed a grade 2–4 select AE in >1 organ category. Median time to onset of grade 3/4 select AEs ranged from 3.1 (skin) to 16.3 weeks (renal). Excluding endocrine AEs, median time to resolution and resolution rates of grade 3/4 select AEs were 1.1 (renal) to 7.3 weeks (pulmonary) and 79–100%, respectively, using IMs. Four (<1%) deaths were attributed to therapy.  

Conclusions: The frequency of grade 3/4 treatment-related AEs was higher with NIVO+IPI, and time to onset of select AEs occurred earlier than with either agent alone. Resolution rates of select AEs were similar to those previously reported with IPI monotherapy.
Prognostic significance of baseline blood results for patients with stage IV non-small cell lung cancer (NSCLC) treated in South Western Sydney

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Background/Aims

Accurate prognostic information for advanced NSCLC enables doctors and patients to make appropriate treatment decisions and plans for the future. Traditional prognostic factors including performance status (PS) and stage provide broad survival estimates, but further refinement is required. We sought to determine the prognostic significance of routinely measured blood tests for patients with metastatic NSCLC.

Methods

We retrospectively reviewed electronic medical records for patients at Liverpool and Macarthur Cancer Therapy Centres diagnosed with metastatic NSCLC between 2008 and 2012. For each patient we extracted demographics, tumour characteristics and survival from date of diagnosis of metastatic disease. We defined baseline blood tests as the first test collected within 2 weeks of diagnosis and used local definitions of normal values. Associations between survival and haemoglobin, white cell count, neutrophils, lymphocytes and albumin were determined using multivariable Cox proportional hazards models.

Results

We identified 353 patients with a median age of 67 years (range 31-94), 64% were male, 88% had a smoking history, 46% had adenocarcinoma histology and 62% were ECOG PS ≤ 2. The median overall survival (OS) was 5.7 months (interquartile range 2.3 months – 11.8 months). Baseline factors independently associated with shorter OS were ECOG PS >2 (HR 2.76; 95% CI 2.1-3.6; p < 0.01); while cell count ≤ 11 x 10^9/L (HR 1.49; 95% CI 1.1-1.9; p < 0.01); albumin ≤ 38 g/L (HR 1.41; 95% CI 1.1-1.8; p < 0.01) and Asian birthplace (HR 1.65; 95% CI 1.1-2.5; p < 0.01).

Conclusions

Our results confirm that leucocytosis and hypobulbinaemia are independently significant for prognosis and may be useful to consider along with ECOG PS when estimating survival for patients with stage IV NSCLC.
Safety data from an expanded access program (EAP) of nivolumab (NIVO) in combination with ipilimumab (IPI) in patients with advanced melanoma (MEL)

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Aims: In a phase 3 trial (CheckMate 067), NIVO and IPI combination showed longer progression-free survival in patients with MEL, although treatment-related grade 3/4 adverse events (AEs) were more common with NIVO+IPI than with NIVO or IPI. We report safety data from an EAP of NIVO+IPI in MEL patients (CheckMate 218).

Methods: Patients received NIVO 1 mg/kg + IPI 3 mg/kg Q3W x 4, then NIVO 3 mg/kg Q2W until progression or up to 48 weeks. Assessments included incidence of treatment-related AEs and select (immune-related) AEs from the first 6 months (database lock: November 2015).

Results: Among 252 patients, median age was 59 years, 68% were male, 29% received ≥1 prior therapy, 98% had ECOG PS of 0-1, 77% had stage IV MEL, and 50% had M1c. Median number of NIVO and IPI doses received were 3.5 (1-22) and 3 (1-4), respectively. After treatment with NIVO+IPI, 39% patients continued to receive NIVO alone. 106/252 pts (42%) are still on treatment. Treatment-related AEs of any grade were reported in 93% patients and grade 3/4 in 52%. The most common grade 3/4 select AEs were gastrointestinal (18%) and hepatic (14%). Less common were skin (3%), renal (2%), and endocrine (2%) AEs: pancreatitis and pneumonitis occurred at <1%. No treatment-related deaths were reported. Median time to onset for treatment-related grade 3/4 gastrointestinal and hepatic AEs was 6.6 (0.4-16.1) and 8.6 (1.0-17.0) weeks, respectively. Treatment-related grade 3/4 AEs leading to discontinuation were reported in 23% patients.

Conclusions: In this EAP, patient demographics were similar to those reported in CheckMate 067, except that there were patients in the EAP who received prior therapies for MEL. The overall safety profile was consistent with prior clinical trial.

Pembrolizumab for metastatic melanoma in renal allograft recipient with subsequent graft rejection and treatment response failure, a case report

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BACKGROUND
Programmed cell death protein 1 (PD-1) immune checkpoint inhibitors are an effective first line treatment for metastatic melanoma as it has shown to improve overall survival. Organ transplant recipients are at an increased risk of allograft rejection with limited safety and efficacy data as most of these patients were excluded from phase 3 clinical trials.

CASE PRESENTATION
A 57 years old man received a deceased donor renal allograft for end stage renal disease in 2001. He has been on Tacrolimus and mycophenolate mofetil over the past 13 years with normal renal function. He noticed a rapidly enlarged fungating skin lesion over the right scapula over 3 months. A biopsy confirmed malignant melanoma with no BRAF mutation. Staging CT showed widespread metastases involving the liver and bones. His immunosuppressants were changed to azathioprine and everolimus prior to commencement of pembrolizumab 2mg/kg every 3 weeks.

After two cycles of pembrolizumab, he continued to deteriorate with functional decline and clinically progression of right scapular subcutaneous lesions. Similarly, his renal function worsened rapidly with creatinine > 250 umol/L. Given his poor prognosis and declined haemodialysis, he was transferred to the hospice for best supportive care.

DISCUSSION
To the best of our knowledge, there has been no case report describing first line PD-1 inhibitor for the management of metastatic melanoma on a renal transplant recipient which subsequent leads to graft rejection and rapid treatment failure. Early evidence has shown a high level of PD-L1 receptor expressed in renal tubules and is responsible for transplant tolerance. Therefore, by blocking with PD-1 inhibitor can accelerate graft failure. Furthermore, there is limited data to help select the appropriate immunosuppressant at the time of initiation of immune checkpoint inhibitor. Recent case reports have documented a graft failure following administration of PD-1 inhibitor as compared to successful maintenance of graft with anti-CTLA4 antibody ipilimumab. Our case highlights the risk of treatment failure and allograft rejection in renal transplant patients treated with anti-PD1 agents. Physician will need to make careful selection of immune checkpoint blockade and discuss risk-benefit with transplant recipients.
Pneumocystis pneumonia (PJP) in lung cancer patients

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Introduction
Despite emerging risk of PJP in the era of new anti-cancer drugs, early diagnosis can be challenging. Rate of mortality in non-AIDS patients is 35-50%, with highest risk among cancer patients.

Objectives
To determine the incidence, outcomes and predictors of mortality of PJP in cancer patients and to describe features that differentiate PJP from other inflammatory/infected conditions or pulmonary toxicities related to anti-cancer treatments.

Methods
We conducted a single-centre retrospective chart review to identify all lung cancer patients with a clinical diagnosis of suspected PJP between January 2011 and December 2015. Proven PJP was defined as positive microbiological test of induced sputum. The associations between categorical variables were assessed using Pearson’s Chi squared, Fisher’s exact and independent sample t-tests.

Results
Among 31 lung cancer patients with suspected PJP, 10 patients had confirmed diagnosis (Table 1). All were treated with trimethoprim-sulfamethoxazole and short course of corticosteroids. Clinical presentations commonly included new or worsening dyspnea, cough, and fever. Median time from commencing anti-cancer treatment to developing PJP was 2 months. Most patients received ganciclovir-based chemotherapy. Five patients fully recovered after treatment initiation while 5 patients died (50% mortality rate in confirmed cases). Length of stay (LOS) was shorter in non-survivors due to acute deterioration during hospitalization (Table 2). Factors associated with mortality were ECOG ≥2 and acute respiratory failure.

Clinical presentations, corticosteroid use, laboratory findings and LOS were similar between PJP and non-PJP cases. Radiological findings of diffuse interstitial infiltrates were more common in PJP group. Other diagnoses include pneumonia, pulmonary embolism, lung cancer progression and pneumonitis.

Conclusion
PJP in lung cancer patients receiving treatment is associated with high mortality, particularly in patients with poor performance status and poor ECOG. Clinical presentations may resemble other pulmonary conditions therefore high clinical suspicion and confirmatory diagnosis is warranted.

Disclosure
Authors have no financial disclosure or conflict of interest.

Nivolumab in previously treated Advanced Non-small Cell Lung Cancer- Calvary Mater Newcastle (CMN) Experience

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Background
Nivolumab, a PD-1 immune-checkpoint inhibitor, has shown overall survival benefit when compared to docetaxel in previously treated advanced squamous-cell and non-squamous cell NSCLC12.

Methods:
A retrospective, descriptive analysis was carried out on 21 patients who received Nivolumab on compassionate access program at CMN from July 2015 to April 2016 .

Results:
The median age of patients was 62 years (range 28-80), 12 patients were female (57%) and 9 (42%) were male. 17 (81%) had been diagnosed with adenocarcinoma and 4 (19%) with squamous cell carcinoma. 4 patients had brain metastases. 19 patients (90%) had previously been treated with carboplatin and gemcitabine. 11 patients (52%) had previously received pemetrexed. 2 patients had prior treatment with tyrosine kinase inhibitors. 9 received nivolumab as 2nd line therapy, 7 patients received as third line and 5 patients as fourth line. 2 (10%) patients had a partial response and 10 (48%) stable disease with DCR of 57%. 9 (42%) had disease progression on first assessment. Pseudo-progression was seen in 4 patients (19%). Treatment is ongoing in 9 patients (42%) (duration of therapy ranging from 5 to 13 months). Treatment was discontinued in 11 patients (52%) due to disease progression.

Toxicities, of any grade, were reported in 12 patients (57%). Development of rash was the most frequent toxicity experienced (5 patients; 24%). Grade 3 pruritus, pneumonitis, rash and fatigue were experienced. One patient required a psychiatric admission in the absence of previous history of psychiatric illness. No patients discontinued treatment due to toxicity.

Conclusion:
1. Nivolumab is a relatively well tolerated and an effective treatment in clinical practice outside of trial setting.
2. Nivolumab appears to be beneficial even in heavily pre-treated patients with advanced NSCLC.

**Frequency of venous thromboembolism and its association to Khorana risk score in patients receiving chemotherapy at Goulburn Valley Health**

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**Background:**
The overall risk of VTE in the setting of malignancy is 4-8%, and up to 20% in high risk cancer populations (gastric, pancreatic and lung). Thrombosis is a common cause of death in cancer patients and potentially can be reduced with prophylactic anticoagulation, but side effects such as risk of bleeding, and cost need to be considered. It is important to risk-stratify patients to identify high-risk groups who are likely to get the most benefit with least harm.

**Methods:**
Retrospective audit of oncology patients at Goulburn Valley Health who received chemotherapy between June 2014 and July 2016 and were diagnosed with VTE (deep venous thrombosis and/or pulmonary embolism). Patients were identified using oncology and pharmacy databases. Electronic and hardcopy of clinical records of eligible patients were assessed for demographic and clinical variables needed to apply the Khorana predictive risk model for chemotherapy-associated VTE.

**Results:**
In the studied 26-month period 58 patients were diagnosed with VTE. Median age was 70 years old (35–90 years old), and 32 patients (55%) were male. Cancer types most commonly associated to VTE were colorectal (26 patients, 45%), breast (9 patients, 15%) and lung (9 patients, 15%). 51 patients (88%) were ECOG 0 or 1. Pulmonary embolism was diagnosed in 25 patients (43%) and high Khorana score (3 or 4) was only identified in 3 patients (5%).

**Conclusion:**
Frequency of VTE in patients receiving chemotherapy in the regional setting is in keeping with international literature. Types of cancer associated with VTE were colorectal, breast and lung, however this is most likely related its frequent presentation rather than biology. There was no association of high Khorana scores (3-4) with risk of VTE.

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**Microwave ablation versus Radiofrequency ablation for Hepatocellular Carcinoma: a Systematic Review and Meta-analysis of Randomised Controlled Trials**

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**Background and aims:** While radiofrequency ablation (RFA) is the current standard local ablative modality for early stage hepatocellular carcinoma (HCC), more recently microwave ablation (MWA) is being increasingly used because of its potential advantages. However, it is unclear as to whether MWA achieves similar efficacy and safety outcomes. We conducted a systematic review and meta-analysis to evaluate the efficacy and safety of MWA versus RFA as treatment of HCC. Methods: A systematic search of MEDLINE, EMBASE, and Cochrane CENTRAL from inception until October 2015 was conducted. Only randomised controlled trials (RCT’s) investigating the efficacy and safety of RFA versus MWA as treatment of HCC were included with no language and time limitations. The selection of trials, data extraction and the assessment of bias were performed by two independent review authors. Risk ratio (RR) with 95% confidence intervals (CI) was calculated as the relevant effect measure to analyse complete ablation, local recurrence rates, and safety. Results: Three studies involving 225 patients and 264 nodules (5 cm) were identified. No difference found in complete ablation rates between MWA and RFA; the pooled RR (95%CI) was 0.99 (0.93-1.05) with no significant inter-study heterogeneity observed (I²=0%). There was no difference in local recurrence and major complications rates between MWA and RFA; the pooled RR was 0.94 (0.30-2.87) and 0.95 (0.07-13.05) with significant inter-study heterogeneity present (I²=63%) and (I²=74%) respectively.
Similar results were found on sensitivity analysis evaluating the two studies of higher quality. Conclusions: This systematic review and meta-analysis demonstrates that the efficacy and safety of MWA appears similar to that of RFA for the treatment of HCC with no significant differences observed in rates of complete ablation, local recurrence and major complications. However, given the low quality of evidence overall and significant inter-study heterogeneity further data is needed via high quality RCT’s.

Electronic MDT Workflow

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Background:
Multidisciplinary Team (MDT) meetings are pivotal in cancer care services. An electronic MDT workflow needed to be introduced to enhance information capture and sharing amongst care providers as part of the implementation of IOIMS (Integrated Oncology Information Management System - based on MOSAIC) at four Queensland Health regional cancer services

Aims:
The overall objective was to migrate users from paper based records & processes to an electronic MDT workflow. The workflow includes appointments, pre MDT workup, reports, assessment and MBS code capture. The end result is a totally pre-populated MDT Treatment summary that aligns to the Qld Health standard.

Methods:
Analysis was undertaken of existing MDT workflows and associated documentation. A workflow was designed, documented and built that drew data from demographics, diagnosis fields and a custom MDT assessment. Upon completion of the appointment in IOIMS, the software generates a word document that is presented on the users’ work list for review, printing and filing in the patient record.

Results:
The MDT functionality has been used successfully since late 2015. The MDT coordinator displays IOIMS at the MDT meetings where live data entry can occur. The entirely pre-populated MDT Treatment Summary document is posted to the referring GP to ensure timely communication. Code capture of the MBS items is part of the routine workflow and can generate significant income – however alignment with the current MBS guidelines can be problematic due to duration, consent and the requirement to obtain patient signatures to claim.

Conclusions:
MDTs have been around for many years – however transitioning from a traditional clinical discussion to broader information collection and standardisation requires engagement and planning. The complete MDT workflow was created in IOIMS which benefits not only local users but also the broader community involved in the patients’ care.

'Real world' pembrolizumab in metastatic melanoma

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Aim:
We retrospectively reviewed all patients with metastatic melanoma treated with pembrolizumab in our institution in a 12 month period between 1st June 2015 and 1st June 2016. We aimed to identify the overall response rate (CR & PR), ongoing response rate and clinical benefit rate (CR, PR & SD) after 4 cycles of pembrolizumab for comparison with prospective published clinical trials.

Methods:
We identified patients using ICD codes for melanoma and cross-linked this with our pharmacy record of pembrolizumab administration. All patients with metastatic melanoma given at least 1 cycle of pembrolizumab 2mg/kg every 3 weeks between 1/6/15 and 1/6/16 were included. Clinical data was sourced from the patients’ electronic medical record and response was determined by immune-related response criteria.

Results:
77 patients were identified. Baseline characteristics: 52M:25F; median age 72y (range 39-90); 54 cutaneous primary site (70%), 12 unknown primary site, 3 ocular primary site, 2 mucosal primary site; 56 mutation wild type (73%), BRAF mutations in 15 patients, NRAS mutations 5 patients; 24 patients had brain metastasis (31%); pembrolizumab was first line treatment in 59 patients (77%); 4 patients had Grade 3/4 toxicity (5.2%).

Overall response (CR & PR) in 33 patients (43%); Responses were ongoing in 27 of 33 patients (82%) after a median follow-up of 5.3 months (3-426 days)

Clinical benefit (CR, PR & SD) in 43 patients (55.8%) after 4 cycles of pembrolizumab; Median 6 month progression free survival and estimated 1 year survival benefit expected by November 2016

Conclusions:
Unlike ‘real world’ audits of chemotherapy benefit, our single institution experience of pembrolizumab in metastatic melanoma revealed comparative efficacy in overall response rate and clinical benefit rate after 4 cycles of pembrolizumab compared with published clinical trials. This is despite an older cohort of patients with a higher rate of brain metastasis using a lower dose of pembrolizumab. We hypothesize this result may be due to the high percentage of patients treated with pembrolizumab in the first line, though prospective clinical trials are needed to confirm this.
Parkinsonism and encephalopathy associated with Pembrolizumab: A case report.

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Background and rationale
Pembrolizumab is associated with immune related adverse events (irAEs). Neurological irAEs are rare and difficult to diagnose (1). We describe a case of encephalopathy manifesting as visual hallucinations in addition to parkinsonian symptoms in the context of Pembrolizumab use for stage 4 metastatic melanoma.

Case Report and Discussion
A 66 year old male with stage 4 BRAF wild-type metastatic melanoma involving the liver and lung and left parotid presented with distressing visual hallucinations after 11 doses of Pembrolizumab. Pembrolizumab was started on August 26th 2015 with complete response to the parotid lesion and partial response in other metastatic sites. Hallucinations were composed of seeing people, animals and real objects moving. There were features of parkinsonism on examination in addition to a trunk and bilateral leg rash. Brain MRI, autoimmune encephalitis antibodies and lumbar puncture was negative for infective or inflammatory pathology. Electroencephalogram showed changes in keeping with a form of encephalopathy. The mini mental state examination was 28/30.

A therapeutic trial of prednisolone at 1mg/kg for 2 weeks with a slowly tapering regimen in addition to cessation of Pembrolizumab arrested visual hallucinations. The parkinsonism persisted and a diagnosis of idiopathic parkinsons disease was made. Postulated mechanisms are irAEs are involved in both the encephalopathy and uncovering of parkinsonian symptoms.

Conclusion
This case highlights the coexistence of neurological irAEs and an idiopathic neurological disorder in a patient treated with Pembrolizumab is a diagnostic challenge. Pembrolizumab therapy may reveal new disease in predisposed patients in addition to irAEs.

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Rare subcutaneous infusion port (SIP) complications in oncology: A case series.

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Background and rationale
Central venous access is a common requirement in oncology for administration of chemotherapy and laboratory monitoring. A subcutaneous infusion port (SIP), consists of a subcutaneous reservoir connected to a catheter inserted into a central vein. This invasive line is inserted using the modified Seldinger technique together with surgical fashioning of a subcutaneous pocket superior to the pectoralis fascia for the reservoir. SIPs can be associated with a number of complications, the most common being line infection and thrombosis (1). There are reports of significant morbidity associated with SIPs in the oncology patient (2). SIPs are inserted at our centre for patients with breast and colorectal cancer.

Methods
Random selection of patients with serious SIP related complications over a 6 year period.

Discussion
We describe a series of 4 cases of rare SIP complications. The complications are intra-pleural cannulation with subsequent intra-pleural chemotherapy delivery, intra-arterial cannulation causing stroke requiring vascular surgical intervention, catheter fracture requiring endovascular retrieval from the right atrium and catheter migration into subcutaneous tissue. The morbidity of the complications was significant. Xray imaging and SIP fluoroscopy studies were helpful ascertaining catheter location and regional anatomy. There was no SIP complication related mortality in this series.

Conclusion
Although rare, SIP complications can be severe. SIP complication awareness and general management is an essential component of clinical care in oncology for both senior and junior doctors. In particular, re-assessment of catheter position if there is difficulty in access.

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Sexual inactivity among female cancer survivors

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Aims: To determine the prevalence of sexual inactivity in female cancer survivors seeking treatment for menopausal symptoms, and to assess the role of vaginal dryness and pain in sexual inactivity.

Methods: Data were collected for all first visits to the Menopause Symptoms After Cancer (MSAC) clinic of the King Edward Hospital, from 2003-2010. Participants completed the Fallowfield Sexual Activity Questionnaire (SAQ), to report current sexual activity status and, for inactive women, reasons for inactivity. Participants also reported severity of vaginal and sexual symptoms (vaginal dryness, itching/irritation, bleeding/spotting, discharge; loss of interest in sex; pain or discomfort with intercourse; sexual dissatisfaction) with the Functional Assessment of Cancer Therapy (FACT) Scales.

Results: Of 428 women who completed the SAQ, 179 (42%) were not sexually active. The most common reasons for inactivity were lacking interest in sex (n=95, 53%), not having a partner (n=73, 41%), being too tired (n=59, 33%), and having a physical problem making sexual relations difficult or uncomfortable (n=37, 21%). Among sexually inactive women, severe vaginal dryness and pain with intercourse were more common among those who listed a physical problem as a reason for their inactivity than those who did not (dryness: n=21, 60% v. n=27, 20%, p=0.015; pain with intercourse: n=19, 59% v. n=16, 16%, p=0.001). Other vaginal symptoms did not differ. Severe loss of interest in sex and sexual dissatisfaction were more common among those who attributed inactivity to a physical problem than those who did not but differences did not reach statistical significance (loss of interest: n=22, 65% v. n=59, 47%, p=0.07; dissatisfaction: n=28, 85% v. n=80, 70%, p=0.09).

Conclusions: In this population, inactivity due to physical problems is related to vaginal dryness and pain with intercourse. Many sexually inactive women, irrespective of the reason, are dissatisfied with their sexual lives.

Subtype-specific activity in liposarcoma (LPS) patients (pts) from a phase 3, open-label, randomized study of eribulin (ERI) versus dacarbazine (DTIC) in pts with advanced LPS and leiomyosarcoma (LMS).

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Aims: A phase 3 study (Schöffski et al. Lancet 2016) comparing ERI with DTIC in pts with advanced LPS or LMS, showed a significant improvement in overall survival (OS) for the ERI arm. This subgroup analysis evaluated ERI in LPS pts.

Methods: Pts aged ≥18 yrs with advanced dedifferentiated, myxoid, round cell, or pleomorphic LPS incurable by multimodality therapy were included. Pts with ECOG status ≤2 and ≥2 prior systemic treatment regimens, including an anthracycline, were randomized 1:1 to ERI (1.4 mg/m², IV on D1 and D8) or DTIC (850, 1000, or 1200 mg/m², IV on D1) every 21-D until disease progression. OS, progression free survival (PFS), and safety were evaluated.

Results: 143 pts with LPS (45% dedifferentiated, 39% myxoid/round cell, 16% pleomorphic), representing 32% of the total study population, were included in this pre-planned analysis (71 ERI; 72 DTIC). Median OS for LPS pts receiving ERI vs DTIC was 15.6 vs 8.4 mo (HR=0.51, [95% CI 0.35 0.75]; P=0.001). OS benefit with ERI vs DTIC was observed independent of LPS histology (dedifferentiated—18.0 vs 8.1 mo, HR=0.43 [95% CI 0.23, 0.79]; myxoid/round cell—13.5 vs. 9.6 mo, HR=0.79 [95% CI 0.42, 1.49]; pleomorphic—22.2 vs 6.7 mo, HR=0.18 [95% CI 0.04, 0.85]) and geographic region. PFS in LPS pts for ERI vs DTIC was improved (2.9 vs 1.7 mo, HR=0.52, [95% CI 0.35–0.78]; P=0.002).

The mean number of treatment cycles for ERI vs DTIC was 6.5 and 3.2, respectively. Most frequent AEs in the ERI arm were alopecia (40%), fatigue (40%), and neutropenia (39%), AEs of ≥grade 3 occurred in 63% and 51% of LPS pts in the ERI and DTIC arms, respectively.

Conclusions: ERI was associated with a significant benefit in OS and PFS compared with DTIC in LPS pts and represents an active agent against LPS.

Cancer Registry Data on the initial 389 cancer patients seen at Aga Khan Hospital, a private hospital in Dar es Salaam, Tanzania.

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Background: Cancer remains an under-recognized health condition throughout most of Africa, and improved surveillance systems for determining cancer incidence, mortality, and prevalence of risk factors are in dire need. Collection of epidemiologic data through cancer registration is the first step in positioning a population to address its cancer burden.
Currently, only 11% of the population on the African continent is covered by cancer registries many of which are of suboptimal quality. In 2010, Tanzania Cancer Registry Steering Committee was formed to begin to address these surveillance issues in Tanzania with the aim to rebuild a population based cancer registry in Dar-es-salaam.

On July 1st, 2014, Cancer Registry Program was established at Aga Khan Health Services, Tanzania. The project was established with the aim of developing a comprehensive surveillance strategy in developing a population based cancer registry in a private hospital setting and a national setting in order to understand and compare the cancer cases seen at both institutions.

**Purpose:** To understand the cancer cases seen in a private hospital setting in East Africa and to compare this with the national cancer registry data.

**Method:** Cancer Registry Program was established on July 1st, 2014, at Aga Khan Health Services, Tanzania (AKHST), a private, non-profit organization located in Dares Salaam. Initial 389 cases were captured, and compared this with the government’s cancer registry data to know the difference.

**Results:** Top three cancers in male were Prostate, Colorectal, and Non-Hodgkin’s lymphoma. Top three cancers in females were Breast, Cervix and Colorectal Cancers. Most common age group was between 50 and 69 years, accounting for 48% of all cases. This is older than the median age recorded in cancer cases in Tanzania.

**Findings:** Breast Cancer was the most common in women, and prostate cancer in men. Most (61%) of all cases were stage III/IV. Fewer Kaposi Sarcoma and Cervical Cancers seen in our private hospital, as compared to that noted in National Cancer registry, is secondarily to higher socioeconomic status, noted in the patients visiting our hospital. It has been noted somewhat older patients than that seen in our national cancer registry, similar to that seen in the west. However, most of the cases were advanced; 33% were stage IV, and 28% were stage III. Advanced cancers are also seen in other areas of East Africa as well. Only a few (<10%) were picked up via cancer screening methods, the rest, being picked up due to physical findings or symptoms, necessitating workup. Cancer prevention and screening East Africa are mainstay in future control of the potential cancer epidemic expected in the years ahead.

**Report:** Nearly 60% of all cancers seen were treated with chemotherapy; surgery was offered to 34% of cases, whereas radiotherapy was received by 15% of all patients. Some 22% of our patients were treated with supportive/palliative care only.

It was found that esophageal cancers, Kaposi sarcoma, and lymphomas, were fewer those reported elsewhere in the region. This is owing to fewer seropositive cases we see, and better socioeconomic and education levels of patients we see in our private hospital. And lung cancer, reported high globally, were also fewer. This was similar to the other centers here, and we think that this is because of lower tobacco consumption here in East Africa. Also, this might however change over time, as the flow of tobacco consumption into this region is expected to raise. So the raise in tobacco related malignancies in East Africa is just a matter of time. However, chewing tobacco is quite common and 6% of all cancers, both in men and women, were head and neck cancers. In some recently conducted cancer screening camps in various regions conducted by the hospital, in collaboration of the Ismaili community, we did include buccal cancer screening and used the opportunity to counsel the patients against the hazards of tobacco use.

A relatively more percentage of colorectal cancers are seen (25% on men, and 18% in women) in our hospital as compared to the government hospitals; thanks to our robust Gastroenterology services. The better socio-economic status leading to life style modification as potential risk factor to colorectal cancers might be another reason. We’ve recently concluded colorectal cancer screening in a community in Dar, with stool for blood test checking. This camp also screened for other cancers, including prostate, cervix, breast and mouth/buccal.

There were 3% myelomas, 5% lymphomas, 5% sarcomas, and 7% lymphomas noted in our pathology breakdown. Nearly 78% were carcinomas. I would have expected to see more KS and HIV related lymphomas, but the truth is we see fewer HIV related malignancies that the government hospitals. That reflects on better economical and education levels of the patients seen in this private hospital.

Leukemias/Mylomlas were high, 14% in men and 15% in women. This might be explainable to better laboratory capacity we have at the Aga Khan Hospital.

### A single centres experience of cardiac metastasis from neuroendocrine tumours (NET).

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**Introduction:** Cardiac metastasis from NET are rare with little information to guide management strategies. Previous case reports discuss varying strategies including observation, somatostatin analogues (SSA), chemotherapy, radiotherapy and resection. We present a single institution experience of managing such cardiac metastases.

**Methods:** We retrospectively searched the NET multidisciplinary database at a single centre in Queensland, Australia over the period of 2007 to 2015.

**Results:** Out of 194 patients we found 4 with intra-cardiac metastases and 8 others with para-cardiac metastases. Of the intra-cardiac metastasis, all patients had a grade 1 small bowel primary NET with multiple sites of metastases. Cardiac metastasis was always diagnosed on routine imaging with gallium-68 DOTATATE PET imaging. Of the four patients, one patient did not receive SSA and was managed with observation alone. One patient, who had progressive peritoneal metastases on SSA, received four cycles of Peptide Receptor Radionucleotide Therapy (PRRT) with lutetium-177 DOTATATE, but in Tanzania demands a long duration of 2 years post diagnosis of cardiac metastasis, all patients are alive with stable disease and no cardiac complications.

**Conclusion:** With better diagnostic techniques cardiac metastases from NET are more likely to be diagnosed incidentally. Our experience suggests they can be managed with observation, SSA or PRRT without cardiac sequelae.
Nutrition outcomes and toxicities following helical-intensity modulated radiotherapy (H-IMRT) in patients with head and neck cancer

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Background. Radiotherapy associated toxicities and weight loss is common in patients with head and neck cancer (HNC). Helical-intensity modulated radiotherapy (H-IMRT) is a relatively new technique used in treatment. The aim of this study was to determine the association between nutrition outcomes and toxicities following H-IMRT in patients with HNC.

Methods. A prospective cohort of patients with HNC receiving H-IMRT were recruited over 14 months. The outcomes for patients predicted as low nutritional risk according to local protocol were analysed. Data collected include patient characteristics, toxicities (graded 0, 1, ≥ 2 using the CTCAE version 4.0), weight, diet texture and enteral feeding. Primary outcomes were percentage weight change from start to end of treatment and diet texture at the final week of treatment. One-way ANOVA, Welch ANOVA, Chi-squared and Fisher’s Exact tests were used to examine associations with grades of toxicities at the final week of treatment (P < 0.05).

Results. Final sample (n=84) with 74% male and median age 66 years. Weight loss (mean, 3.9%; 95% CI, 3.1%–4.9%) was associated with histology, treatment modality, diet texture and toxicities (pharyngeal mucositis, dysgeusia, xerostomia, salivary duct inflammation, nausea and dysphagia) but not with tumour site or staging. 35% of patients had clinically significant weight loss ≥ 5% which was associated with grade ≥ 2 nausea, dysgeusia and pharyngeal mucositis. Grade ≥ 2 oral and pharyngeal mucositis, xerostomia, salivary duct inflammation and dysphagia were associated with texture modified diet (minced, pureed or liquids).

Conclusions. For patients predicted as low nutritional risk treated with H-IMRT, grade ≥ 2 nausea, dysgeusia or pharyngeal mucositis can identify patients at risk of weight loss ≥ 5%. Frequent monitoring of toxicities, weight and diet texture is recommended to identify patients requiring dietetic intervention to minimise weight loss and ensure nutritional adequacy of texture modified diets.

Mortality within 30 days of receiving chemotherapy for malignant pleural mesothelioma in a single metropolitan oncology unit

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Background

Chemotherapy can offer an improvement in survival and cancer related symptoms. However, a proportion of patient do not receive benefit from treatment and may die from complications of chemotherapy. Several centres have demonstrated 30-day mortality rates ranging from 3.4% - 8.1%. We report our 30-day mortality for patients with Malignant Pleural Mesothelioma at Sir Charles Gairdner Hospital.

Methods

An audit was undertaken at Sir Charles Gairdner Hospital (SCGH) between January 2012 and August 2016. Date of death was extra with patients from SCGH and correlated with date of treatment given through our pharmacy dispensary database.

Results

We identified 186 patients in our IASLC database. 6 patients died (4.1%) within 30 days of receiving chemotherapy. 3 patients received 1st line treatment (2 patients had carboplatin/pemetrexed, 1 patient had cisplatin/pemetrexed), 3 patients received 2nd line treatment (2 patients had vinorelbine, 1 patient had gemcitabine). 1 death was related to treatment complications (febrile neutropenia and sepsicaemia), 4 were due to progression of disease, 1 unrelated to both treatment and progression of disease.

Conclusion

Our audit shows that a small number of patients die within 30 days of receiving treatment with a very low rate due to complications of treatment. Our results are similar with other published data. Further similar audits would be helpful to establish a standard benchmark.

Nivolumab experience in pre-treated patients with metastatic non-small cell lung cancer (NSCLC) in the Northern Territory.

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Aims:

Current studies have shown that second line Nivolumab, a PD1-inhibitor monoclonal antibody, has improved outcomes in stage IV NSCLC patients. It is available on compassionate access for second line therapy in metastatic NSCLC, while it is PBS subsidised in Melanoma. We look at our experience with Nivolumab at the Alan Walker Cancer Care Centre in the Northern Territory.

Methods:

Patients with metastatic NSCLC on second line Nivolumab were recruited between November 2015 to June 2016 and were observed for tumour regression measured by RECIST radiological criteria on a staging scan performed on average 8 weeks after commencement of Nivolumab, adverse effects and survival.

Results:
12 patients received Nivolumab; 11 consented, 9(82%) were male and 1 was of indigenous background. Their ages ranged from 45 to 78 (Median age 68). 9(82%) had adenocarcinoma and 2(18%) were EGFR mutant. 2(18%) were heavily pre-treated with 3 lines of therapy prior to Nivolumab. Out of the 11 patients, 1 patient showed partial regression, 6 showed stable disease and 4 progressed according to RECIST criteria. Overall response rate was 9%. Only 2 patients are on ongoing therapy. 1 EGFR-mutant patient progressed on Nivolumab. 7(64%) patients experienced adverse effects, 4(57%) of which had treatment ceased due to immune-related toxicity (2 had Grade 3 pneumonitis, 1 had colitis, 1 had an infusion reaction). All toxicities were reversible with steroid administration. 5 patients died from progressive disease, making survival a mean of 22 weeks from commencement of Nivolumab. 2 months survival was 27%. Further information on survival will be published once mature data is available.

Conclusion:

Our study population was small and response to therapy was unpredictable. We noticed a higher number of toxicities compared to published data, however all toxicities were reversible with prompt usage of systemic steroids. Prognostic and predictive biomarkers markers would be helpful in selecting patients to optimise response and avoid toxicity.


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Preliminary results from an ongoing prospective cohort study of scalp hypothermia in the prevention of chemotherapy induced alopecia in rural New South Wales

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Clinical trials suggest that scalp hypothermia significantly reduces the risk of chemotherapy induced alopecia (CIA) from 75.9% in control groups to 28.9% in those who have scalp cooling (RR=0.38, 95% CI = 0.32-0.45). The results of these trials are difficult to interpret however, due to variable cooling devices, cooling times, chemotherapy regimens, and definitions of alopecia as well as small study designs. This ongoing prospective cohort study allocated 20 consenting patients, who received 11 varying chemotherapy regimens, to scalp cooling using the Paxman Orbis II device during their treatment. Each patient underwent scalp cooling for 30 minutes before administration of chemotherapy, during their infusion, and for 90 minutes after their infusion completed. The degree of hair loss was assessed using the WHO and Deans alopecia scale, digital photography and a patient self-reporting questionnaire. This was done prior to the start of each cycle of chemotherapy, as well as 3 weeks and 3 months following each patient’s final treatment. Alopecia was defined as a WHO / Deans grade of 2 or more. Six patients withdrew due to grade 2/3 alopecia and an additional three patients, who completed treatment with scalp cooling, developed grade 2 alopecia. Of note six patients treated so far with FEC (as part of the FEC-D protocol) or weekly paclitaxel developed grade 2/3 alopecia, and four patients treated with carboplatin / paclitaxel or TCH completed treatment with either grade 1 or no alopecia. 5 patients withdrew from study due to discomfort, but otherwise no adverse effects were associated with scalp cooling. Our study so far suggests that scalp hypothermia using modern scalp cooling systems represents a safe and effective method of reducing rates of CIA. Further clinical trials are required to indicate which patients / chemotherapy regimens will obtain maximal efficacy from scalp hypothermia in preventing CIA.

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Trans-arterial chemoembolization (TACE) in patients with hepatocellular carcinoma (HCC): Experience from an Australian tertiary care centre

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Aim

To evaluate TACE procedures regarding its efficacy and safety in our local institution; and identify possible predictors for TACE therapy that influence outcomes.

Methods

A retrospective analysis of 84 patients who received treatment with TACE for HCC between 2007 and 2015 at our centre was performed. Primary outcomes measured were progression-free survival, overall survival and complication rates.

Results

The median progression-free survival was 12.0 months, with median overall survival time being 30.7 months. An alpha-fetoprotein (AFP) response ratio of greater than 50% was associated with better progression-free and overall survival. The patient’s Child-Pugh score and unilobar involvement also correlated with overall survival in multivariate analysis. No significant post procedural complications were encountered.

Conclusions

TACE is safe and effective in the management of HCC. A fall of 50% in AFP after TACE was predictive of better progression-free and overall survival.
An Australian experience of the use of Uridine Triacetate (Vistogard®) antidote for severe capecitabine toxicity- A Case Report

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PD-L1 expression as a biomarker for nivolumab (NIVO) plus ipilimumab (IPI) and NIVO alone in advanced melanoma (MEL): A pooled analysis

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Aims: NIVO+IPI and NIVO have superior clinical activity vs IPI in MEL patients, irrespective of PD-L1 tumor expression. We describe PD-L1 as a biomarker for NIVO+IPI and NIVO efficacy across phase 2 (CheckMate 069) and phase 3 (CheckMate 066/067) trials.

Methods: Patients (N=832) received NIVO 1 mg/kg + IPI 3 mg/kg Q3W for 17 doses at 1g/m2 bd days 1-14, with grade 3 orogenital mucositis, diarrhoea and neutropenia, grade 2 thrombocytopenia and anaemia, and grade 1 palmar-plantar syndrome. Capecitabine was self-ceased on D9 due to significant toxicity. PD-PD deficieny was suspected (formal test result pending). UT was sourced after 48 hours from Wellstat therapeutics in the US, but required overnight email and phone calls to the US by 3 senior hospital staff and significant courier costs. UT was administered via nasogastric tube for 17 doses at 10g 6-hourly starting 129 hours from the last capecitabine dose. Worst toxicities during admission were grade 4 hypovolaemic shock, febrile neutropenia (requiring filgrastim), diarrhoea and mucositis, grade 3 hypoxia from pneumonia, left ventricular systolic dysfunction and palmar-plantar syndrome. On D20, neutrophils were 1.5 x109/l and filgrastim was stopped. At time of writing, 10 days after the completion of UT, all toxicities had resolved except grade 3 anaemia and thrombocytopenia and grade 1 palmar-plantar syndrome, and patient is discharged home. This case highlights the difficulty in timely access of this lifesaving medication for Australian patients. Following this case, the Peter MacCallum Cancer Centre, which is the sole Australian distributor for the methotrexate antidote, glucarpidase is in discussion with Wellstat therapeutics about being the main distributor of this antidote for Australia.
Clinical factors influencing use of Abiraterone and Enzalutamide (A/E) in hormone resistant prostate cancer: real world experience

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Aim: Clinical trials have demonstrated the efficacy of Abiraterone and Enzalutamide (AE) in both chemotherapy naive (COUAA-302 and PREVAIL) and chemotherapy refractory (COU-AA301 and AFFIRM) hormone resistant prostate cancer (HRPC). We examined the factors influencing their use in relation to chemotherapy in a real world setting.

Methods: We retrospectively examined the treatment data of patients on A/E from the Mosaic cancer database from Jan 2014 to Aug 2016.

Results: Twenty four patients met the search criteria; median age 79 years (range 57-88). All patients had prostate adenocarcinoma. 12 patients had Gleason score of 9 (range 6-10). Bone metastases were present in 14/24 patients (58%); 9/24 patients (38%) had both bone and visceral metastases. Most patients were ECOG 2 (62.5%) before A/E. The median Charlson comorbidity score was 10 (range 7-13). Twelve patients (50%) were treated with A/E after Docetaxel; one patient developed seizures related to E and was changed to A. One patient (4%) received E before chemotherapy, another A followed by E due to intolerance, before chemotherapy. Eight patients (35%) did not receive any chemotherapy, only A/E. Reasons for A/E after Docetaxel were rapid PSA rise and radiological progression. In chemotherapy naive patients, treatment factors for A/E were patients’ anticipated risk of intolerance to Docetaxel, poor performance status, patient preference for A/E or rapid progression. The median duration of A/E use was 8 months and 4.5 months for chemotherapy naïve and chemotherapy resistant HRPC respectively.

Conclusions: Patients were elderly with low performance status and high risk comorbidities. Clinicians have a strong role in deciding the optimal use of A/E in this population.

Clinicopathological correlates of colorectal cancer (CRC) in young patients: An Australian Institution Experience

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Background
CRC in young patients is uncommon and a phenotypically more aggressive disease. We completed a retrospective descriptive study to determine epidemiological and pathological characteristics of young patients seen by medical oncology within the Sydney West Cancer Network between 2006 and 2015.

Methods
Patients less than 30 years of age with histologically proven CRC were included. Demographic and pathological factors were identified. Extended RAS and BRAF mutation testing was performed for all available tumours.

Results
Thirty patients were included in this study with median age of diagnosis at 26 years (range 15-29). The majority of primary tumours were left sided (63%) with rectum and splenic flexure being the most common sites (30% and 33% respectively). Twenty-four patients (80%) presented with stage 3 and 4 disease and the most common tumour histopathology was adenocarcinoma no special type (26%). Nine patients had MMR staining patterns suggestive of microsatellite instability and 8 of these underwent further genetic testing. Of those tested, 4 were positive for a genetic predisposing condition (3 with Lynch syndrome and 1 with sessile serrated polyposis syndrome). There were no familial adenomatous polyposis cases
Angiocentric glioma transformed into anaplastic ependymoma. Evidence of a pleomorphic tumour capable of ependymal and glial transformation?

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Angiocentric glioma (AG) is a low grade glioma, that was first described in 2002. Since this description, 83 cases of AG have been described, including ours. AG typically presents in childhood with medically refractory seizures that are cured with gross surgical resection. Whi...
A systematic review and Delphi survey of assessment strategies for chemotherapy-induced peripheral neuropathy

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Aims: Chemotherapy-induced peripheral neuropathy (CIPN) is a prominent side effect of the treatment of cancer. Current methods of CIPN assessment are inadequate yet no comprehensive review of CIPN assessments presently exists. Accordingly, the aim of this study was to provide a definitive survey and quality appraisal of CIPN assessment strategies.

Method: Relevant studies were identified through a search strategy developed in consultation with a UNSW medical librarian including Medline, Embase, CINAHL, and Cochrane. Inclusion criteria were English language studies of human subjects involving the assessment of CIPN in any capacity (i.e. as a study focus or as part of adverse event reporting). All assessment strategies from included articles were initially rated by an oncologist and neurophysiologist according to criteria related to assessment depth, comprehensiveness, appropriateness, and reliability. The six highest scoring assessment strategies were the focus of a Delphi survey of 32 clinicians, nurses, and consumers in which assessments were rated on a 5-point scale according to similar criteria.

Results: Database searches yielded 8720 articles after duplicate removal; 4332 articles entered full text review, and 154 distinct CIPN assessments pulled from 2404 articles were included in the qualitative synthesis. The GOG toxicity criteria, Patient Neurotoxicity Questionnaire (PNQ), FACT/GOG-Ntx, Total Neuropathy Score-reduced (TNSr), Total Neuropathy Score-clinical (TNSc), and CIPN Assessment Tool (CIPNAT) were included in the Delphi survey. The PNQ was the highest rated overall and patient-based assessment (4.2/5), while the TNSc was the highest rated clinical assessment (3.6/5). The PNQ was highly rated for requiring appropriate effort and cost, while the TNSc was highly rated for comprehensiveness, as well as appropriate effort and language for the clinical setting. No assessment was consistently rated highly across all assessment criteria.

Conclusions: The current best CIPN assessment strategies are identified, but limitations remain in their comprehensiveness, depth and likelihood of widespread adoption in clinical practice.

Clinician and nurse reporting habits for chemotherapy-induced peripheral neuropathy

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Aims: Multiple tools and strategies for assessing chemotherapy-induced peripheral neuropathy (CIPN) have been developed, yet there remains a knowledge gap regarding the usage of CIPN assessment strategies in the clinical setting. The aim of this investigation was to determine the frequency and detail of CIPN reporting in a hospital setting.

Methods: Retrospective assessment of patient notes was undertaken in 29 patients who received taxane or platinum-based chemotherapy. Oncology flow sheets, clinical notes, and clinician letters were scanned for notes regarding neuropathic symptoms. The detail, neuropathy grade (if available), and author of these notes were noted during each cycle of active treatment and at follow-up.

Results: The majority of patients (23 of 29; 79.3%) presented with neuropathic symptoms during treatment. The maximal reported neuropathy grade was grade 1 in 18 of 23 patients (78.3%), grade 2 in 3 of 23 patients (13.0%) with no grade reported in 2 of 23 patients (8.7%). 24.1% (9 of 29) patients experienced a dose reduction or cessation due to severity of neuropathic symptoms; neuropathy grade was not correlated with dose reduction or cessation (p=0.14). Neuropathy status was reported in patient notes for 199 of 369 (53.9%) analysed cycles of chemotherapy; neuropathy status was recorded during follow up for 14 of 29 patients (48.2%). However there was much variation in neuropathy reporting across chemotherapy cycles, with the frequency of reporting in patient notes varying from between 0% to 92% of chemotherapy cycles for individual patients. Neuropathy notes were most commonly found in the clinical notes (33.9%), although neuropathy status was also reported in antineoplastic drug patient assessment tools (22.5%), and oncology flow sheets (16.1%). Notes regarding patient neuropathy were most commonly written by oncologists (24.0%) and nurses (15.6%); authors of 41.1% of neuropathy notes were unclearly specified.

Conclusions: Despite a majority of patients presenting with CIPN during treatment with platinum and taxane-based chemotherapy, CIPN assessment and reporting remains inconsistent in both detail and frequency.
Exploring the feasibility of a web-based cognitive rehabilitation intervention for adult cancer survivors: A pilot study

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Aims: This study aimed to investigate the feasibility of an online cognitive rehabilitation intervention for cancer survivors. Face-to-face interventions of this sort have been effective in improving subjective and objective cognitive performance in various areas of cognitive function. There is little evidence to date about whether web-based interventions provide similar outcomes for improving cognitive function in this clinical group.

Methods: A pilot study was conducted that included a total of 50 participants divided into three groups: cancer intervention, control intervention, and control waitlist group. All cancer participants were assigned to the intervention group and control participants were randomly allocated to the intervention or waitlist group. The intervention groups completed a 4-week online cognitive rehabilitation program that was adapted from a face-to-face intervention that showed benefits in two prior published studies. Assessments were conducted at baseline, post-intervention, and 3-month follow-up. Participants rated treatment satisfaction, extent of cognitive change, likelihood of recommending the program to others, and provided an overall rating of the program. Additional assessment included measures of objective and subjective cognitive functioning, prospective memory, quality of life, distress, basic needs, and illness perception.

Results: 79% of participants were either “very satisfied” or “satisfied” with their treatment, 86% reported their cognitive problems either “improved a little” or “improved a lot”, and 83% of participants were either “likely” or “very likely” to recommend the program to others. The overall rating of the program was 7.8 on a 1 through 10 scale. Retention rates were 92% for the cancer group, 62% for the control treatment group, and 94% for the control waitlist group. Preliminary results on primary and secondary outcome measures are currently being analysed.

Conclusions: The online cognitive rehabilitation program appears to be a feasible method of providing support to cancer survivors with cognitive problems after treatment. Further investigation is warranted.

Impact of Adjuvant Treatment on Long-Term Quality of Life in Testicular Cancer Survivors

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Introduction: Issues of survivorship of testicular cancer are emerging due to excellent results from treatment. Treatment consists of orchidectomy followed by active surveillance or adjuvant therapy with chemotherapy, radiotherapy or retroperitoneal lymph node dissection. The 10-year overall survival rate for testicular cancer is 95%. We examined the effects of adjuvant therapy on quality of life in testicular cancer survivors.

Methods: 144 patients were identified to have received treatment for testicular cancer at St Vincent’s Hospital from 2001-2016. Patients were contacted by phone and mail. A validated cancer questionnaire (EORTC QLQ-C30) with testicular cancer module (EORTC QLQ-TC26) was used. Questionnaire answers were recorded on a Likert scale and converted to a score from 0-100. Independent t-tests compared domain scores between different treatments, educational levels, cancer stage and age groups.

Results: The response rate was 40% (57/144). Nine patients were deceased, and the median follow-up after orchidectomy was 42 months. Patients who received adjuvant therapy reported more financial difficulties than those who received surveillance alone (28.89 vs 5.57; P < 0.05). However, there was no difference in overall quality of life between different treatments. Those who were tertiary educated were more comfortable communicating about their disease and sexuality than those who only completed high school (99.24 vs 85.24; P < 0.01). Men who were older at the time of diagnosis reported a more positive outlook about the future (73.81 vs 57.47; P < 0.05) and fewer concerns about infertility than those diagnosed at younger ages (15.48 vs 50.57; P < 0.01). Finally, men with stage 2 disease or above reported lower social functioning than those with stage 1 disease (76.69 vs 85.21; P < 0.02).

Conclusion: Clinicians could tailor counselling according to age, educational level, disease stage and financial status at diagnosis, and reassure patients that the treatment chosen will not have a significant impact on long-term quality of life.

The prevalence and clinical implications of complementary and alternative medicine use in oncology patients

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Aims: Complementary and alternative medicine (CAM) use is known to be on the rise in cancer patients, and some CAMs are known to interact with conventional cancer treatments. The aim of this study was to provide current estimates of CAM use in cancer patients at an Australian tertiary centre, and to identify the proportion of patients at risk of CAM-drug interactions. The study was also designed to provide information on clinician-patient communication regarding CAM use.

Methods: 204 adult cancer patients recruited from the Department of Oncology at St Vincent’s Hospital, Melbourne, completed a 37-item questionnaire. Questions covered topics such as patient demographics, CAM use details, CAM information sources and clinician-patient
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**An update of the tolerability and feasibility of newer adjuvant chemotherapy in older patients with breast cancer.**

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**Background:**

Breast cancer occurs in 25% over the age of 70 years. This subgroup is not well represented in adjuvant trials. Retrospective analysis has suggested that patients tolerate older adjuvant chemotherapy well but this has not been assessed in newer chemotherapy regimens. The aim of this study was to evaluate the tolerability and feasibility of newer adjuvant chemotherapy in breast cancer patients aged 65 years and older.

**Methods:**

We conducted a retrospective study for patients aged 65 years and older who underwent adjuvant chemotherapy at Gold Coast University Hospital from 2009 to 2014. The primary outcome was maintaining a Relative Dose Intensity (RDI) over 85% calculated via the Hyrniuk method. Secondary outcomes included toxicity to chemotherapy.

**Results:**

A total of 103 patients were included in our study. Chemotherapy regimens included TC (25%), FEC-D (25%) AC-T (27%) and TCH(14%). All cycles of chemotherapy was completed in 64% of patients and 56% completed chemotherapy with an RDI greater than 85%. Admissions to hospital were recorded for 46%, and dose delays secondary to toxicity occurred in 26%. G-CSF was administered in 73% of all patients. The most common cause of discontinuation of chemotherapy was neuropathy (28%) and infective complications (19%). A statistically higher RDI was seen in patients younger than 70 years in comparison to older (Mean RDI 83 v 72, p=0.023), in the absence of hospital admission (Mean RDI 87 v 72, p=0.001) and the use of G-CSF (Mean RDI 84 v 68, p=0.002)

**Conclusion:**

It is possible to complete chemotherapy and maintain dose intensity of over 85% in older patients. However, tolerability remains sub-optimal, as reflected by chemotherapy discontinuation and dose reduction secondary to toxicity. Comprehensive geriatric assessment may help select appropriate patients for adjuvant chemotherapy, while better supportive cares such as primary G-CSF may enable higher RDI while maintaining safety.

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**Phase I trial of a nanocell packaged microRNA therapy in malignant pleural mesothelioma (MPM)**

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\(^6\) MPM is in desperate need of new therapies.

MesomirR 1 is the first-in-man phase I study testing the intravenous administration of TargomiRs. TargomiRs are nanocells (EDV\(^TM\)) targeted with EGFR antibodies and packaged with miR-15/16-derived microRNA mimics. We report findings in patients with refractory MPM.

**Methods:** 3-6 patient dose escalation cohort design with weekly/twice weekly TargomiR infusions for 8 weeks. The 1st dose level was set at 50% of the previous maximal tolerated dose for EDVs (= 5 billion TargomiRs packaged with 1.5 ug miR-15/16 mimics). CT (for modified RECIST), FDG-PET and pulmonary function assessments were scheduled weekly.
Two-year overall survival (OS) rates from a randomized phase 2 trial evaluating the combination of nivolumab (NIVO) and ipilimumab (IPI) versus IPI in patients with advanced melanoma (MEL)

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Aims: NIVO and IPI combination therapy showed a significant improvement in objective response rate and progression-free survival (PFS) vs IPI alone in phase 2 and 3 studies in MEL patients. We report the first OS results evaluating NIVO+IPI in a randomized, controlled trial.

Methods: In this phase 2 trial (CheckMate 069), 142 patients were randomly assigned 2:1 (stratified by BRAF mutation status) to receive NIVO 1 mg/kg + IPI 3 mg/kg or IPI 3 mg/kg + placebo Q3W x 4, followed by NIVO 3 mg/kg or placebo, respectively. Q2W until progression or unacceptable toxicity. Primary endpoint was objective response rate among patients with BRAF wild-type MEL. Secondary endpoints included PFS in patients with BRAF wild-type tumors and safety. OS was an exploratory endpoint. Minimum follow-up was 2 years (database lock: February 2016).

Results: We randomized 95 patients to NIVO+IPI and 47 to IPI (72 and 37 patients with BRAF V600 wild-type tumors, respectively). OS rate in patients with BRAF wild-type tumors was 69% for NIVO+IPI vs 53% for IPI alone; median OS had not been reached in the NIVO+IPI group and was 24.8 months for the IPI group (hazard ratio 0.58, 95% CI 0.31-1.08). Two-year PFS rates were 54% for NIVO+IPI vs 11% for IPI alone; median PFS had not been reached in the NIVO+IPI group and was 4.4 months for the IPI group (hazard ratio 0.35, 95% CI 0.21-0.59, p<0.0001). Grade 3-4 treatment-related adverse events (AEs) were reported more frequently in NIVO+IPI patients (54%) vs IPI alone (20%) and led to discontinuation in 30% vs 9%, respectively.

Conclusions: The combination of first-line NIVO+IPI led to a numerically higher 2-year OS rate than first-line IPI alone in patients with MEL. There were no new safety signals with longer follow-up.
Screening for Circulating Tumour Cells (CTC) allows early detection of cancer – a cohort study

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Background
Migration of Circulating Tumour Cells (CTC) into the bloodstream may be associated with early carcinogenesis, and can provide a biomarker for cancer progression and treatment effectiveness. Kruau et al. demonstrated an increase in CTCs in patients with advanced disease, whilst a decrease in CTCs is associated with cancer containment or remission. Several technologies have been developed to identify CTC, including the isolation-by-Size-of-Epithelial-Tumour (ISET) technology (Rarecells, France), combining blood filtration and analysis by microscopy using standard histo-pathological criteria. The ISET-CTC method has been validated in several studies and provides very high specificity and sensitivity.

Aims and methods
Using the ISET-CTC method the study aimed to compare CTC count to cancer status and cancer risk, by monitoring treatment effectiveness in cancer patients and by screening for CTC in patients with a family history of cancer or clinical indication but no tumour mass.

Results
Between Sep-2014 and Apr-2016 we undertook >360 CTC tests, 180 (50%) were screening requests. CTC were detected in 90 (50%) of those patients screened and follow-up tests including scans were scheduled within 1-6 months of CTC results. In up to 50% of male patients with normal PSA (prostate specific antigen) levels but with CTC, PET scans using PSMA (Ga-68 prostate-specific membrane antigens) revealed increased uptake in the prostate, which is indicative of early prostate cancer. Early breast cancer was detected in a small number of asymptomatic women with positive CTC tests. All patients with detected CTC received advice on adjuvant immune-stimulating nutritional therapy. Repeat CTC testing at 3-6 months available for 18 patients after adjuvant nutritional therapy revealed reduced CTC count.

Conclusions
CTC screening provides a highly sensitive tool for the early detection of patients at risk of developing cancer. Evidence-based adjuvant nutritional therapy can reduce CTC count and cancer risk.

Is there a correlation between AMH and menses resumption after breast cancer treatment?

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Aims
Breast cancer is common among pre-menopausal women and its treatment may cause secondary amenorrhea, often defined as at least 6 months without menses. Timing of menses resumption is important for planning post-chemotherapy fertility preservation or pregnancy, given the shortened reproductive window. We sought to identify association of factors, such as age, Anti-mullerian hormone (AMH) and adjuvant therapy, with return of menses.

Methods
Patients with chemotherapy treated breast cancer were identified through a database and their medical histories were reviewed to determine: estrogen receptor (ER) status (used as surrogate marker of adjuvant therapy), AMH, menstrual patterns at follow-up. Patients seen after 2012, corresponding with introduction of AMH Gen II assay, were included for standardisation. Logistic and multiple regression statistical tests were used to analyse data.

Results
Ninety-seven women who met the selection criteria women were identified. After review, 51 were excluded and 46 women included. Reasons for exclusion included: incomplete follow-up (18), no chemotherapy (10), unable to verify records (16), ongoing chemotherapy (5), and currently on Zoladex (2). 40/46 (87%) were considered amenorrheic (>6/12 absent menses) and lost their period for a median of 9 months, with 33/46 (72%) resuming menses within 2 years. While 80% of these women resumed menses within 1 year, 20% resumed after that time. For patients who resumed at 6 and 12 months, compared to those who did not, there was no significant difference between AMH levels (p=0.096), age (p=0.18) or ER status (p=0.18). Similarly, AMH was not a significant predictor of time to menses resumption (p=0.35).

Conclusions
Treatment-induced amenorrhea was temporary for most women. Contrary to our initial hypothesis, there was no correlation between AMH, age, ER status and menses resumption. This may be due to the small sample size, but is biologically plausible and prospective studies are required to confirm this finding, in addition to correlating temporary amenorrhea with later primary ovarian insufficiency. This adds to understanding chemotherapy-related menstrual dysfunction and useful for counselling.

“Big Bang”: Going live on implementation of the Digital Hospital Program in Cancer Services at Princess Alexandra Hospital

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Title: “Big Bang”: Going live on implementation of the Digital Hospital Program in Cancer Services at Princess Alexandra Hospital
Introduction
The Digital Hospital Program (DHP) at Princess Alexandra Hospital (PAH) is Australia’s first large-scale DHP focussed on the transformation of traditional paper formats to an integrated electronic medical record (ieMR). It represents a significant change in workflow.

Objectives/Aims
The aim of this presentation is to describe the procedures that enabled and impeded successful implementation of the DHP during the fortnight-long go-live period in the Division of Cancer Services, PAH.

Description/Methodology
Governance procedures were developed by the Training Advisory Committee and the Digital Implementation Group, comprising multidisciplinary stakeholders. These underpinned all implementation processes, such as clinician-tailored training programs using strategies such as concept socialisation, cancer service-specific dress rehearsals and clinical scenarios. Training was supported by a nurse-led, multidisciplinary team of change champions, clinical informatics specialists, ‘super-users’, and consumers. Implementation was enhanced by digital-driven changes in the model of care, e.g. approaches to therapeutic communication with patients and modification of staff roles. Constant support was provided by digital ‘floorwalkers’ on all shifts. A ‘dashboard’ system measuring staff training attendance and proficiency monitored progress daily.

Outcomes
The DHP was implemented on time, on budget and with all cancer services staff deemed competent on go-live day. No patient complaints or incidents were reported during implementation or to date. The Best Practice Australia Survey concurrently administered indicated staff satisfaction continued to benchmark above average during the implementation period.

Conclusion
Creating a network of frontline cancer staff, supported by good governance, has delivered a transformational change resulting in successful implementation of the DHP.

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Outcome of patients with synchronous and metachronous primary lung cancer after diagnosis of head and neck cancer

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Background: It is not infrequent that patients with HNC are also diagnosed with primary non-small cell lung cancer (NSCLC). The presence of a synchronous (SLC) or metachronous lung cancer (MLC) greatly complicates the treatment decisions and overall prognosis. We describe the local experience of HNC with SLC and MLC.

Methods: Patients were identified from a database of confirmed HNC patients known to have a first secondary NSCLC.

Results: 34 eligible HNC patients were identified. 15 patients had SLC and 19 patients had MLC. The median follow-up of all patients was 39 months (4 – 275). Only 2/15 patients were symptomatic from SLC and all were incidentally diagnosed on staging of HNC. 13/15 patients received curative intent treatment for HNC followed by treatment for lung cancer. 6/15 patients in SLC group were in complete remission, 5 patients had died (3 due to NSCLC; 2 HNC) and 4 patients were alive with progressive disease (3 NSCLC, 1 HNC). 19 patients had MLC with a median of 47 months (11-259) between a diagnosis of HNC and diagnosis of MLC. 42% of patients were symptomatic from MLC at diagnosis. At the time of follow-up, 12 patients had died, 3 patients were alive with disease and 4 patients had been lost to follow up. Lung cancer was the main reason for death or progressive disease in the majority of patients. Median survival from the time of lung cancer diagnosis was 13 months in the overall population, with a trend to better survival with SLC (15 vs 11 months for MLC, p=0.11).

Conclusion: Second primary lung malignancies in HNC should be discussed and managed in tertiary hospitals with a multidisciplinary approach on an individualized basis. Aggressive management can still result in respectable long term disease control rates particularly in SLC patients.

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Feasibility of a research protocol for studying patterns of investigation and treatment for bone complications in patients treated with aromatase inhibitors for early breast cancer

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Background: Aromatase inhibitors (AIs) are standard adjuvant therapy for post menopausal women with hormone receptor positive breast cancer [1]. AIs increase the risk of osteoporosis and fracture, with an estimated 9% fracture rate after 5 years of therapy. [2] This causes morbidity and mortality in patients with an otherwise excellent prognosis. There is no standard or guideline for bone health monitoring of patients on AIs. The prevalence of investigation and treatment is unknown. We aim to review the patterns of investigation and treatment of osteoporosis in breast cancer patients on AIs at our centre.

Methods: We identified postmenopausal women receiving AIs for early hormone receptor positive breast cancer in our area health service in 2009. We used this to estimate the number of patients seen between 2009 to 2011 inclusive for the final cross-sectional study. Bone mineral density (BMD) and Vitamin D assessment will be retrieved through Computerised Provider Order Entry or the oncology electronic medical record. A multivariate logistic regression analysis using 14 co-variates is planned in the final analysis, including age at diagnosis, BMI, BMDs throughout therapy, and commencement of bisphosphonate therapy.
Results: We identified 172 consecutive early breast cancer cases and 48 patients (28%) were eligible for inclusion. The main reasons for exclusion were treatment with tamoxifen (N=43, 25%) or did not receive any endocrine therapy for any reason (N=62, 36%). We anticipate that 22 of the 880 cases would have developed insufficient fractures for our study period, with a larger number developing osteoporosis.

Conclusion: Our preliminary analysis suggests sufficient numbers of events to conduct a retrospective study at our centre. We anticipate our study to inform patterns of assessment and risk factors for osteoporosis in our population and could be developed into a tool to ensure relevant bone health investigations occur in appropriate patients.

This study was approved by SWSLHD HREC reference AU/6/5A45212.


Evaluation of a weight management program for overweight and obese cancer survivors.

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Background
Obesity, body fat and lack of physical activity and cancer incidence are linked. For cancer survivors, these factors contribute to poorer disease and health-related outcomes. We aimed to determine the feasibility of implementing a weight management program for overweight/obese cancer survivors in an outpatient setting.

Method
Overweight/obese (BMI ≥25kg/m²) adults who had completed treatment for localised cancer and ENRICH (6-week lifestyle program), were eligible. Intervention: i) clinic consultations (3); ii) supervised exercise sessions (2x/week); and, iii) dietary sessions (12) over 6 months. Assessments: baseline, 3 (mid-intervention), 6 (post-intervention) months. Primary outcome was adherence. Secondary outcomes: body composition, physical activity, nutritional quality, patient reported outcomes (PROs), biomarkers, and qualitative interview.

Results
Twelve women were recruited, median age 66 (45-71) years. Tumour groups: breast 67%, colorectal 25%, and Non-Hodgkin’s Lymphoma (8%). At baseline, 3 participants were overweight (BMI ≥ 25-29.9kg/m2), 9 obese (≥30kg/m²); 9 had 1+ comorbidity. Participants attended 97% of clinics, 71% of exercise and 81% of dietary sessions. Post-intervention, mean weight loss was 4.9kg (range +0.1 to -19.6kg) and 5% reduction of initial body weight. Waist circumference reduced by 3.8cm (+13.2 - 4.8cm), total body fat mass 3%, and lean body mass 2% increase. Improvements in aerobic fitness (mean +6ml/kg/min) and maximal leg strength (mean +33kg) were seen. Post-intervention, participants had reduced daily nutritional intake by 270kcal; 25% met daily fruit and vegetable recommendations. No changes were seen in PROs or biomarkers (fasting glucose, IGF-1, cholesterol, C-reactive protein). Participant’s identified support from program staff and other participants, and program tailored to their needs as facilitators of adherence.

Conclusion
This study confirms that overweight and obese cancer survivors are willing to attend an intensive weight management program. The program enabled positive changes to weight, body composition, fitness and nutritional quality. Longer follow up will provide data on sustained changes.

Safety Profile of Nivolumab Administered as 30-minute Infusion: Analysis of Data from CheckMate 153

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Aim: Nivolumab, anti-programmed death-1 (PD-1) antibody, is approved in the US for previously treated metastatic NSCLC and renal cell carcinoma, and for advanced melanoma, and in the EU for previously treated squamous NSCLC and advanced melanoma. The impact of infusion time on nivolumab safety was assessed in an ongoing, predominantly community-based trial (CheckMate 153; NCT02066636).

Methods: Patients with advanced/metastatic NSCLC who progressed during or after ≥1 prior therapy were enrolled. The primary study outcome was incidence of grade 3–4 and 5 and select treatment-related adverse events (TRAEs). Patients received nivolumab 3 mg/kg IV Q2W; infusion time was shortened from 60 to 30 minutes following a study protocol amendment.

Results: A total of 322 and 355 patients, respectively, received nivolumab by 30-minute or 60-minute infusion; demographics for these patients are comparable to the overall population (median follow-up, 6 mo). Any grade (grade 3–4) TRAEs occurred in 53% (11%) and 51% (12%) of patients with 30-minute or 60-minute infusions, respectively. Grade 3–4 select AEs of any cause in ≥2% of patients given 30-minute or 60-minute infusions occurred in pulmonary (3% and 2%), hepatic (2% and 3%), and gastrointestinal (2% and 2%) categories. Any grade (grade 3–4) hypersensitivity/infusion reaction of any cause occurred in 2% and 1% (<1% and <1%) of patients given 30-minute or 60-minute infusions, respectively; these led to nivolumab discontinuation in <1% and 1% (<1% and 1%) of patients, respectively. Systemic corticosteroids for hypersensitivity/infusion reactions were administered to 3 patients and 1 patient given the 30-minute and 60-minute infusions, respectively. The predicted nivolumab maximum plasma concentration after the first dose and at steady state was similar with 30-minute and 60-minute infusions.

Conclusions: Nivolumab 3 mg/kg can be safely infused over 30 minutes, with a safety profile comparable to 60-minute infusion and a low incidence of infusion-related reactions.

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More than a decade of giving neoadjuvant chemotherapy in an Australian breast cancer setting: what have we learned?

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BACKGROUND: Neoadjuvant chemotherapy has been shown to result in similar survival outcomes to adjuvant chemotherapy in breast cancer patients with non-metastatic breast cancer1. The known benefits of neoadjuvant therapies are predominantly to downstage or facilitate surgery and to provide information on the biological response of the tumour to treatment. Response to neoadjuvant therapy, such as attaining a pathological complete response, has been shown to improve survival outcomes. However, more recently there are newer arguments emerging to support the use of neoadjuvant therapy such as the ability to facilitate early reconstruction.

AIMS: The aim of this retrospective study was to evaluate patient selection, clinicopathological characteristics, surgical outcomes and survival over the past decade of treating patients with neoadjuvant chemotherapy at both The Austin and Northern Hospitals.

METHODS: Neoadjuvant patients were identified from histopathology databases between 2004 and 2016 and were eligible for this analysis if they were non-metastatic at the time of commencing treatment. Clinicopathological characteristics, treatment intent, survival and surgical outcomes were recorded.

RESULTS: Eight-five patients with a median age of 50 years at diagnosis. Nearly half (45%) of the breast cancers were T3 or T4 tumour size at baseline. Sixty-four percent of patients had oestrogen-receptor (ER) positive disease, 32% had HER2 positive disease and 17% had triple negative disease. Approximately 10% of treated patients were deemed inoperable at diagnosis. The vast majority (82%) of all patients underwent mastectomy. Ninety percent of patients received third-generation chemotherapy regimens and nearly all HER2 positive patients received adjuvant trastuzumab. The pathological complete response (pCR) rate was approximately 20%. Further results detailing surgical down-staging and uptake of immediate reconstructive surgery will be presented. One in four patients had a relapse event and 21% of patients had died with breast cancer recurrence.

CONCLUSION: This series describes our experience of using neoadjuvant chemotherapy in high-risk, non-metastatic patients. In this constantly evolving field particularly with the introduction of neoadjuvant targeted therapy in HER2-positive patients, there are emerging indications to consider neoadjuvant treatment that require further exploration.

Outcomes by Site of Metastasis for Patients With Radioiodine-refractory Differentiated Thyroid Cancer Treated With Lenvatinib Versus Placebo: Results from a Phase 3, Randomized Trial

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Aim
In the phase 3 study of patients with radioiodine-refractory differentiated thyroid cancer (RR-DTC), lenvatinib prolonged median progression-free survival (PFS) versus placebo (18.3 vs 3.6 months; HR: 0.21; 99% CI 0.14–0.31; P<0.001). This subanalysis examines efficacy by baseline metastasis site.

**Methods**

Patients with progressive RR-DTC were randomized 2:1 to lenvatinib 24 mg/day or placebo. Tumor assessments performed at baseline and every 8 weeks were independently evaluated using RECIST version 1.1.

**Results**

Of 392 patients, 388 (99.0%) had ≥1 metastatic site (1, n=96; 2, n=134; 3, n=107, ≥4, n=51); 34% and 66% had follicular and papillary histologies, respectively. Median PFS for patients with 1, 2, 3, and ≥4 sites was not reached; 18.3, 16.5, and 11.0 months, respectively, for lenvatinib; and 3.7, 3.7, 3.6, and 2.0 months, respectively, for placebo. Overall response rates were: brain 66.7% (69/104), bone 51.0% (53/104), liver 51.2% (22/43), lung 66.1% (154/236), and lymph node 65.2% (90/138); patients could have ≥1 metastatic site. There were 16 patients with brain (PFS for lenvatinib vs placebo: 8.8 vs 3.7 months; HR: 1.00), 376 without brain (18.7 vs 3.6; HR: 0.21), 152 with bone (14.8 vs 2.1; HR: 0.28); 240 without bone (20.2 vs 3.7; HR: 0.18), 71 with liver (7.6 vs 3.7; HR: 0.51), 321 without liver (18.7 vs 3.6; HR: 0.21), 42 without lung (14.8 vs 3.6; HR: 0.24), 202 with lymph node (14.8 vs 3.6; HR: 0.24) and 190 without lymph node metastasis (not estimable vs 3.6; HR: 0.24).

Differences between subgroups for lenvatinib were less evident for placebo.

**Conclusion**

For these metastasis sites, response rates were >50% and PFS benefit with lenvatinib was preserved in all but the brain subgroup. These findings suggest greater lenvatinib treatment benefit in patients with better prognosis, as defined by metastatic site.

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**Phase 2 Study of Lenvatinib in Patients With Differentiated, Medullary, and Anaplastic Thyroid Cancer: Final Analysis Results**

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**Aim**

Thyroid cancer is classified into differentiated (DTC), medullary (MTC), and anaplastic (ATC) types. Lenvatinib prolonged progression-free survival (PFS) versus placebo in the phase 3 SELECT trial for 131I-refractory DTC (RR-DTC). Initial results of this phase 2 trial in RR-DTC, MTC, and ATC were previously reported; final results are reported here.

**Methods**

This single-arm, open-label study was conducted in Japan (updated data cutoff: 9 July 2015). Patients received lenvatinib (24 mg/d, 28-d cycles) until progressive disease or development of unacceptable toxicity. Primary endpoint was safety; secondary endpoints included PFS, overall survival (OS), overall response rate (ORR), and disease control rate (DCR).

**Results**

Fifty-one patients (25 with RR-DTC [previously 23], 9 with MTC, and 17 with ATC [previously 11]) enrolled. All had ≥1 treatment-emergent adverse event (TEAE). Common TEAEs included hypertension (90%), decreased appetite (78%), palmar-plantar erythrodysesthesia syndrome (77%), fatigue (73%), proteinuria (61%), stomatitis (57%), and diarrhea (55%). Incidences of grade 3/4 TEAEs were similar among subgroups (RR-DTC, 72%; MTC, 100%; ATC, 88%). Only 1 patient discontinued due to a TEAE. There were 4 fatal AEs (none treatment-related). Most patients showed tumor shrinkage. Median duration of treatment was 5.5 months (range, 0.7–33.1) for patients with ATC; 8 received lenvatinib for >6 months. Median PFS (95% CI) was 25.8 (18.4–not evaluable [NE]), 9.2 (1.8–NE) and 7.4 (1.7–12.9) months for RR-DTC, MTC, and ATC, respectively. Median OS (95% CI) was 31.8 (31.8–NE), 12.1 (3.8–NE), and 10.6 (3.8–19.8) months for RR-DTC, MTC, and ATC, respectively. ORR was 68% for RR-DTC, 22% for MTC and 24% for ATC (all partial responses). DCR was 100% for RR-DTC and MTC and 71% for ATC.

**Conclusions**

Lenvatinib showed tumor shrinkage in most patients, including those with ATC. Toxicities were manageable with dose modifications. Lenvatinib efficacy, especially in ATC, warrants further investigation.

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**Responses in Specific Metastases Following Treatment With Lenvatinib: Results From the Phase 3 SELECT Trial**

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Introduction
The BOLERO-2 trial demonstrated significant clinical benefit and a tolerable toxicity profile of combination therapy with everolimus and exemestane in post-menopausal females with hormone receptor positive metastatic breast cancer, after prior progression on hormone therapy. We present the local experience using this combination with respect to efficacy as well as the incidence and severity of side effects at a single Australian cancer centre.

Materials and Methods
We retrospectively reviewed data from 21 patients who received everolimus in combination with exemestane. Efficacy was assessed by patient’s response on imaging and measurement of tumour markers Ca15.3 and carcinoembryonic antigen (CEA). Safety assessments were according to the National Cancer Institute Common Terminology Criteria for Adverse Events, version 3.0. Treatment interruptions and dose modifications were collected from patient records.

Results
The median PFS/Time to treatment change in our cohort was 4.6 months (range 1 – 14 months), slightly shorter than the median PFS of 6.9 months (HR 0.43; 95% CI 0.35-0.54) reported in the BOLERO-2 study, likely secondary to a smaller population and more elderly patients in our cohort.

The median duration of therapy was 5 months (range 3 -14 months). Overall the clinical benefit rate was 81% (n=17), with a response rate of 47% (n=10).

The administration of everolimus with exemestane was mostly well tolerated. Most of the everolimus-associated adverse events occurred soon after initiation of therapy, and were typically of mild or moderate severity. The adverse events were managed with dose reduction and treatment interruption. The median duration of therapy was 5 months (range 3 -14 months). The reason for discontinuation of therapy was distributed between toxicity (8 patients) and disease progression (13 patients).

Use of Positron Emission Tomography (PET) scan in breast cancer – a single centre study

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Background: The role of positron emission tomography (PET scan) is in breast cancer is not yet clearly defined. PET scan has been shown to have potential for utility for management of breast cancer patients in a variety of settings, particularly with reference to metastatic disease. The aim of this project is to summarise current clinical practice at a single centre regarding the use of PET-CT for breast cancer and assess its utility in patient management. Method: All PETs performed at FSH were screened to identify those requested for patients known to have breast cancer. Details of the request indication, requesting clinician, and other investigations ordered prior or following the imaging request were also recorded. The PET reports were also screened for any new findings that directly led to change of management. Results: A total of 16 scans were done during the study period, 8 were ordered by Medical Oncologist, 5 by general practitioners, and 3 by other clinicians. Three were performed for patients with localised disease to investigate for potential metastatic disease, and 12 for patients with known metastatic disease. 8 scans resulted in findings which altered patient management subsequently. These findings included a suspicious ovarian lesion, subsequently diagnosed to be ovarian cancer, and progression of disease not seen on other modalities of imaging. Of the 8 scans that showed new findings, which altered management, 5 were generated by Oncologist. Conclusion: PET is being used, but infrequently for patients with breast cancer. For 50% of the patients, the PET scan results altered subsequent patient management. This imaging modality should be considered in selected cases, with further prospective research required.

Acceptability of an innovative funding model for breast cancer research and patient support

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Background
For Benefit Medicines (FBM) is the first Australian pharmaceutical company that donates 100% of profits to medical research and patient support. All profits from the sale of two generic breast cancer drugs (anastrozole and letrozole) are being distributed through the FBM Foundation to Breast Cancer Network Australia (BCNA) and Breast Cancer Institute Australia (BCIA). BCIA supports clinical trials research for the prevention and treatment of breast cancer. BCNA provides Australians affected by breast cancer with information and support.

Aims
To determine consumer acceptability of generic breast cancer drugs where 100% of profits are donated to breast cancer organisations, and barriers to the uptake of these drugs.

Methods
In December 2015, an online survey was emailed to 2,178 women with breast cancer who had previously volunteered to participate in BCNA research projects.

Results
In total, 623 women completed the survey (24.5% response rate). The majority reported they had taken/were taking an aromatase inhibitor to treat breast cancer (n = 393, 63.3%), with the most using the brand name drug (anastrozole 73.2%; letrozole 64.2%). Only 6.3% of participants were aware that one drug company donates 100% profits to supporting Australians with breast cancer, and only 4.4% knew of FBM. A high proportion reported they would be likely/very likely to use a generic brand that donated 100% profits (79.3%). Top reasons for not choosing a generic were concerns about drug effectiveness (56.0%), adverse reactions to non-active ingredients (54.4%), and drug safety (44.0%).

Conclusions
While consumers are very positive about drugs where 100% of the profits are donated to breast cancer organisations, very few are aware that such drugs exist and many have concerns about using a generic drug. Generic drug companies need to respond to these concerns if consumers are to support this new type of funding model.

Vitamin D deficiency and Early Breast Cancer: An Australian experience

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Aim
Adequate levels of vitamin D are important for optimal bone health. Australian woman with early breast cancer are frequently vitamin D deficient and are exposed to additional risk factors for osteoporosis. To gauge the burden of vitamin D deficiency, this study was designed to assess serum 25(OH)-D levels at two time-points: at commencement and completion of adjuvant systemic chemotherapy.

Methods
Serum 25(OH)-D levels were measured in patients over 2 time periods: 2009-2011 (cohort 1) and 2012-2016 (cohort 2). Cohort 1 included 253 women and assessed 25(OH)-D levels at chemotherapy completion. Changes in serum 25(OH)-D levels were followed in a subgroup of patients (N=63, subgroup A) at three and at twelve months. Cohort 2 included 267 patients and assessed 25(OH)-D levels during chemotherapy. Baseline 25(OH)-D levels were measured within weeks of surgery, and a subgroup (N=102, subgroup B) agreed to check levels at chemotherapy completion and three months later.

Results
In cohort 1, 53% (of 253 women) were vitamin D deficient (< 50 nmol/L) after systemic chemotherapy, and in cohort 2, 44% (of 267) had deficient serum 25OH-D levels prior to chemotherapy. In the majority, the deficiency was mild.

In subgroup A, there was a considerable improvement in serum 25(OH)-D levels, from 63% deficient (...

Conclusion

Vitamin D deficiency is common in Australian women with early breast cancer. Assessment and replacement of vitamin D should become part of routine management in this population.

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Assessing patient suitability for risk-reducing mastectomy: a psychologist’s role.

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Aim: Increasingly RRM is the preferred intervention to reduce the risk of developing breast cancer amongst women who have an identified risk. Health professionals (HPs) often refer patients to psychologists for assessment prior to RRM. For psychologists to do so effectively, there is a need to more clearly define and standardise the role of the psychologist in this process. This would ensure effective psychological evaluation of patients and support to the multidisciplinary team. This qualitative study aimed to explore the current role of a psychologist in pre-surgical psychological assessment of women undergoing RRM.

Methods: Twenty-five HPs (surgeons, psychologists, genetic counselors and breast care nurses) were recruited from tertiary breast cancer institutions, specialist breast cancer centres and established group for psychologists working in oncology. Participants completed semi-structured interviews (n=15) or participated in a focus group (n=10). Data collection occurred until data saturation. Interviews were audiotaped, transcribed and qualitatively analysed using Framework analysis methods.

Results: Health professionals indicated that psychologists had a varied and dynamic role in the assessment of women undergoing RRM. Qualitative analysis revealed four themes: (1) perceived patient motivation to undergo RRM; (2) health professional reasons for psychologist referral; (3) role of the psychologist; (4) value of psychologist involvement. The proposed role of the psychologist included: assessing patient understanding of information, assessing psychological state, assisting with informed decision-making and preparing the patient for a smooth adjustment. HPs reported that psychologist involvement reassured the multidisciplinary team and provided emotional support to patients that HPs felt was valuable but beyond their time constraints and/or training.

Conclusions: Understanding the psychologists’ role will provide guidance for HPs working with women seeking RRM. The current findings will inform the development of a standardised psychological assessment protocol that can be widely used by psychologists treating this population.

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Cancer Australia Statement – influencing best practice in breast cancer

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Aims

While survival for women with breast cancer in Australia is amongst the highest in the world, there is evidence of unwarranted variations in breast cancer practice that impact on patient experiences and outcomes. Cancer Australia has developed the Cancer Australia Statement – influencing best practice in breast cancer to support effective, patient-centred cancer care and improve cancer outcomes. The Statement aims to encourage health professionals to reflect on their clinical practice to ensure that it is aligned with the evidence.

Methods

An Expert Group was established with representation from relevant clinical colleges and cancer and consumer organisations. Candidate breast cancer practices were identified from relevant national and international clinical guidelines, publications and position statements, with additional practices nominated by the Expert Group. Consensus on a final list of practices was informed by agreed selection criteria, including evidence of benefit or harm, evidence of unwarranted variation in practice in Australia, alignment with patient preferences and personal values, evidence of inconsistent use and high potential to change clinical practice.

Results

The Statement comprises 12 key appropriate and inappropriate breast cancer practices, spanning the cancer care continuum from diagnosis to end-of-life care. Each practice is supported by explanatory text detailing context, supporting evidence and value to patients, together with supporting references. All relevant clinical colleges, cancer and consumer organisations reviewed and had input into the agreed final wording of the Statement.

Conclusions

The Statement represents agreed priorities in breast cancer practice which, if implemented, will reduce unnecessary variations in care and outcomes. It is intended to complement relevant clinical practice guidelines, and highlight what ‘ought to be done’ in breast cancer care to maximise clinical benefit, minimise harm and deliver patient-centred care. The value of the Statement will be realised in informing and influencing wise decision-making between patients and their health care professionals.
A survey of Australian and New Zealand clinical use of antiresorptive therapy in metastatic breast cancer

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Methods: Antiresorptive therapy is a cornerstone in the management of patients with metastatic breast cancer with bony metastases. We aimed to evaluate current clinical antiresorptive prescribing practices of medical oncologists in Australia and New Zealand.

Results: Our response rate was 37.8% (91/241). Respondents had been working in medical oncology for a median of 15 years (range 4–40). Most (81%) prescribed an antiresorptive agent in all patients with bony metastases with 83% of respondents using denosumab as their standard treatment for newly diagnosed bone metastases. Co-prescribing of oral calcium and vitamin D was seen more with the use of denosumab than bisphosphonates. (Always: 64% vs 20%). Dental review was advised by most (69%) before commencement. Dosing frequency was similar for IV bisphosphonates and denosumab with many decreasing frequency of administration of both agents over time (93.3% and 58.7% respectively). Renal function was a more important factor in IV bisphosphonate use. 56% of clinicians did not consider a maximum duration of therapy. 24% stopped antiresorptive therapy (median 30 months, range 24–60 months). Osteonecrosis of the jaw was uncommon (one case every 2–5 years – 29.2%, less than one case per 5 years – 23.6%) as were atypical fractures. Most (97%) withheld treatment for dental extraction with some (42%) using prophylactic antibiotic cover and more (56%) recommencing when healed rather than a fixed period from extraction.

Conclusions: The varying use of antiresorptive agents seen in this survey highlights the need for further research to optimize the use of these agents in a group of patients whose life expectancy has increased considerably over the past decades.

Addressing variations in outcomes for nonmetropolitan and Indigenous women with breast cancer

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Aims
While on average Australia has high breast cancer survival compared to international benchmarks, there is evidence that nonmetropolitan and Indigenous women experience poorer outcomes. This study aimed to identify and analyse factors contributing to poorer breast cancer outcomes for these women.

Methods
Cancer Australia engaged Cancer Council Queensland to undertake an evidence review to identify and analyse factors contributing to poorer breast cancer outcomes for nonmetropolitan and Indigenous women at one or more steps along the breast cancer continuum of care. The scientific literature review included published evidence between 1990 and 2015 and was focused across four themes: survival outcomes, patient and tumour characteristics, diagnostic and treatment outcomes, and psychosocial outcomes. A national scoping activity was undertaken to identify unpublished studies, reports and epidemiological and health service data. A report was developed summarising findings and priorities for future policy, practice and research.

Results
Of the initial 114 articles identified during the systematic searches, 16 met inclusion criteria for the review. Despite evidence gaps, which reflect variability among studies and a predominance of state-specific studies, the review found evidence that factors contributing to poorer survival may include differences in screening rates, time of diagnosis, type of treatment and other health and socioeconomic factors. For Indigenous women, in addition to these factors, cultural beliefs and social determinants of health may also contribute to poorer survival.

Conclusions
A number of factors were identified which may contribute to the poorer breast cancer outcomes of nonmetropolitan and Indigenous women. Based on the evidence reviewed, priorities have been identified to improve breast cancer outcomes for non-metropolitan and Indigenous women across the continuum of care. Given the limitations in the availability of evidence, priorities include further developing the evidence base to address key gaps in knowledge and improve the quality of future research.

Women’s preferences for avoiding cancer recurrence: a focus on contralateral prophylactic mastectomy

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Aim:
To investigate women’s preferences for routine monitoring or contralateral prophylactic mastectomy (CPM) to manage breast cancer recurrence risk.

Methods:
A community based discrete choice experiment (DCE) was used with attributes and levels derived from qualitative research with women who had undergone treatment for early stage breast cancer. The DCE presented women with 12 choices that described the underlying characteristics of routine monitoring and CPM: mode and frequency of monitoring; risk of cancer recurrence; risk of pain or loss of breast sensitivity; involvement in decision making; and costs. For each question, women were asked to choose their preferred management option. Women also rated their degree of concern about each of the attributes, including cancer recurrence, when making their choices. Results were analysed using mixed logit and latent class analysis.
57.5% of women always chose one option, typically routine monitoring (49.1%), with fewer always choosing CPM (8.4%). Women fell into three groups: those preferring routine monitoring; those preferring CPM; and those who were willing to trade between the options (‘traders’). Among traders, choices were most highly influenced by the risk of cancer recurrence; women were less likely to choose an option associated with higher risk. Women were more likely to choose options associated with less intrusive methods of monitoring and where they were involved in decisions about their care. Women who were concerned about cancer recurrence were more likely to choose CPM over routine monitoring.

Conclusions:
Women have strong preferences regarding choice of management for breast cancer recurrence that reflect their concerns about the health effects of ongoing management and the associated experience of care.

Understanding the health literacy and information needs of patients newly diagnosed with breast cancer

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**Introduction:** Health literacy describes the ability to access, understand, appraise and use information to make decisions about health. We aimed to understand the health literacy and information needs of breast cancer patients at the time of diagnosis.

**Methods:** A mixed methods approach was used. 70 consecutive patients with a new diagnosis of breast cancer were asked to complete the Health Literacy Questionnaire (HLQ) and the Cassileth Information Needs Questionnaire. Semi-structured interviews were conducted concurrently until data saturation. Quantitative data was analysed using descriptive statistics and hierarchical cluster analysis. Qualitative data was thematically analysed. The results were triangulated to understand the information needs and health literacy of the population.

**Results:** 71 HLQ responses were received. 98% of respondents were female, median age 60 (range 39 to 88). 20 women participated in semi-structured interviews, median age 58 (range 39 to 79). Cluster analysis revealed four patient subgroups with distinct profiles of HLQ scores (p<0.01), independent of education and age (p>0.01). 81% of respondents wanted detailed information relating to their diagnosis and treatment. Interviewed participants wanted accurate information about prognosis and the rationale and benefits of each treatment. Specific information needs differed according to age. Treating doctors were the primary source of information and breast care nurses were valued for their ability to simplify medical information, provide practical advice and reassurance. Overall participants trusted written information but reported it often did not meet their specific needs or the volume provided made it difficult to navigate.

**Conclusions:** Patients report a strong preference for detailed information about breast cancer and its treatments. The form of this information and its provision may need to vary in response to patient preferences and health literacy. Tailored written information would be a valued adjunct to clinical consultation.

Role Ambiguity in SBN practice in Rural and Regional Queensland results in variations of service delivery.

**Pammie Ellem**, **Marion Strong**

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In a study, utilising Participatory Action Research, involving rural and regional Queensland SBN's, one clear theme emerges from the analysed data - Ambiguity surrounding the SBN role. Themes of geographical diversity and isolation, dictating service provision also emerged. This paper highlights significant impacts of SBN role ambiguity on coordinated practice and patient care.

Role ambiguity results from uncertainty and discrepancies between employer role expectations and the SBN practice guidelines. Role ambiguity is a threat to productivity in the workplace, with workers who experience role ambiguity at risk of professional burnout (Yoshie, Sato & Takahashi, 2008) and Aker (2003). The size of the Australia SBN workforce has rapidly increased in the past 10 years (Ahern, Gardner and Courtney 2016), a factor known to contribute to role ambiguity. When rapid growth occurs, services are often tended out to third party companies for administration. Hence, services are no longer governed by traditional service providers, increasing potential for role variation, leading to role ambiguity. Yoshie et al. (2008) and Aker (2003) concur that role ambiguity can lead to professional burnout and reduced productivity through emotional exhaustion. In the current study, 70% of the positions were established in the past 10 years and 40% and 60% are administered by a third party organisation.

Many authors including Black and Farmer (2013), Ahern & Gardner (2015) & Jones et al. (2010) call for further research and clarification of the SBN role in Australia. Our study highlights the urgency for the role clarification and establishment of referral pathways from metropolitan to regional centres enhancing patient flow and creating supportive networks for both patients and the SBN.

We propose Australia needs to review SBN competency statements (2005) to honestly reflect the diversity within the current SBN workforce, to deliver equitable services to breast cancer patients across Australia.

A transcriptional signature of TGFβ-induced epithelial mesenchymal transition in cancer

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Epithelial-mesenchymal transition (EMT) is a developmental program subverted by cancer cells as they progress through the metastatic cascade. EMT is associated with an aggressive, migratory cell phenotype and it can contribute to clinical chemotherapeutic resistance and poor treatment outcomes. EMT can be induced by different stimuli, of which transforming growth factor β (TGFβ) is one of the best studied. We have used meta-analysis methods to identify a robust transcriptional signature of TGFβ-induced EMT, and then used this signature to distinguish cancer cell lines and patient samples with evidence of TGFβ-induced EMT. We examine the signature across multiple breast cancer and pan-cancer datasets, demonstrating that: our results are reproducible on independent data; cell-line and patient samples show consistent, cancer type-specific levels of TGFβ-EMT activity; and: our TGFβ-induced EMT signature is influenced by the accumulation of genetic mutations across the TGFβ signalling pathway. Finally, we apply our signature to stratify patients and show differences in survival outcome, and identify cell lines with resistance to common cancer drugs.

Carcinoma en cuirasse: A rare presentation of breast cancer – a case report

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Carcinoma en cuirasse is a rare form of cutaneous metastasis commonly associated with breast cancer. While metastasis to skin is common in breast cancer, the incidence of carcinoma en cuirasse is estimated at between 0.7 to 9%. We report the case of a 71-year-old female patient with metastatic oestrogen receptor positive, HER2 negative lobular breast cancer to the peritoneum, bones, pleura and lymph nodes. She also had a contralateral left sided oestrogen receptor positive, HER2 positive inflammatory lobular breast cancer initially treated with the combination of pertuzumab, trastuzumab and docetaxel. After cessation of weekly docetaxel after four cycles, the patient developed plaque-like, confluent lesions encaising the entire abdomen. This was associated with intense pruritus, disseminated erythema, indurated and thickened skin as well as oedema. Core biopsy of the skin was performed which showed infiltration of the dermal lymphatics with malignant epithelial cells. The cells tested positive for the oestrogen receptor and negative for the HER2 receptor. The patient was reviewed in the dermatology clinic for management of the pruritus and recommenced on docetaxel by the medical oncologist. After two cycles of weekly docetaxel the skin lesions significantly improved, the skin softened and erythema reduced. This case demonstrates the importance of biopsies in metastatic breast cancer patients to assess receptor status and guide treatment strategies. Carcinoma en cuirasse is a rare presentation of breast cancer however easily manageable with the combination of effective anti-cancer therapies and adjunctive medications to manage the associated dermatological manifestations.

Diary data from the Sexual Activity after Breast Cancer (SAB) Study

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Aims: Discomfort during sexual activity is common after breast cancer. Vaginal estrogens are effective but commonly avoided due to systemic absorption. Despite the large commercial market for vaginal lubricants, no randomized studies have compared products.

Methods: In a randomized, double-blind, AB/BA crossover design, participants used each lubricant for four weeks. Participants completed daily sexual activity diaries. For each episode using lubricant, participants reported details of lubricant application and discomfort, as well as highest level of discomfort using a 100-mm visual analogue scale (VAS).

Results: On average, women reported 6.5 sexual episodes during water-based and 7.4 during silicone-based treatment. For nearly all episodes, participants reported using lubricant on the vulva, vagina or both. Women reported vulvar discomfort during 42.0% of episodes using water-based lubricant, and 24.8% of episodes using silicone-based lubricant (p=0.07), and vaginal discomfort during 60.0% of episodes using water-based and 47.3% of episodes using silicone-based lubricant (p=0.2). Women reported internal pain on initial penetration for 66.1% of episodes involving water-based lubricant, and 24.8% of episodes using silicone-based lubricant (p=0.2). Women reported internal pain on initial penetration for 66.1% of episodes involving water-based lubricant, and 24.8% of episodes using silicone-based lubricant (p=0.2).
Results
Cancer Australia convened a multidisciplinary working group (WG) which included rep

Methods
health professionals within a multidisciplinary team with information to assist in the management of women with LCIS.

is usually detected as an incidental finding in core needle or excision biopsies of benign or malignan

Lobular carcinoma in situ (LCIS) is a non

Aims

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The highest quartile of MD independently infers a 4

of exactly what molecularly and structurally contributes to MD, a comprehensive body of knowledge is needed on MD that is

of magnetic resonance imaging (MRI) parameters

high MD. Previous studies have shown a significant increase in the amount of dense connective tissue in HMD regions, at the expense of adipose content (Huo et al., 2014). We are currently assessing Magnetic Resonance Imaging (MRI) parameters such as T2 spin-relaxation time constants (T2), along with Nuclear Magnetic Resonance Spectroscopy (NMR-spectroscopy) metabolite profiles, in LMD versus HMD material. These measurements will ultimately be combined with SWATH-MS proteomic profiling towards identification of the molecules that contribute to MD. The results of this study will form a valuable resource for the medical research community and a paradigm shift in breast cancer screening.

Slip and Slide: Findings from the Sexual Activity after Breast Cancer (SAB) Study

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Background: Discomfort during sexual activity is common after breast cancer and may be exacerbated by endocrine therapy. Vaginal estrogens are effective but commonly avoided due to systemic absorption. No randomized studies have compared lubricant products, despite a large commercial market. We aimed to compare efficacy and acceptability of two major types of lubricant, water-based and silicone-based, for discomfort during sexual activity in postmenopausal breast cancer patients.

Methods: In a single-center, randomized, double-blind, AB/BA crossover design, sexually active postmenopausal breast cancer patients used each lubricant for four weeks. The primary patient-reported efficacy outcome was total discomfort related to sexual activity (Fallowfield Sexual Activity Questionnaire Discomfort subscale SAQ-D, range 0-6, higher scores correspond to worse discomfort). Acceptability was measured by patient preference and reported intention to continue using the products. Participants also completed sexual activity diaries.

Results: Over 90% of participants experienced clinically significant sexually-related distress at baseline. Water- and silicone-based lubricants did not differ statistically in efficacy based on total sexual discomfort (difference 0.7, 95% confidence interval (CI) 0.1-1.4, p=0.06). In a post hoc analysis, pain/discomfort during penetration improved more during silicone-based lubricant use than during water-based (odds ratio 5.4, 95% CI 1.3-22.1, p=0.02). All aspects of sexual discomfort measured with diaries were reported more commonly with water- based lubricant than with silicone-based lubricant. Almost twice as many women preferred silicone-based to water-based lubricant than the converse (n=20, 65%, v. n=11, 35%). After the trial, all but one respondent (n=33, 86.9%) reported continuing symptoms of sexual discomfort. One participant volunteered that she was no longer sexually active due to ongoing discomfort. 88% continued to experience clinically significant sexually-related distress despite use of either lubricant.

Conclusions: Total sexual discomfort was lower after use of silicone-based lubricant than water-based, but many women continue to experience sexual discomfort and sexually-related distress.

Magnetic Resonance Imaging of Mammographic Density

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The highest quartile of MD independently infers a 4-6 fold increased risk of BC over the lowest quartile once adjusted for age and body mass index, second only to BRCA1/2 status. MD also has an impact on detection of BC using mammography: the increase risk of BC detected between mammograms from the highest versus the lowest quartile is disproportionately high (~17 fold). At this current time there is a lack of understanding of exactly what molecularly and structurally contributes to MD, a comprehensive body of knowledge is needed on MD that is informative to the scientific and clinical community. We aim to identify the molecules that contribute to MD, and the increased risk associated with high MD. Previous studies have shown a significant increase in the amount of dense connective tissue in HMD regions, at the expense of adipose content (Huo et al., 2014). We are currently assessing Magnetic Resonance Imaging (MRI) parameters such as T2 spin-relaxation time constants (T2), along with Nuclear Magnetic Resonance Spectroscopy (NMR-spectroscopy) metabolite profiles, in LMD versus HMD material. These measurements will ultimately be combined with SWATH-MS proteomic profiling towards identification of the molecules that contribute to MD. The results of this study will form a valuable resource for the medical research community and a paradigm shift in breast cancer screening.

Clinical guidance for management of lobular carcinoma in situ

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Aims

Lobular carcinoma in situ (LCIS) is a non-invasive neoplastic proliferation of epithelial cells within the lobules and terminal ducts of the breast. LCIS is usually detected as an incidental finding in core needle or excision biopsies of benign or malignant breast tissue. This guidance aims to provide health professionals within a multidisciplinary team with information to assist in the management of women with LCIS.

Methods

Cancer Australia convened a multidisciplinary working group (WG) which included representatives from professional colleges and groups including MOGA. A systematic review was undertaken to identify evidence on the management of LCIS to inform the development of the guidance document.

Results
Clinical practice guidelines for the management of menopausal symptoms in women with a history of breast cancer

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Aims
Both pre-menopausal and post-menopausal women with breast cancer frequently experience menopausal symptoms induced by their breast cancer treatment. These menopausal symptoms are often more severe than “natural” menopause. The aim of the current guideline is to provide evidence-based recommendations for a range of interventions for the management of menopausal symptoms in women who have been treated for breast cancer.

Methods
A multidisciplinary Working Group was established including medical oncologists. The body of evidence identified to inform the recommendations includes randomised controlled trials (RCTs) in women with a history of breast cancer, and published systematic reviews and specific RCTs (MS-FLASH) in a general menopausal population. Efficacy outcomes of interest were improvement in vasomotor symptoms (hot flushes, night sweats), sleep disturbance, vulvovaginal symptoms and sexual function, psychological wellbeing, and quality of life. Safety outcomes of interest included the incidence of breast cancer recurrence.

Results
Practice Points and graded Recommendations have been developed regarding the use of specific complementary therapies, pharmacological therapies and hormonal therapies for vasomotor symptoms, sleep disturbance, and vulvovaginal symptoms and sexual function. There was insufficient evidence to develop recommendations for the remaining symptoms.

Conclusions
These Guidelines propose a step-wise approach to management based on the relative safety (and then efficacy) of the different classes of treatment and the particular symptoms experienced by an individual woman. Accordingly, the first Recommendations are those for complementary therapies, followed by Recommendations for pharmacological therapies. Recommendations regarding the use of hormone therapies are presented last, as hormone therapies should only be considered for severe, unresponsive symptoms and after discussion with an oncologist. Further research is needed to address the effectiveness and safety of specific treatments in women who have been treated for breast cancer.

Implementing a standardized breast cancer database in a private hospital in Western Australia – a pilot study

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Background: Value-based healthcare (VBH) focuses on improving patient health outcomes while reducing overall cost of healthcare. The value in VBH depends upon the best patient outcome after treatment. Currently, treatment success is primarily measured by short-term clinical outcomes rather than with long-term patient-oriented outcomes. The International Consortium for Health Outcomes Measurement (iCHOM), an organization comprising of leading health experts and patient-oriented stakeholders, has recently developed a number of standardized datasets to measure both clinical and patient-oriented VBH outcomes in diseases such as breast cancer. Aim: The aim of this pilot study is to develop an implementation protocol for the ICHOM-based breast cancer standardised dataset to measure meaningful value-based outcomes within the St John of God Subiaco Hospital, a private hospital in Western Australia. Methods: Implementation of ICHOM’s breast cancer-specific standardized dataset will be rolled out in four stages: 1) engaging hospital- and patient-based stakeholders with implementation, 2) establishing a data-capture model allowing routine and efficient data collection, 3) measuring and analysing the captured data and 4) using this newly-acquired data to determine treatments which promote best patient outcomes. Results: While data are currently collected using both electronic- and paper-based formats, final data capture electronically allows for efficient data storage, frequent measurement and analysis of treatment outcomes and rapid feedback for data dissemination. Conclusion: The results of this pilot study will allow for a proof-of-concept VBH protocol to be rolled out to various breast cancer oncology units within St John of God Healthcare. This will allow continual monitoring and implementation of leading treatments which improve outcomes for patients diagnosed with breast cancer.
How do average women think about breast cancer risk and prevention? ‘A huge hot air balloon’

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Abstract

Aims: The aim of this qualitative project was to explore women’s perceptions of breast cancer risk and the potential strategies they would consider to improve their risk. We also aimed to understand what women believe they can do to reduce their risk of breast cancer.

Methods: A literature review was conducted to identify specific content included in existing sources of information and support, and interest in an internet program with specific content included.

Results: To date, 11 women have completed interview 1, and six interview 2. Detailed results will be provided at an upcoming conference.

Conclusions: This research was supported by Breast Cancer Network Australia’s (BCNA) Review and Survey Group. We acknowledge the women involved in the Review and Survey Group who participated in this project.

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Keywords: breast cancer risk, prevention, qualitative research, women.
Label-free Enrichment and Integrated mRNA-Sequencing Analysis of Single Circulating Tumour Cells from Blood Sample

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Aims: Understanding genetic and functional heterogeneity in tumour cells allows us to gain insight on the mechanisms underscoring drug resistance and tumour aggressiveness. In contrast to invasive primary tumour sampling, liquid biopsy approach using circulating tumour cells (CTCs) provides accessible tumour material to assess the molecular and phenotypic changes of disseminated tumour cells. In this work, we developed a marker-free workflow to isolate CTCs from breast cancer patient for mRNA-seq analysis.

Methods: The CTCs were enriched from 7.5 ml of peripheral blood sample using ClearCell FX®, a label- free spiral microfluidics- based system. The enriched cells were stained with Calcein AM (live cell marker), CellTracker™ Orange (Universal marker), and Alexa 647 conjugated antibodies before being stained with Calcein AM (live cell marker), CellTracker™ Orange (Universal marker), and Alexa 647 conjugated antibodies. Following selection of CTC, the Polaris system generates full-length cDNA for mRNA-seq analysis. Sequencing libraries were constructed using Nextera kit and sequenced with Illumina MiSeq/NextSeq.

Results: CTCs were isolated and successfully extracted for RNA and cDNA generation. Gene expression data shows considerable heterogeneity as analyzed by unsupervised hierarchical clustering. However, PCA analysis of CTCs with gene expression data from various cancer type cell lines show that the CTCs cluster away from the other cancer type cell lines, with closest gene expression profile to that of a breast cancer cell line.

Conclusion: We have demonstrated a workflow to isolate CTCs and perform high quality single cell mRNA sequencing. The workflow captures viable CTCs individually and could potentially allow functional perturbation studies to be performed at the single cell level.

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Luminal A Breast Cancer: Australian Regional Cancer Centre Experience

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Background

On average, one in eight Australian females will develop breast cancer and one in 37 women will die from it before the age of 85 years. Luminal A breast cancer is the most common subtype and in general, carry the best prognosis of all breast cancer subtypes. The aim of this study to describe pattern of care and outcomes of women with Luminal A breast cancer.

Methods

A retrospective analysis carried out at North West Cancer Centre (NWCC), Tamworth from 2009 to 2013. Luminal A subtype breast cancers are identified by oestrogen/progesterone receptors positive, HER2 receptor negative and low expression of proliferation genes (Grade 1 tumour).
Results
Total seventy-four patients with Luminal type A breast cancer identified during the study period. Median age at diagnosis was 64 years (range 42-90 years). Sixty (81%) patients were post-menopausal. Thirty-eight (51%) patients had screen-detected breast cancer. The median tumour size was 12.5 mm (range 2-60mm). Ten (14%) patients had positive lymph nodes. At diagnosis, fifty-four (73%) were Stage I, Fifteen (20%) were Stage II and five (7%) were Stage III. Twenty patients had a mastectomy and fifty-four underwent breast conservative surgery. Fifty-eight (78%) patients had received adjuvant endocrine treatment and thirty-six (49%) had radiation therapy. Twelve (16%) patients underwent adjuvant chemotherapy; ten of them had positive lymph nodes and remaining had high risk features. Four (9%) patients relapsed. Out of total five deaths, two died due to breast cancer. Sixty-nine patients are still alive. Five-year observed survival is 97.2%.

Conclusion
At our centre, Luminal A subtype breast cancer observed more commonly in older post-menopausal females and carries excellent survival outcome even in node positive patients; survival data are similar to what has been seen so far in the literature.

Toxicity and Adherence to Adjuvant Anti-estrogens and the Utility of Switching to Second-line Agents

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Aim:
To assess reported endocrine treatment toxicity and consequent adherence in a cohort of women with hormone receptor positive breast cancer treated at a single centre, including the success of anti-estrogen switching due to toxicity

Methods:
This was a single centre study at Royal Perth Hospital. Patients with hormone receptor positive breast cancer treated with curative intent were identified from the Breast Unit database. Patient reported treatment toxicity and adherence were obtained from case notes and clinic letters for endocrine therapy used. Outcome data were also obtained.

Results:
1921 patients were identified from the database from 1994-2011. 62% received tamoxifen as initial endocrine therapy, 13% letrozole, 18% anastrazole, and 5% ovarian suppression plus aromatase inhibitor or tamoxifen. At last follow up 31% were continuing on their first line endocrine therapy, 20% had ceased as a result of completion of first line therapy, 11% had ceased as a result of a planned switch of therapy, 5% had ceased as a result of development of metastatic disease and 26% had ceased as a result of treatment related toxicity. The most frequently listed toxicity resulting in treatment cessation was hot flushes with this given as the main reason for cessation for 27% of those who ceased endocrine therapy.

Of the 490 patients who ceased first line endocrine therapy as a result of treatment toxicity, 316 (64%) trialled a second line of endocrine therapy. Of those, 160 (51%) were recorded as able to tolerate second line treatment sufficiently to continue treatment to completion, last recorded follow-up or development of further breast cancer related event.

Conclusion:
A significant proportion of patients ceased first line endocrine therapy as a result of treatment toxicity. Trial of a second line of endocrine therapy where the first is ceased as a result of intolerance is worthwhile in this population.

Men get breast cancer too: a consultation project identifying men’s unmet information and support needs

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Male breast cancer accounts for less than one per cent of all breast cancers in Australia. The rarity of male breast cancer can contribute to a lack of awareness, delays in diagnosis and treatment, and experiences of isolation and stigma. Men diagnosed with breast cancer can find it more difficult to access appropriate information, and emotional and social support. The use of the colour pink to represent breast cancer awareness can also be an issue for many men, who do not feel that the colour resonates with them.

Aims:
This consultation project aimed to identify unmet needs and priorities for Australian men affected by breast cancer. The project did not aim to be a quantitatively representative study. Rather, it was undertaken to inform policy and program development within a consumer advocacy context, encouraging men to contribute as advocates.

Methods:
Using an action research methodology, the project involved in-depth qualitative telephone interviews with five men from around Australia who had been diagnosed with early or metastatic breast cancer.

Results:
The project identified that men with breast cancer can benefit greatly from access to gender-specific online communities and face-to-face support groups. The option of making contact with other male survivors was seen as important. Participants recommended that awareness campaigns encourage male breast cancer awareness, including more training for health professionals to improve communication and early diagnosis. Lastly, participants highlighted the need for male-specific information resources to be readily available at time of diagnosis.
Breast Cancer Clinical Quality Indicators

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Aim: Cancer quality performance indicators (QPIs) have been developed by international groups to provide evidence-based measurements that allow aspects of care to be assessed and compared. Little has been published in Australia on performance in relation to QPIs, which QPIs may be measured, and which may be locally relevant.

Methods: The Evaluation of Cancer Outcomes Registry records clinical information on cancer patients for the entire Barwon South Western Region (BSWR). During 2010 to 2012 there were 829 newly diagnosed breast cancer patients for the region. A selected set of QPIs (Scottish taskforce) were chosen to assess local patterns of breast cancer QPI compliance.

Results: QPI 1: Patients with stage I breast cancers should undergo Breast conserving therapy (BCT) whenever appropriate (Scottish taskforce recommendation 85% vs. BSWR rate 88%). QPI 2: Patients under 70 years undergoing BCT should receive post-operative radiotherapy within 1 year of diagnosis (recommendation 95% vs. BSWR rate 94%). QPI 3: Patients under 70 years with T1cN0M0 or Stage 2/3 triple negative breast cancers should receive chemotherapy within 1 year of diagnosis (recommendation 85% vs. BSWR rate 83%). QPI 4: Patients aged 50-70 years with node positive or G3 and ≥20mm breast cancer should receive adjuvant chemotherapy (recommendation 85% vs. BSWR rate 61%). QPI 5: Women under 70 yrs with T1bcN0M0 or Stage 2/3 HER2 positive breast cancers should receive adjuvant anti-HER2 chemotherapy within 1 year of diagnosis (recommendation 90% vs. BSWR rate 93%).

Conclusion: It is feasible to collect and report QPIs that measure aspects of care. Different QPI frameworks exist and the choice of framework may influence ease of reporting and results. BSWR results compared to Scottish QPIs were generally in line with recommendations, although there may be variation in delivery of adjuvant chemotherapy (QPI 4), likely explained by ER status.

Contemporary risks of recurrence after adjuvant radiotherapy of patients treated for primary breast cancer

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Aims:
Breast cancer treatment outcomes have steadily improved over the last 20 years. Results from randomised studies demonstrate the benefits of radiotherapy following breast conservation and post-mastectomy for selected patients. More recent international results demonstrate continued improvements in loco-regional control. The aim of this study was to determine recurrence rates in a contemporary Australian series and determine if local experience is in keeping with published benchmarks.

Methods:
This was a retrospective analysis of all breast cancer patients treated with adjuvant radiotherapy in a large regional radiotherapy centre between the years of 2009-2011. Patients with DCIS and neoadjuvant treatment were excluded. All cases were individually reviewed. The 5 year risks of developing local recurrence (LR), loco-regional recurrence (LRR), distant metastases (DM), disease free survival (DFS) and overall survival (OS) were calculated using Kaplan-Meier statistics.

Results:
A total of 419 patients received adjuvant radiotherapy during the study period, with 338 courses of whole breast radiotherapy (WBRT) and 83 of post-mastectomy radiotherapy (PMRT). The average age was 60 with a median follow up of 54 months. PMRT patients had higher T and N stage. The 5 year rates of LR and DM following WBRT were 1.6% (CI 0–3.3) and 3.1% (CI 0.9–5.3) with the corresponding rates following PMRT being 2.6% (CI 0.7–4.3) and 22% (CI 8–34) (there were no isolated regional recurrences). The overall 5 year DFS and OS were 93% (CI 88–97) and 95% (CI 91–98) respectively.

Conclusions:
These results provide local documentation of high loco-regional control rates for breast cancer in a contemporary series at relatively early follow up. These improved outcomes likely reflect improvement across diagnosis, surgery, pathology, systemic and local treatments.

Content analysis of clinical letters for breast cancer patients in the adjuvant setting – the first step towards automated extraction of clinical data

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The effect of laterality on rates of cardiac related hospital presentations and admissions following adjuvant radiotherapy for breast cancer

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Aim:
Cardiac toxicity following left sided adjuvant radiotherapy for breast cancer is well described although not common. The risk is well publicised and perception of risk may alter both hospital presentation rates and investigations. The aim of this study was to identify cardiac related hospital presentation after adjuvant radiotherapy for early breast cancer and assess whether there were differences based on laterality.

Methods:
This retrospective analysis included 396 patients treated with adjuvant radiotherapy within a single large regional centre between 2009-11. Patients with DCIS and neoadjuvant treatment were excluded as were patients who recurred. During the study period 80% of the regional population was served by a single public hospital and emergency department (ED) and these admission and ED records were analysed for all patients through to October 2015.

Results:
Median follow up was 54 months and the median age was 60. Tumours were left sided (L) in 204 patients and right sided (R) in 192 with no difference based on postcode, insurance cover or other factors that might influence hospital of presentation. There were 3 ED admissions for myocardial infarction (1 L, 3 R) for a crude incidence of 1%, with a further 18 patients presenting with unspecified chest pain (9 L vs. 9 R) and 7 other cardiac related ED presentations (3 L vs. 4 R). Serum troponin levels were checked at some stage in 42 patients (19 L vs. 23 R). Ten patients were admitted under the cardiology team (3 L vs. 7 R) with a range of diagnoses. No differences were statistically significant.

Conclusions:
Lateality of adjuvant radiotherapy for breast cancer does not appear to influence subsequent rates of ED presentation, cardiac related admission or troponin testing. Although presentation rates are likely incomplete assuming a proportion of patients presented elsewhere, laterality did not appear a significant factor in this.
The Evaluation of Cancer Outcomes Registry records clinical information on cancer patients for the BSWR. From 2010 to 2012 there were 829 newly diagnosed breast cancer patients for the region, with 401 (48%) discussed at an MDT.

Results:

Stage was recorded in the medical history for 69% of patients presented to an MDT and only 56% of patients not presented (p<0.01). Cases were predominately presented through the Barwon Health weekly one hour MDT – typically with a full agenda. Patients presented to an MDT had a higher proportion of stage II and III disease (Stage I (29%), II (24%), III (13%) and IV (3%)) compared to those not presented (Stage I (28%), II (17%), III (9%) and IV (2%), (p<0.01). Patients with MDT discussion more commonly received all three modalities of surgery, radiotherapy and chemotherapy (MDT 25% versus no MDT 18%, p<0.01). Presentation at an MDT did not appear to affect survival (HR 0.96 95%CI 0.59-1.57, p=0.88) after adjusting for age, tumour stage, treatment and number of comorbidities (as extracted from admission data).

Conclusion:
During the study period roughly 50% of patients were discussed at an MDT. Patients with higher risk disease requiring more complex treatment appeared more likely to be discussed suggesting that with constrained resources clinicians may select patients for MDT discussion based on clinical and other factors. Survival does not appear to be affected by MDT presentation in breast cancer.

The contribution of routine follow-up to the detection of breast cancer recurrence after treatment for early disease.

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Aims:
With increasing incidence and rising survival there is a growing population of breast cancer survivors in Australia. Cancer Australia guidelines recommend a minimum follow-up incorporating seven visits over the first five years, based on level IV evidence, making this a substantial consumer of medical resources. Accepted components include regular histories, examination and annual mammography. We have assessed the value of these individual elements of follow-up through a review of relapse detection mechanisms.

Methods:
We examined the method of detection and mode of recurrence for 241 women (12.5%) relapsing from an initial observed population of 1942 patients with estrogen receptor positive early breast cancer. Data was obtained from a multidisciplinary breast service database with further information accrued from medical records and death certification.

Results:
Relapses included 44 local, 20 regional, 51 contralateral (likely new primary), and 168 distant events. 147 (60%) patients recurred within five years, 75 (31%) between five and 10 years and 21 (9%) after 10 years. Mode of recurrence detection was available on 195 cases and included 21 (11%) detected in routine clinics, 113 (58%) by patient self-detection and early presentation, and 45 (23%) by routine mammography. 64%, 88% and 0% of such cases involved metastatic disease at first relapse. Eight clinic-detected events involved symptom investigation and 13 were locoregional recurrences found on examination, with five of the latter surviving. Initial treatment was endocrine in 55%, chemotherapeutical in 36% and radiotherapeutical in 7%. 2% of patients received best supportive care alone. In seven of the 195 cases relapse detection at an advanced stage potentially limited therapy.

Conclusions:
Overall only one in 10 recurrences were detected by routine follow-up processes, the majority of relapses being diagnosed following self-presentation with symptoms or through mammography. For the purposes of relapse detection, systems of routine mammographic surveillance and patient-driven symptom investigation should take precedence over routine clinic visits.

Guideline-adherent treatment for women with breast cancer: do they receive what the multidisciplinary team recommend and does this affect survival

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Introduction: Treatment recommendations for cancer patients are more likely to be consistent with clinical practice guidelines (CPG) when discussed at multidisciplinary cancer team meetings (MDMs). Adherence to CPG and patient compliance with recommended treatment(s) (i.e., completion of treatment that was started) may affect patient survival.

Aim: (i) To examine adherence of (a) MDM treatment recommendations to CPG and (b) treatment to CPG and MDM recommendations for women with breast cancer. (ii) To assess the effect of guideline adherent treatment and patient compliance on survival.
Coping with personal goal disturbance in the context of breast cancer: key findings and implications

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Introduction

Breast cancer presents unique challenges and demands that can disrupt or completely block the pursuit of important personal goals. Previous research has documented the use of goal-related coping strategies among cancer patients.

Aim: To gain insight into the nature of adaptive and maladaptive coping with personal goal disturbance following surgery for breast cancer.

Method

The study was a prospective, mix-methods design, involving semi-structured interviews with 32 female non-metastatic breast cancer patients at two, four and six months post-surgery. A novel situational assessment method captured goal-specific sources of interference and coping responses over time. Thematic and cross-case analytic techniques were used to characterise adaptive and maladaptive response patterns.

Results:

Participants exhibited four types of responses to personal goal interference – assimilative coping, accommodative coping, informed waiting, and passive responses. There was evidence of both adaptive (i.e. minimised interference and continued goal pursuit following coping response) and maladaptive (i.e. ongoing interference and blocked goal pursuit following coping response) response patterns over time. Facilitators and barriers to adaptive goal-related coping were also identified.

Discussion

The nature and efficacy of coping with personal goal disturbance varied across personal goals and over time among this sample of breast cancer patients. The novel situational assessment and analysis method afforded insight into adaptive and maladaptive coping responses to concrete instances of goal disturbance.

Axillary Web Syndrome and Trunk Cording Case Studies: Treatments, Procedures and Outcomes.

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Aims

Axillary Web Syndrome (AWS) and Trunk Cording have been recognized as a movement limiting complication after breast cancer surgery. Quality research is lacking regarding AWS. The aim of this research is to explore commonalities and variances of physical intervention programs used by experienced therapists, to guide research and clinical practice.

Method

Content analysis was applied to case studies submitted by therapists to an international project - Share Cording Protocols Project (SCPP 2014-15). Therapists provided data on movement restrictions, treatment interventions, timeframes and outcomes. Photographic evidence of cording before and after treatment accompanied the data. Peer and member checking were applied.

Results

Four therapists provided case studies to SCPP: 10 episodes of AWS, 3 episodes of trunk cording. AWS and pectoral muscle tightness were recorded at initial assessment in 11/13 episodes. Treatment sessions were commonly 45-30 mins. Treatment frequency varied from 1-20 sessions and 1-3 days / 18 weeks. Shoulder flexion and abduction gains ranged from 20-100 degrees and 60-130 degrees respectively. Therapists commonly used massage along cord and at adhesion, breast and axilla scar treatments, pectoral muscle stretch and a home program. Cupping and low level laser were innovative treatments used by single therapists. Exercise advice only and lymphatic massage were not used. Cording was still seen, although less, at the end of treatment in 12/13 episodes. Cording across the elbow created shoulder range variances dependent on measurement method. Cording occurred either soon after surgery, during chemotherapy, during or after radiotherapy and influenced therapy frequency in 7/13 episodes.

Conclusion
Mastectomy Scar Assessment - A review of POSAS Observer Scale

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Aim
Mastectomy is a variable associated with increased incidence of upper-body morbidity after breast cancer. Scar severity may contribute to this risk however there is no recognized mastectomy scar assessment. The Observer Scale (OS) from Patient and Observer Scar Assessment Scale (POSAS) has been evaluated in breast linear scar research but not for mastectomy scar tissue. This study investigates the suitability of OS to rate scar severity of two common scar types after mastectomy.

Method
Therapists indicating interest in mastectomy scar from Linkedin connections and Google searched websites (English) were invited to participate in an online survey. Each OS feature was surveyed for two scenarios: mastectomy linear scar (LS) and mastectomy chest wall adhesion (CWA) assessment. Therapists rated the level of importance of five additional instructions or skill requirements for each scar feature, with the aim of achieving a more reliable assessment of scar severity. Data from therapists reporting 2+ years of experience was evaluated.

Results
28 respondents met the experience criteria. Each therapist evaluated 4/9 scar types after mastectomy and many evaluated 9/9. CWA and LS assessment rated as strongly important in their practice (71%, 57%). Responders had high agreement (>90%) with the level of importance (5/6+6/6) for: clothing removal instruction for six OS scar features (LS, CWA) and scar palpation skills for the pliability feature (CWA). Sound agreement (80-90%) occurred for: scar palpation skills for vascularity (CWA), thickness and pliability features (LS) and knowledge of mastectomy scar types for thickness feature (LS, CWA). Reasonable agreement (70-80%) occurred for: scar stretch instruction for vascularity feature (LS) and pliability feature (CWA) and knowledge of scar types for most scar features. Mixed opinion (<55%) occurred for importance of photographic examples.

Conclusion
Modifications to OS instructions and observer training should be developed for mastectomy LS assessment. CWA assessment was more important for therapists, supporting the need for additional measurement tools for clinicians. Clarification of scar types evaluated in LS and CWA assessment is required as nine scar types are potentially within this zone.

Survival and cardiotoxicity for patients with HER2 positive, metastatic breast cancer treated with trastuzumab in routine clinical practice.

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Aims
We sought to compare survival outcomes and cardiotoxicity in patients with HER2-positive, metastatic breast cancer (MBC) treated with trastuzumab in routine clinical practice, versus those in a systematic review of randomised clinical trials.

Methods
We searched the medical records at Westmead, Liverpool and Macarthur Cancer Centres for patients with HER2-positive, MBC starting trastuzumab from January 2001 to December 2014. For each patient we recorded: demographics, tumour and treatment characteristics; survival from starting trastuzumab; and, frequency of cardiac monitoring and of cardiotoxicity. The survival distribution was summarised by the following percentiles (represented scenario): 90th (worst-case), 75th (lower-typical), 25th (upper-typical) and 10th (best-case). Survival and frequency of cardiotoxicity were compared with recent systematic reviews. Factors associated with survival were assessed with Cox models.

Results
The 116 patients had a median age of 53 years (interquartile range 45 - 62) and 49% were ER/PR positive. The median duration of first-line trastuzumab was 13 months (IQR 6-34). Survival times in months (vs. the systematic review) were: 90th percentile 7 (9); 75th percentile 14 (19); median 29 (33); and, 25th percentile 60 (51). The 10th percentile was not evaluable. The presence of liver metastases was associated with shorter survival (HR=1.77, 95% CI 1.12–2.82, p=0.02). Four patients (3.4%) developed symptomatic cardiotoxicity, similar to the frequency in clinical trials (4.7%). 53% of patients had a baseline cardiac assessment, and the median number of assessments per patient was 4 (IQR 2 – 6.5). 14% of patients had no cardiac monitoring.

Conclusion
Survival time from starting trastuzumab in routine clinical practice was somewhat shorter than in clinical trials, but the frequency of cardiotoxicity was similar, despite less cardiac monitoring. Oncologists should adjust their estimates of survival time for patients with baseline prognostic characteristics that differ from those in clinical trials.
Introduction: The concept of capacity and the corresponding ability to make independent decisions regarding healthcare and finances is complex, and currently has no clear “gold standard” for assessment. Patients' mental states and their capacity may change. This can lead to difficulties in managing their care, throughout treatment and particularly towards palliation and end of life.

Case description: Mr SC was a 75 year old man with epithelioid malignant mesothelioma. This was treated with standard chemotherapy, however after thirteen months of treatment he progressed and became palliative. His treatment was complicated by his wife and enduring power of attorney (EPOA) who refused to allow him to be managed with opioids. When alert and comatoses he requested opioids for pain and dyspnoea management; however once sedated, his wife would order their cessation. This culminated in the patient being independently assessed by a geriatrician and occupational therapist to determine his capacity. Once found to be of sound mind, he charged his EPOA so as to allow himself to be palliated effectively.

Discussion: The methods and tools used to assess patients and their capacities are varied. These range from the mini mental state examination and Montreal cognitive assessment to neuropsychological evaluation. Currently there is no “gold standard” assessment tool for determining capacity, and the general consensus consists of a multifactorial approach, with both medical and legal evaluations. In assessing capacity, it is important to bear in mind one should not infer an overall lack of capacity from lack of capacity in a specific area. Upholding a person’s autonomy and right to make their own healthcare decisions is paramount. This case highlights the complexities involved with assessment, and the need to focus on patients, their needs and best interests.


Development of a Qstream Knowledge Translation Program on Gynaecological Cancer Care for Advanced Trainees in Oncology

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Aim: To identify key learning topics within gynaec-oncology as prioritized by oncology trainees and senior clinicians. To design and implement an online spaced education program (“Qstream”) for dissemination of specialized gynaec-oncology cases to medical oncology advanced trainees. Methods: A three-round Delphi process was conducted to obtain consensus on key learning topics. In the first iteration, an open-ended questionnaire was sent to 3 senior clinicians and 16 oncology trainees who had completed their rotation in gynaec-oncology at Westmead Hospital. In the second iteration, the same participants were asked to rank the topics obtained in the first round according to their relevance for oncology trainees. The top-ranked learning topics were used in a third iteration to design case-based multiple-choice questions. Results: The response rates in the first and second round of the Delphi process were 10/19 (53%) and 11/19 (58%) respectively. 58 topics were identified. The top-ranked topics included the role of surgery in ovarian cancer, routes/dosing of chemotherapy in ovarian cancer, treatment of recurrent ovarian cancer, staging and first-line management of cervical cancer, treatment of gestational trophoblastic disease, CA125 criteria and pitfalls, treatment of advanced endometrial cancer and palliative care in gynaec-oncology. 19 case-based multiple choice questions have been developed for implementation in an online spaced education program. Conclusions: This study has identified a core set of learning topics relevant to oncology trainees in their practice of gynaec-oncology, and has demonstrated the willingness of trainees to be involved in the development of an educational program for their peers. The large number of identified topics will necessitate the continuous development of new cases. The feasibility of the program will be assessed amongst medical oncology trainees at Westmead Hospital, before its dissemination beyond our network and extension across other tumour streams is considered.

24 Hour SAE reporting on Weekends/Public holidays

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Background:
A retrospective analysis of Queensland patients with breast carcinoma with regards to relative frequency of axillary metastases depending on quadrant location of lesion

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Aims
In recent years, the concept of sentinel lymph node biopsy has seen a paradigm shift in axilla management. It is current practice to offer axillary dissection to breast cancer patients with tumours greater than 3 cm even if clinically and radiologically node negative. Our study assessed whether axillary lymph node involvement was associated with quadrant location in breast cancer patients after controlling for tumour size and grade.

Methods
This population based, retrospective study examined females in Queensland who underwent surgery for invasive ductal breast carcinoma between the years 2002-2012 (n=9152). Data was obtained from the Queensland Oncology Repository (QOR), a state wide cancer patient database that links cancer diagnosis data with death data from the registry of births, death and marriages (RBDM) and treatment data from public and private hospitals. Multivariate negative binomial regression was conducted to determine the effect of tumour size, quadrant and tumour grade on node positive disease status. Incidence Rate Ratios (IRRs) were obtained for each category within tumour size, quadrant and tumour grade when compared to the reference category selected for each variable.

Results
Breast cancer tumours were most commonly located in the upper outer quadrant (UOQ) of the breast (52%), followed by the upper inner quadrant (UIQ) (20%).

When compared to tumours located in the UOQ, tumours in the lower-inner quadrant \(^*\) (LIQ) and upper inner quadrant \(^*\) (UIQ) were less likely to be node positive \((RR\ 0.84, \ p=0.002;\ RR\ 0.68, \ p<0.001)\) while tumours located in the lower outer quadrant (LOQ) were more likely to be node positive \((HR\ 1.08, \ p= 0.040)\).

Conclusions
Consideration may be given to axillary clearance in patients with outer quadrant tumours of less than 30mm size who are clinically and radiologically node negative.
Treatment options for recurrent glioblastoma are limited, with second line chemotherapy offering only modest benefit. Bevacizumab has shown promising results and is offered as a treatment option to this patient cohort. The cost of bevacizumab for recurrent glioblastoma is significant and not covered by the Pharmaceutical Benefits Scheme. Support for the cost of bevacizumab is offered through a pharmaceutical company funded program, private health insurance reimbursement and patient contributions. Within the public hospital sector in WA, health services cannot accept patient contributions towards high-cost medication charges, therefore SCGH sought a solution which would enable their recurrent glioblastoma patients to access treatment. A private hospital-substitute service (chemo@home) was engaged, allowing patients to be referred for bevacizumab infusions. Patients are treated at home by chemo@home registered nurses, with medication supply being obtained from a private pharmacy. Between July 2015 and July 2016 twenty-seven patients received 135 doses of bevacizumab at home. There were no episodes of anaphylaxis-hypersensitivity, no unexpected toxicities and no additional safety concerns identified. Of the 27 patients, 10 were uninsured and 17 had private health insurance. Uninsured patients self-funded both the home visit and the cost of the bevacizumab. Chemo@home applied for reimbursement for the bevacizumab for all eligible patients with private health insurance. All claims applied for by chemo@home were accepted, with the maximum reimbursement for high-cost medication being paid by the fund to the member. Medical oncologist satisfaction relating to the chemo@home referral process, patient treatment and feed-back to the specialist, was high. Patient satisfaction was also very high, with many patients and their families commenting that they valued not only having access to the high-cost medication but also having their treatment in a domiciliary setting with chemo@home which offered them a highly professional, compassionate option that made treatment less intimidating and confronting than the day-unit.

Interfacing specialists: clinicians and ICT

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Introduction
The integration of technology into the clinical workflow reflective of patient care path required input from multiple teams in parallel to ensure analysis, design, procurement, testing and infrastructure were delivered within timeframes required to meet the ‘go-live’ deadline. Understanding the patient flow from all perspectives highlighted the number of systems used and how disparate they are and the multiple entry points for the same patient data which at times was entered 3 or 4 times. The expertise required to enable the implementation of the MOSAIQ application is geographically dispersed between Brisbane, Rockhampton and Townsville.

Methodology
To ensure the ongoing technical and clinical support of MOSAIQ met the end users requirements it was determined that the MOSAIQ application would be deployed through eHealth Queensland enterprise infrastructure.

Objectives/Aims
To enable the automation of mandatory activity reporting compliance with Corporate Reference Data Sets is essential for patient level and aggregate activity data collection. The projects deliverables have been communicated via wide range mediums such info-graphics for ease of distribution to ensure departments, divisions and work units were able to easily digest the information. The supported by Elekta engagement with subject matter experts, clinical and technical reference groups and workshops.

Results
The inclusion of such a diverse range of expertise has required commitment in maintaining communication resulting in the project being delivered on time.

Conclusion
The early involvement of expertise from more than forty groups both internal and external to Queensland health has provided a platform for future rollouts.

Biobanking at a Regional Tertiary Hospital: An initial experience and identification of barriers to patient consent

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Aims: A core requirement of translational cancer research is access to human tissue. The Wollongong Hospital Biobank was established in 2014 as part of the Centre for Oncology Education & Research Translation (CONCERT), a consortium of multi-institutional partners involving Illawarra Shoalhaven Local Health District (ISLHD) and South Western Sydney Local Health District (SWSLHD), Illawarra Health and Medical Research Institute (IHMRI), the Ingham Institute for Applied Medical Research and two Sydney universities. In this qualitative study we review our initial experience, with a particular focus of identifying patient barriers to consenting for biobanking.

Methods: We reviewed the records of all patients contacted by the biobanking officers for the first 18 months following establishment of the biobank. We examined consent rates, patient characteristics, and number and type of biospecimens collected. A comparison of the characteristics of patients who consented to banking to those who declined was then attended to identify patient populations less likely to participate in biobanking.

Results: We have collected 847 biospecimens, including surgical tissues (fresh frozen primary tumour and nearby normal tissues), formalin fixed/paraffin embedded surgical tissues, and corresponding blood samples (whole blood, plasma, serum, and Buffy coat) from 49 patients (14 oesophago-gastric, 25 head and neck, and 10 central nervous system cancers). The mean age of participants was 64.8 (range 22 – 80), with a male predominance (68.8%), reflecting the patient population of included cancers. The participation rate was very high (91%), consistent with the
Patients’ and Carers’ Preferences Regarding the Role of Rehabilitation following Oesophagectomy: A Qualitative Study

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Aim: Oesophagectomy with pre-operative chemotherapy with/without radiotherapy carries significant morbidity, and quality of life is often significantly reduced post-operatively for a prolonged period of time. Better preparation of patients for treatment might reduce treatment-related morbidity. However, it is not known about patients’ preferences regarding rehabilitation in this setting. We have undertaken a qualitative study to explore the views and needs of patients and their carers regarding peri-operative and post-operative rehabilitation following oesophagectomy.

Methods: A qualitative study involving patients who underwent oesophagectomy for cancer or pre-malignant disease at a single Australian tertiary hospital between 2013 and 2015. Patients’ carers were also interviewed. The transcribed discussions were analysed using Framework Analysis.

Results: Three focus group discussions and 8 individual interviews were conducted with 15 patients and 11 carers. The overarching theme was “getting back to normal”. The diagnosis of oesophageal cancer represented a disruption to the normal, pre-diagnosis trajectory of participants’ lives. During the pre-treatment phase participants reported varying expectations about getting back to normal with some preparing themselves physically and logistically. While the treatment phase included focusing on the present and trusting experts, the post-treatment phase was one of striving to get back to normal and was identified as the time rehabilitation (in the form of dietetics, physiotherapy and nursing care) was most needed. Few disadvantages to rehabilitation were noted, although some struggled to understand how rehabilitation would apply to their situation. Home-based rehabilitation was seen as ideal because travel was a potential barrier. Participants emphasised the importance of rehabilitation being tailored to individual needs/circumstances.

Conclusion: Participants valued post-treatment support for return to ‘normal’ or adapting to a ‘new’ normal. These findings have implications for tailoring post-treatment management following oesophagectomy.

Avoiding the Emergency Department: a Rapid Assessment & Supportive Care clinic in a busy Australian Cancer Centre

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Oncology patients often suffer acute medical conditions related to the underlying malignancy, or secondary to toxicity of treatment, which result in presentation to the Emergency Department. This often does not require admission, but short treatment which can be administered over several hours. Many oncology units already do this on an informal, ad hoc basis. In January 2015, our institution developed a Rapid Assessment & Supportive Care clinic, involving an avenue for unplanned assessment of oncology patients. This was coordinated by a nurse practitioner candidate, who then involved a medical officer from the oncology team as appro

Aim
This study examines the qualitative and quantitative outcomes of implementing the RASC clinic, and explores the challenges and barriers to establishing such a pathway.

Method
Prospective and retrospective data was collected over 18 months, with 12 months prior as a comparator. Clinical casemix data for presenting complaint and outcomes were examined for the most recent six months (analysis in progress)

Result
In the first 12 months of implementation, emergency department admissions decreased by 18% (203 versus 167), but admissions direct to ward (either from clinic or unplanned assessment) increased substantially (78 versus 55). Despite this, total admissions decreased by 6% (245 versus 258). The most common reasons for presentation were nausea, pain and implanted intravenous access issues.

Conclusion
The establishment of an avenue for timely assessment and management for patients who were not well enough to require hospital admission led to a reduction in admissions via the Emergency department, as well as less overall need for hospitalisation. Care was less fractionated, and patients either received timely outpatient care or admission facilitated directly to a ward. Quality of life was subjectively improved for patients with expedited access to care.

Developing an integrated framework to evaluate quality in cancer care

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We report the initial experience of our regional tertiary hospital cancer biobank. In our cohort, older patients, and those with NESB were less likely to participate in biobanking.
Cost minimalisation analysis comparing adjuvant radiotherapy with endocrine therapy in elderly patients with oestrogen-receptor positive, low risk, early breast cancer

Ee Siang Choong, Michael Chao, Belinda Yeo, Caroline Baker, Farshad Foroudi

Introduction:
Comparable ipsilateral breast cancer recurrence rates have been shown for adjuvant radiotherapy (RT) and endocrine therapy (ET) in elderly patients (>70 years) with oestrogen-receptor positive, low risk, early breast cancer (T1, Grade I/II, node negative)\(^1\). On this basis, we conducted a CMA to evaluate the direct costs of treatment and their common toxicities.

Methods:
Costs for three adjuvant treatments were included in this analysis: (i) Conventional whole breast RT (15 fractions)\(^1\), (ii) Aromatase inhibitor (AI) therapy (Anastrazole 1mg/day for 5 years) and (iii) Tamoxifen (20mg/day for 5 years)\(^2\). Costs to the healthcare provider over a ten year period were compared. Total cost (C) included total treatment cost (T\_C) and cost of toxicity management (C\_T\_M) where C=T\_C+C\_T\_M. Costs of treatment/investigations were estimated from Medicare Benefits Schedule (MBS) and drug costs were taken from MIMS (Australia). Common toxicities (>10% - on MIMS/trials) and rare but serious side effects (with significant health burden) were included in this analysis. Sensitivity test was applied to incidence rates (clinically relevant rates), drug costs (alternative product costs on MIMS) and also total cost (C) (±50%, ±25%, ±10%). Differential timing of cost was accounted for using discount rates (DR) of 3% & 5%.

Results:
C for RT, AI and Tam are $3015 (sensitivity range: $3015-3038), $6374 ($2256-11243) and $1044 ($475-1617) respectively. Osteopenia/osteoporosis treatment is the main driver of cost in AI treatment. It is also the most sensitive to variation in drug cost and incidence rates. AI treatment, currently the standard of care, was identified as being six times more expensive than Tam and twice as expensive as RT.

Conclusion:
This CMA shows that Tam is the most cost effective adjuvant therapy. AI is the most expensive where C is very sensitive to cost of bone health management which is a significant problem in this patient group.
Aim
To evaluate the extent to which shared follow-up care for EBC supports best practice care and to identify key enablers and barriers to its uptake.

Method
Following a demonstration of shared follow-up care for women with EBC (2009-2011), an evaluation to assess the extent to which the model supports the delivery of best practice follow-up care was conducted (2013-15). Follow-up appointments involving 505 patients across five sites were documented over a two year period to assess the extent to which best-practice guidelines were adhered to within a shared follow-up care model. A qualitative evaluation of patient and health provider experiences was also undertaken.

Results
The majority of appointments included completion of follow-up actions in accordance with guidelines. Compared to specialists, a significantly higher proportion of general practitioners addressed psychosocial issues, secondary prevention behaviours, menopausal status and other health conditions and reviewed family history. Mammograms were provided to 73% of patients at least annually, in accordance with guidelines. Shared follow-up care was also shown to improve patient satisfaction. Established partnerships between specialist and primary care was identified as a key enabler of shared follow-up care. Timely and effective communication between health care providers was critical to the successful delivery of this model of care.

Conclusion
The evaluation demonstrated that partnerships between specialists and general practitioners can support the best-practice provision of shared follow-up care for early breast cancer.


The South Australian Aboriginal Cancer Control Plan 2016-21 and the Value of Partnerships

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Background
The South Australia Cancer Clinical Network developed the inaugural Aboriginal Companion Document to the Statewide Cancer Control Plan (2011–2015) in response to recognised disparities in cancer outcomes for Aboriginal people. Maintaining the original partnership approach, SA Cancer Service (SACS) embarked on the next phase of this initiative in collaboration with the Aboriginal Health Council of South Australia (ACHSA), Cancer Council SA and the South Australian Health and Medical Research Institute (SAHMRI).

Aim
The SA Aboriginal Cancer Control Plan (SAACCP) 2016-2021 used an audit of outcomes from the previous plan as the precursor to develop an updated, community informed, evidence based plan for the next 5 years. Recommendations were to be pragmatic and have potential for tangible progress.

Process
Stakeholder engagement included varied and far reaching community consultations led and performed by an Aboriginal project officer. Quantitative and qualitative data from the Cancer Data and Aboriginal Disparities (CanDAD) project provided a sound and local evidence base for the plan and recommendations and strategies from relevant national and state policies and guidelines were also included. All stakeholders had opportunity to review the SAACCP 2016-2021 draft to ensure that the essence and priorities reflected were consistent with community, researcher and service provider views.

Outcomes
Utilising a model of wellbeing, the SAACCP 2016-2021 has a particular focus on reducing preventable cancers, detecting cancer at an early stage and improving coordination and access to culturally sensitive care along Optimal Cancer Pathways. Implementation of the SAACCP 2016-21 is planned to occur under the governance of a new SA Aboriginal Chronic Disease Consortium which will also oversee implementation of the SA Aboriginal Heart & Stroke and Diabetes plans. Key partnerships are expanding and there is growing confidence in the ability to progress real change together.

Breast cancer surgical indicators in Queensland: variations in practice

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We aimed to establish and apply a suite of breast cancer surgery indicators to administrative health data to track surgical practice in breast cancer care services for Queensland (Qld) hospitals.
The Qld Oncology Repository (QOR) compiles and collates administrative and clinical data from the Qld Cancer Registry together with hospital admissions, treatment and mortality data. Seven surgical practice indicators were applied to examine and compare surgical practice and timeliness of surgery in Qld hospitals for women diagnosed with invasive breast cancer between 2009 and 2013.

Breast cancer surgery was performed in over 70 public and private hospitals in Qld with a range between 1 and 345 definitive procedures annually. Compared with the Qld average there was significant variation in adjusted rates over the breast cancer surgery indicators, when analysed by individual hospital, comparable hospital groupings and public and private hospitals. The definitive mastectomy rate for all breast cancers was 45% (range 23% - 65%) and the initial mastectomy rate for T1 tumours was 23% (range 6% - 43%). The re-excision rate after breast conserving surgery (BCS) was 20% (range 6% - 42%) and the conversion rate of initial BCS to mastectomy was 15% (range 7% - 34%). The sentinel lymph node biopsy rate for T1 tumours with initial BCS was 84%, with the majority of hospitals exceeding the Qld average. The proportion of women receiving surgery within 45 days from histological diagnosis was higher in private hospitals (94%) compared with public hospitals (81%). 68% of Qld women receiving subsequent definitive breast cancer surgery waited less than 21 days from their initial surgery.

State-wide audit and comparison of surgical practice across Qld facilities provide surgeons, clinical teams and management with the opportunity to review clinical practice and processes, highlighting variation in surgical practice and identifying areas for improvement.

### Deployment and standardisation of MOSAIQ Medical Oncology in regional centres

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**Background:**
The introduction of IOIMS (Integrated Oncology Information Management System - based on MOSAIQ) provides a single oncology record enabling seamless access to patient information regardless of the location. The system is centrally deployed across more than thirteen Queensland Health facilities.

**Aims:**
The IOIMS implementation was to be a blueprint for Queensland Health and as such the configuration, processes and datasets had to utilise corporate reference data sets (CRDS) and recognised standards where available.

**Methods:**
A project was established with team members working collaboratively across the state. MOSIAQ Implementation Teams (MIT) were established and used to provide decisions and data. The technical deployment was managed centrally as well as via local IT support arrangements. Configuration was undertaken centrally drawing on the MITs and business reference groups for guidance. Clinical governance was achieved through three statutory bodies that oversaw the various project phases.

The IOIMS implementation chose Queensland Health corporate datasets as the basis for the practice management component. A care plan (protocol) working group was established with eviQ utilised as the source of truth. A structured approach to the care plan build, initial QA and endorsement process was documented and agreed.

**Results:**
The IOIMS implementation was completed in June 2016 and the clinical functionality is now in stabilisation phase. The ability to interrogate and supply information in a useful and timely manner is now being realised through centralised reporting. Clinical governance underpinned the implementation and facilitated end-user buy in.

**Conclusions:**
Standardisation offers a mechanism to provide quality information that is useful and recognisable both locally and corporately. The site implementations highlight that distance and a remote user base need not be problematic for health IT projects – as long as you have appropriate clinical governance, engagement and a collaborative approach.

### Senior Medical Oncology Clinic Audit - Examining the initial experience and geriatric assessment data from the commencement of the Senior Medical Oncology Clinic, at Gold Coast University Hospital.

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**Aims**
Australia has a growing ageing population. It is known that the incidence of cancer increases with age; and with this a higher rate of concurrent comorbidities and frailty. This has been shown to lead to deficiencies in the diagnosis of, and treatment of cancer in the elderly. This lack of a complete geriatric assessment may lead to over or under treatment.

The Senior Medical Oncology Clinic was started in June 2015 to provide a multifaceted geriatric assessment. This clinic was established to form a multidisciplinary, patient centred approach, to improve outcomes for senior cancer patients. The aim of this audit was to assess the initial experience of the Senior clinic.

**Methods**
Data was collected prospectively from the senior clinic (case) patients, and retrospectively from the general oncology clinic (control) patients. Data collected included functional status, co morbidities, medication, cognition, nutrition, psychological state, social supports, as well as basic demographics.
Results
The patients’ in both groups had similar demographics and malignancies, with the majority having later stage disease. None of the patient’s seen in the general oncology clinics had a complete geriatric assessment. Functional status was the best evaluated with 63% of control patients assessed. Less than 50% of general oncology patients’ had an assessment of their home living situation. Patients’ seen in the senior clinic had a 100% rate of geriatric assessment as part of their evaluation.

Rate of referral to allied health increased in the senior clinic patients (1% vs. 41%); however rate of referral to sub-specialties was approximately the same between both groups. Treatment with chemotherapy was reduced in the senior clinic patients; 48% compared to 65% of the general oncology patients.

Conclusion
The senior clinic improved the assessment of geriatric patients. In future a further audit is planned to assess long term outcomes of these patients.


Best practice cancer care in regional Australia initiative

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Introduction
Despite good overall cancer outcomes in Australia, variations in outcomes exist by location, population group and tumour type. Cancer mortality rates are higher for people living in rural and regional areas compared to those in major cities and cancer survival is lower. Under COAG’s National Cancer Expert Reference Group, National Cancer Workplan, Cancer Australia undertook two initiatives - Profiling of Regional Cancer Services and Best Practice Cancer Care initiatives to map and identify opportunities to enhance best practice cancer care in regional areas.

Aim
To identify opportunities to enhance best practice cancer care in regional areas and address disparities in cancer outcomes for people living in regional Australia.

Methods
In collaboration with all states and territories, Cancer Australia mapped the status of 34 regional cancer services, by services provided and referral pathways, for six common and seven complex/high-risk cancers at a point in time and compared this data against national cancer clinical service capability frameworks. These findings were further analysed alongside nationally endorsed Optimal Care Pathways to identify opportunities for enabling best practice cancer care in regional Australia.

Results
Cancer Australia is working with states and territories across Australia to enhance best practice cancer care aligned to the principles of optimal care pathways including patient-centred care, safe quality care, multidisciplinary care, supportive care, care coordination, communication and research and clinical trials. A national forum will be held to improve outcomes for people affected by cancer in regional Australia by strengthening best practice care through shared learning across jurisdictions and services.

Conclusions
Enhancing best practice cancer care in regional Australia to support access to cancer care at the right time, in the right place, with the right expertise and capability, will support improving outcomes for regional Australian’s affected by cancer.

Trastuzumab in HER2 positive early breast cancer: A retrospective audit in a regional cancer centre

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Aim: To review the usage of Trastuzumab and management of its complications in HER2 positive early breast cancer (EBC) in a regional centre.

Methods: A retrospective clinical chart review was performed on all patients with HER2 positive EBC treated at Toowoomba Base Hospital between September 2010 and June 2016.

Results: 51 patients with HER2 positive EBC were identified. All were female. More than half (51%) lived further than 100 km away from the hospital, the furthest being 617 km. Axillary lymph nodes were involved in 19 (37.3%) women. All women were offered adjuvant therapy. Only one declined. The majority, 42 (82.4%), received adjuvant therapy less than 8 weeks post-surgery. The preferred regimes were Docetaxel-Cardoplatin-Trastuzumab (TCH) and Doxorubicin-Cyclophosphamide-Docetaxel-Trastuzumab (ACTH) administered to 22 (43.1%) and 17 (33.3%) women respectively. 3-weekly Trastuzumab was planned for 17 cycles (52 weeks). All women receiving Trastuzumab had regular echocardiograms. Six (11.8%) women had Trastuzumab-related cardiomyopathy. Five of these women were on an anthracycline-containing chemotherapy regimen. One other woman was on TCH. Delays in administration of Trastuzumab due to cardiomyopathy ranged from three to 16 weeks. One woman ceased Trastuzumab prematurely due to persistent cardiomyopathy. There was specialist cardiology involvement with four of these six women. Approximately eight (15.7%) women had local or distant recurrences. Three occured while on Trastuzumab.
A framework and toolkit for mapping and localising cancer referral and diagnosis pathways

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Nicole Rankin7

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2. The Cancer Institute NSW, Sydney
3. South West Sydney Local Health District, Liverpool
4. Northern NSW Local Health District, Lismore

Aims: To improve appropriate and timely referral and diagnosis by identifying best-practice diagnostic and referral pathways for lung cancer, to facilitate and support the local implementation and evaluation of the national Optimal Care Pathway across NSW.

Methods: Develop a toolkit for the mapping, development and dissemination of localised lung cancer referral and diagnostic pathways at two local health district (LHD) pilot sites. Following a literature review of lung cancer pathway implementation and evaluation, best-practice lung cancer diagnosis and referral pathways were identified. A priority setting workshop was held to gain consensus on pathway and implementation options for toolkit design. In collaboration with the Cancer System Innovation Managers (CSIMs) Community of Practice (CoP) and pilot sites, the toolkit including; mapping methodology, audit tools, qualitative interviews, and an implementation strategy were piloted over six-months. The evaluation measured pilot site’s experience and outcomes of mapping and developing pathways.

Results: This project delivered a framework and toolkit for mapping, developing and disseminating the localised lung cancer Optimal Care Pathway, which was endorsed and implemented by the Cancer Institute NSW. Pilot and non-pilot sites reported that peer engagement though the CSIM CoP provided opportunity to share challenges and solutions to project management, data access, medical audits, and stakeholder engagement. Both sites reported that early engagement of clinicians and GP liaisons was advantageous to change management and pathway dissemination. Surveys captured that Respiratory Physicians acted as champions and an active presence in the MDT was critical project success.

Conclusion: The Toolkit provides a valuable resource for CSIMs seeking to improve the patient experience and outcomes. This project contributed to the generation of localised referral and diagnosis pathways in LHDs. It is recommended that services without defined cancer care pathways replicate the pathway development using the Toolkit.

COMPARISON STUDY OF INTEGRATIVE MEDICINE CENTRES IN AUSTRALIA, U.S.A., AND GERMANY.

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Aims:
There is substantial interest in integrative oncology care to improve the health and wellbeing of cancer patients in Australia, but limited evidence to guide service development. Here we describe and contrast integrative care centres in Australia, U.S.A., and Germany to inform development of an Australian model of integrative oncology care.

METHODS:
We conducted a mixed method study including a 28-item survey and semi-structured interviews in 16 centres providing integrative care in Australia (10), U.S.A. (3), and Germany (3). A coding schema based on survey responses and interviews was developed and used to compare and contrast services within and between countries.

RESULTS:
Common elements across countries identified included ongoing academic activities for medical staff and patients, and importance of open collaboration and communication. German and U.S.A centres had a General Practitioner (GP) or Integrative Physician (IP) as gatekeeper, whereas Australian centres were coordinated by allied health practitioners (AHPs). Major differences were:

1. Perception of IM: Australia and USA perceive IM as adjunctive, while in Germany it is parallel with western medicine. Australian centres support patient self-management through empowerment and value social interactions between patients, and patients and practitioners;
2. Treatment options: Australian focuses supportive care, USA body-mind, and German traditional healing therapies.
3. Team interaction: USA and German had strong focus on structured and Australian informal interactions.

Conclusion: Usage of Trastuzumab and management of Trastuzumab-related cardiomyopathy were in line with recommended international guidelines. The incidence of Trastuzumab-related cardiomyopathy was higher than larger studies and the risk increased with an anthracycline-based chemotherapy regime. There were no issues with compliance due to travel distance.

CONCLUSIONS:
Building a web-based system to facilitate health services adherence to the Clinical Pathway for the Identification and Management of Anxiety and Depression in Adult Cancer Patients.

Lindy Masya1, Heather L Shepherd1, Melanie A Price1, Joanne Shaw1, Haryana M Dhillon2, Karen Allison1, Phyllis N Butow1, and the ADAPT Program Group

Aims
This study aimed to develop a web-based system to operationalise the Clinical Pathway for uptake in NSW Health oncology settings to facilitate services implementing the Clinical Pathway.

Method
Using a three phased approach, phase one mapped recommendations of the Clinical Pathway to patient care practices (i.e. identification, referral, treatment and treatment outcome) providing a system framework. A task analysis identified user interactions, time requirements and alignment with common workflow practices. The second phase, incorporated human factors design for the User Interface. The third phase tested human computer interaction and user acceptability of the system’s interface with 6 health professionals (nurses/psychologists/oncologists) using observational technique and think aloud sessions.

Results
Operationalising an evidence-based clinical pathway is viable to support the adoption of such guidelines. However, difficulty lies in defining functionality boundaries in facilitating Clinical Pathway implementation rather than dictation of clinical practice. Building the web-based system highlighted that iterative design, and an intuitive user interface incorporating automated functionality and responsive web design, are vital in building a system for busy health professionals.

Implications
This study contributes to the ADAPT Program which is investigating clinical pathway implementation strategies via a cluster RCT across 12 NSW oncology health settings. The system is currently being piloted at a health service.

The National Framework for Gynaecological Cancer Control

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Aims
Gynaecological cancer is the third most commonly diagnosed cancer among women in Australia and accounts for about 8.6% of all cancer deaths in women.1 Projected increases in the number of new cases and improvements in 5-year relative survival rates (59% in 1982-86; 68% in 2007-11)2 have increased the number of gynaecological cancer survivors. A strategic approach is required to improve outcomes for women with gynaecological cancers in Australia and to meet increasing pressures on the health system. Cancer Australia has developed the National Framework for Gynaecological Cancer Control (‘the Framework’) which identifies national priority areas for action across the cancer control continuum, including prevention, screening, diagnosis, treatment, follow-up, supportive and palliative care, and research.

Methods
An expert gynaecological cancer advisory group oversaw the development of the Framework. Analyses of epidemiological data, a literature review and national consultations with key stakeholders were conducted. Findings were analysed by the expert advisory group according to the following thematic elements: cancer control continuum; priority population groups; evidence-based practice; and research, evaluation and continuous improvement.

Results
Six national priority areas for action have been identified:

- Enhancing the centralised model of treatment planning
- Improving outcomes for Aboriginal and Torres Strait Islander women
- Promoting a holistic approach to person-centred care
- Developing sustainable models of care
- Enhancing health promotion and public awareness
- Targeting research funding
The Framework incorporates evidence-based strategies and allows flexibility for jurisdictions and health service organisations to address each priority within their specific service environment.

**Conclusions**

Through the development of nationally agreed, evidence-based priority areas in gynaecological cancer control, the Framework will guide national efforts to improve gynaecological cancer outcomes.


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**The Lymphoedema Clinical Pathway Pilot Project - a community based approach to improve lymphoedema management**

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It has been identified that lymphoedema management services within the northern sector of the Metro North Hospital Health Service (MNHHS) were not being delivered to the same capacity as those in the southern sector. A consultation process including consumers, MNHHS staff, private service providers and non-government organisations (NGOs) identified that development of a clinical pathway in accordance with best practice models could assist with the provision of improved services to the northern sector. This informed the development of the MNHHS Lymphoedema Clinical Pathway Project. The pathway was launched in April 2016, with evaluation exempt from ethics review. It seeks to link patients more effectively with available lymphoedema management services and to improve the utilisation of primary care services instead of hospital based services. A government-funded program has increased the capacity for the identification and management of cancer-related lymphoedema within primary care. The pathway recommends that patients are screened for their risk of developing cancer-related lymphoedema and if risk is determined they are monitored by a trained GP. The GP then refers to a trained community health professional to manage this lymphoedema.

To date 37 community health professionals (GPs and practice nurses) have been trained in the early identification of lymphoedema. Results from training indicate a 3.3 point increase in self rated confidence and a 3.3 point increase in self rated knowledge levels (on a ten point scale) related to monitoring patients with risk for lymphoedema. 38 patients have been screened and assessed to have lymphoedema risk. NGO lymphoedema referrals have increased up to 161% since 9 NGO staff completed lymphoedema management training. The intended outcome of this pilot is a decrease in reliance on the hospital as the primary centre for lymphoedema management, with potential application to other clinical services.

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**Off the bench: why oncology specialists need to step forward for Lynch syndrome**

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1. Lynch Syndrome Australia, Cottonvale, QLD, Australia

**Background:**

Families with Lynch syndrome (LS) are at heightened risk of multiple cancers and therefore require lifelong surveillance for early detection and treatment. Although an estimated 100,000 Australians carry the LS gene fault, no practitioner is designated to place to lead the coor...
Early detection of pre-clinical breast cancer related lymphoedema: Is screening using bioimpedance spectroscopy effective?

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Background
Screening for breast cancer related lymphoedema (LE) is recommended best practice to allow early detection and early intervention, potentially preventing progression of LE. Bioimpedance spectroscopy (BIS) is used to screen for LE in patients pre and post axillary surgery, and is used to screen LE at the Peter MacCallum Cancer Centre (PMCC). Known predictors of LE in this population include; number of lymph nodes removed, number of positive nodes, extent of surgery, and BMI >30.

Aims
- Determine prevalence of LE
- Examine predictive utility of BIS measures for identifying LE at standardised time points of assessment
- Identify patient and hospital factors associated with increased risk of diagnosis of LE.

Methods
A retrospective cohort study was conducted reviewing patient histories of all patients undergoing axillary surgery at PMCC from 2007-2013. 192 patients were included in the study who had BIS screening pre and/or post operatively with 172 from the breast stream. A logistic regression analysis categorised patients into ‘LE diagnosis’ or ‘No LE diagnosis’. Potential covariates were: age, gender, BMI; hand dominance; cancer diagnosis, tumour stream, and surgery type; number of nodes removed and number of nodes positive; hospital length of stay; post-operative complications; necadjuvant and adjuvant therapies; BIS measures pre- and post-operatively (and time point); time point LE was detected; and interventions post LE diagnosis.

Results
The prevalence of LE was 15.1% in the included patient cohort. BIS has a statistically significant predictive utility of 84% when the pre-operative and first three post-operative measures have been taken (p=0.006). Two individual variables were significantly associated with the development of LE; post-operative complications (p=0.026) and year of surgery (p=0.007).

Conclusions
BIS is a highly effective clinical tool with high predictive utility suggesting at least 17 months of screening post axillary surgery to capture all cases of LE.

A systematic review of comparative effectiveness models and economic evaluations for cancer risk management strategies in BRCA1/2 mutation carriers

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4. Department of Medicine, University of Melbourne, Melbourne, Victoria, Australia

Aims
To identify and evaluate studies addressing the effectiveness and cost-effectiveness of cancer risk management interventions for BRCA1/2 carriers.

Methods
A systematic search of academic databases and grey literature was performed for decision analytic models and economic evaluations of breast and ovarian cancer risk management in BRCA1/2 mutation carriers, including any combination of surveillance, prophylactic oophorectomy or mastectomy, or risk reducing medication.

Results
Thirty-two studies were included from 2504 identified, comprising 8 decision models and 24 economic evaluations. Eleven were concerned primarily with the utility of cancer genetic services or performing genetic testing, with limited modelling of downstream risk management intervention pathways. Prophylactic bilateral salpingo-oophorectomy (19/32), mammography (19/32) and prophylactic mastectomy (16/32) were the most frequently evaluated interventions, and breast MRI featured in publications from 2005 only (12/24). Risk reducing surgery, namely bilateral salpingo-oophorectomy with or without bilateral prophylactic mastectomy, was consistently the most cost-effective approach. In contrast, the addition of breast MRI to mammographic surveillance produced discordant results. Although MRI resulted in increased quality-adjusted life years, its high ongoing costs lead to several studies finding the use of MRI was not cost-effective compared to either no surveillance or mammography alone.

Conclusions
Analyses of cancer risk management for Australian BRCA1/2 mutation carriers are sparse. Direct comparisons of study outcomes are problematic due to differences in: (1) the defined study population, (2) choice of comparator intervention, (3) timing of interventions, and (4) health-care systems. Although a reasonable proportion of studies modelled the effect of higher uptake of risk management by patients, there is limited consideration of how health-care service delivery could be optimised to achieve this.
Safety audit of accelerated Bevacizumab infusions: a single centre retrospective cohort study

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Aims
Increasing time constraints facing the Cancer Day Unit at Gold Coast University Hospital necessitated the adoption of an accelerated bevacizumab infusion protocol. A safety audit was carried out in order to assess the incidence of infusion-related hypersensitivity reactions, hypertension and proteinuria between the accelerated infusion protocol (30 minutes C1, followed by 10 minute subsequent infusions) versus the standard protocol (90 minutes C1, 60 minutes C2, followed by 30 minute subsequent infusions).

Methods
Data was collected retrospectively for Cohort 1, who received the standard infusion protocol between 1/7/13 and 31/5/14, and prospectively for Cohort 2 who received the accelerated infusion protocol between 1/7/14 and 31/5/15. Eligible subjects included bevacizumab naïve patients being treated for metastatic colorectal cancer at a dose of 5mg/kg or 7.5mg/kg. Adverse events were graded according to the NCI-CTCAE grading criteria.

Results
A total of 27 eligible patients were included in cohort 1, and received 141 bevacizumab infusions, with 1 documented infusion-related hypersensitivity reaction (grade 1) in a patient receiving their first cycle over 90 minutes. Cohort 2 included 28 eligible patients who received 168 infusions, with no documented hypersensitivity reactions.

Blood pressure was documented on 137 occasions for cohort 1, and 164 occasions for cohort 2. Episodes of hypertension were classified as grade 1 (40% versus 49%), grade 2 (27% versus 27%) or grade 3 (4% versus 4%) for cohorts 1 and 2 respectively. Urine dipstick results were documented on 96 occasions for cohort 1 and 102 occasions for cohort 2, with episodes of proteinuria classified as grade 1 (11% versus 10%), grade 2 (2% versus 1%) or grade 3 (2% versus 1%) for cohorts 1 and 2 respectively.

Conclusions
There was no increase in infusion-related hypersensitivity reactions, hypertension or proteinuria with the accelerated infusion protocol compared with the standard infusion protocol.

3. Mahfoud T, et al. Bevacizumab 5 or 7.5 mg/kg in metastatic colorectal cancer can be infused safely over 10 minutes. J Gastrointest Cancer. E-pub Date: January 2011. DOI # 10.1007/s12029-010-9245-x
6. National Cancer Institute CTCAE Version 4.03 (June 14, 2010)

Implementing a Framework for Quality Care (Cancer): Optimal Care Pathways

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Introduction: The pathway for cancer patients undergoing diagnosis and treatment for cancer is complex and often poorly comprehended by those involved. The development of Optimal Care Pathways (OCPs) for 15 specific tumour types map the patient journey in such a way the whole pathway and its distinct components promote the delivery of consistent quality cancer care.

Objective: To describe the framework and progress of implementation for the nationally endorsed Optimal Care Pathways in Victoria across all sectors that provide care to patients with a cancer diagnosis.

Method: In early February 2016 the Victorian Department of Health and Human Service (DHHS) prioritised the implementation of the Lung and Colorectal OCPs across all aspects of the health sectors. Harnessing the expertise and resources of the Victorian Integrated Cancer Services, in collaboration with partner organisations such as Primary Health Networks, a service redesign approach was adopted to provide a structured coordinated framework for implementation. Major focus of initial activity centred on identifying variation and determining how best to align such practices with OCP recommendations. Resulting actions are expected to involve co-design with consumers, as is standard for a redesign approach.

Results: First stage reporting has provided a local lens (metropolitan and regional) within a state wide context. Such knowledge is assisting the identification of opportunities to better align access and timeliness within the entire care trajectory. There is a clear expectation in the Victorian strategy that alongside indicators of efficiency, quality indicators such as communication and support are equally weighted in implementation initiatives. It is hoped that with this coordinated activity, patient needs will be addressed fully and in a timely manner to ensure a good quality of life.
A Systematic Review and Meta-Analysis of Patient Reporting Outcomes in Clinical Practice

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Background: Patient Reported Outcomes are assessment tools widely used in clinical trials and health economics to globally measure patient functioning. Their use in clinical practice is promising but still lagging. This systematic review and meta-analysis has three purposes. Firstly, collate the research to date about the use of Patient Reported Outcomes in clinical practice. Secondly, establish the benefit for individual patients. Finally, articulate gaps in the literature for the planning of future research.

Methods: A search of the literature was conducted (1966- July 2016) from databases including MEDLINE, Embase, CINAHL, PubMed, Scopus, PROSPERO, Cochrane and Joanna Briggs, as well as guidelines reports from Nice, CEBM, NHS, Promis and ISOQOL. ClinicalTrials.gov, clinicaltrialregister.eu and the WHO ICTRP were searched for unpublished studies. More than 5000 studies were identified, and 42 met eligibility criteria. The Cochrane Risk of Bias tool was applied to eligible studies, and statistical data was entered into Cochrane Review Manager (RevMan).

Arksey and O’Malley’s framework was used to correlate the eligible studies. Results: Patient Reported Outcomes are most commonly used to predict prognosis, but increasingly to manage quality of life and mental health outcomes in clinical practice. This review identified greatest benefit for patients and healthcare professionals when using Patient Outcome Reporting to manage toxicities and disease burden. With regards to outcomes, several studies established a benefit for management of the symptoms of disease and reduction in treatment toxicities. The uses for Patient Reported Outcomes are wide ranging, resulting in a broad scope of reported benefit. Conclusions: This review identified gaps in the evidence. In future research, the engagement of clinicians, utilisation of technology for data collection and guidance on how to respond to patient reported outcomes information must be prioritised. There is an identified benefit for patient outcomes, a clear opportunity for better personalised care and implications for improved service delivery.

The utility of the Medical Oncology Morbidity and Mortality Review process. A tertiary teaching hospital experience

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Aims:
Mortality rate, especially early post intervention mortality, is a common indicator of healthcare quality. Regular mortality reviews are core clinical component of all units in the Southern Adelaide Local Health Network. We set out to examine the initial processes of the newly established Medical oncology Department’s Morbidity and Mortality meetings (MM) to evaluate the pattern of cases and impact on Department policies and practice.

Methods:
Physician led MM review committee was established through invitation of relevant medical, nursing and allied-health professionals from Flinders Medical Centre Oncology Unit in May 2013. All deaths were discussed and coded during scheduled multi-disciplinary weekly ward meetings. All deaths < 30 days of systemic anticancer therapy (SACT), deaths or morbidity that was judged to be unanticipated (UA) or to have any quality improvement opportunity (QIO) were then discussed in detail at the monthly departmental MM meeting. Results:
3105 patients initiated a new SACT between May 2013- July 2016 in the unit. 120 inpatient deaths occurred and were coded; 53 cases (mortality=44, morbidity=9) were referred to the MM committee for further review. 31 male and 22 female patient cases (age range 41-85 years) were discussed. Primary cancer diagnosis in majority was lung (n=13), followed by colon (n=8) and breast cancers (n=7). 90% had metastatic disease. The most common chemotherapy regimen received in the preceding 6 months was 5FU/CAPOX/FOLFOX +/- Bevacizumab. Mortality rate <30 days of SACT was 1% (n= 28). 11 cases were identified to have QIO and 13 cases were deemed UA. As a result of MM review process 3 clinical audits are underway and 3 consensus departmental guidelines have been developed.

Conclusion:
Our experience shows that departmental MM review process is feasible and ensures all inpatient deaths are systematically reviewed. This process identifies QIO and can lead to quality improvement measures for implementation.

Improving methods for the identification of malnutrition in culturally and linguistically diverse patients

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Implementation of the Medication Management Plan (MMP) in Private Day Oncology Hospitals

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The National Medication Management Plan (MMP) is a standardised form developed by the Australian Commission on Safety and Quality in Health Care (ACSQHC) to improve the depth and accuracy of the medication history process. Historically, Icon Cancer Care’s Medication History form was intended for patient completion prior to initial presentation. This medication history process required improvement to enhance the quality of information gathered by pharmacists. To date, there is no nationally standardised tool specifically for outpatients in a healthcare setting.

The aim was to implement the MMP nationally across Icon day hospitals and standardise the medication history procedure while measuring the clinical benefit of its use in an outpatient setting.

Implementation involved collaboration between medical, nursing, pharmacy and administrative staff. The national MMP document was adapted to better suit a day hospital outpatient setting. A formal process outlining the intended use of the MMP and a competency assessment tool for pharmacists was developed. In order to support the implementation, an educational workshop was held for pharmacists and a presentation targeting nursing and administration staff was delivered.

The adapted MMP for outpatient use will ensure the standardisation of our medication history process and optimise medication management within the Icon Cancer Care day hospitals. Data is being collected to measure the impact on medication safety, clinical decision making, incidence of medication related incidents, multidisciplinary team collaboration and improved adherence to national standards set out by the ACSQHC.


Trials and Tribulations of a Regional Oncology Clinical Trials Unit

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Introduction:
Access to clinical trials is an essential part of any medical oncology service. The challenges faced in setting up a regional oncology clinical trial unit...
Methods: The Goulburn Valley Health (GVH) Oncology Unit was established in early 2012 with the recruitment of 2 consultant medical oncologists. The oncology clinical trials unit was set up in August 2012. We hereby describe some of the challenges faced and the clinical trials in which we have participated.

Results: The various challenges faced include: 1) recruitment, retention and ongoing funding of a trial coordinator; 2) setting up a patient database for trial feasibility; 3) setting up internal workflow processes for costing; 4) interest of pharmaceutical companies in regional site participation and access to novel pipeline compounds; 5) acceptance by clinical trial alliance groups of a regional site; 6) institution-wide understanding of what research means and the importance of an oncology clinical trials unit; 7) public education of the importance of clinical trials for oncology patients and 8) constraints in resources and time of a limited medical and nursing workforce. Membership with various tumour stream trials collaborative groups has enhanced access to and participation in clinical trials. Cancer Council Victoria also has assisted by having trials opened at our centre published on their website. To date, we have opened 6 clinical trials amongst various tumour streams including breast, bowel and prostate cancers. Thirty-nine patients have been screened and amongst them, 26 successfully enrolled onto the studies. We are also participating in nation-wide cancer database registries and expanded access programs.

Conclusion: Setting up and sustaining an oncology clinical trials unit in a regional centre has its many challenges. The value of access to clinical trials for regional oncology patients and the intangible return of being on the oncology radar screen are priceless!

Cross-cultural adaptation of ‘Cancer Care Coordination Questionnaire for Patients’ (CCCQ-P) for Chinese- and Arabic-speaking people

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Background: People from culturally and linguistically diverse (CALD) backgrounds are at high risk of experiencing poor coordination of care, yet are often excluded from research to improve services due to the lack of culturally-appropriate measurement tools in community languages.

Aim: To cross-culturally adapt the CCCQ-P (Cancer Care Coordination Questionnaire for Patients) instrument into Traditional and Simplified Chinese and Arabic for migrants within Australia.

Methods: A rigorous, four-step process was used:

1. Forward translation. Two accredited, professional translators who were native speakers (one with and one without familiarity with medical terminology) produced independent forward translations of the English version of the CCCQ-P into the target language.
2. Synthesis of forward translations. The study team, two forward translators and a third accredited translator with experience in the health care system discussed all differences in interpretation and word choice to produce a single, synthesised forward translation.
3. Back translation. The forward translated version was back translated into English independently by two new translators who were blinded to the original English version of the CCCQ-P questionnaire.
4. Comparison with original CCCQ-P. The English back translations were reviewed by the translators and study team and any divergences from the concepts of the original questionnaire were resolved in the final translated version.

Pilot testing of the translated questionnaires is underway to assess patients’ views of the meaning of the questions and to assess the distributions of responses.

Results: There were only minor differences in interpretation and translation between forward translators across the three language groups. Back translated versions demonstrated no substantive departures from the concepts of the English questionnaire.

Conclusion: The availability of the CCCQ-P instrument in Simplified and Traditional Chinese and Arabic will enable assessment of cancer care coordination experiences to be assessed in these patient groups and will facilitate their inclusion in future research.

Consumer Involvement in Research (CIR) - Does it work? An Evaluation of Cancer Voices’ CIR Program

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Aims: Our evaluation study, after 10 years of Cancer Voices’ Consumer Involvement in Research (CIR) Program’s operation, was designed to assess, evaluate and analyse the views of both researchers who have used the service, and of consumers who are matched to work with them. As background data, we also sought to identify those major cancer research funders which require firm evidence of consumer involvement and/or include consumers on grant review panels.

Background: The CIR Program was developed by Cancer Voices to enable informed consumer involvement in cancer research. Trained consumers are matched with requesting researchers, and also participate on Grant Review Panels. Some funders make the former role a requirement for grant funding.

Methods:
A questionnaire was developed by Cancer Voices’ CIR Group to elicit answers to five questions about experiences, views, and recommendations. The questions were delivered by Survey Monkey in April 2016, with three email reminders and an over 60% positive response rate. The questionnaire was sent to all six major cancer research funders, who were contacted for information about their required degree of specific consumer involvement.

Results:
Analysis of survey responses showed the views of both researchers and consumers regarding how valuable they thought the interaction was, how it may have influenced the study, what barriers to successful interaction were encountered, how adequate was the training, and what extra help either party might need. Suggestions to fine tune the process and its value were noted. The six cancer research funders’ requirements, or lack of them, were collated.

Conclusions:
Evaluation of this innovative service of providing informed consumer input to researchers seeking it, is timely; as is a parallel survey of the consumer engagement requirements of the cancer research funders.

The outcomes of both investigations are being used to shape future interaction, to fine-tune the existing CIR process and to encourage all cancer research funders to understand its value and to formally apply the now well accepted principle of consumer involvement in research.

Moving Ahead - A group program for women who have completed treatment for breast cancer

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Monash Health’s Breast Care Unit first started a Moving Ahead Program in 2002 and continues today in 2016. It is well recognized in literature the benefits that survivorship programs have on cancer survivors. We offer our program twice a year for eligible women by aiming to provide a supportive environment to share experiences, address ongoing issues, increase knowledge of community supports and promote Shared Care with the GP- to transition patients to a wellness model. The groups are co facilitated with a Breast Care Nurse and Unit Social Worker. The program runs for 4 or 6 weeks (2 hours per week) and topics include Reflections on diagnosis and treatment, Personal reactions, Communication, Self-Care and Wellbeing and Community supports. An informal group setting provides a safe forum to address issues that have resulted from being diagnosed with breast cancer that may include fears, sadness, anxiety, ongoing physical concerns, family and relationship changes and to help provide strategies to assist participants. These concerns such as “…fears, sadness and loneliness that survivors experience, the disparity in perception between the survivor and their family, ongoing physical issues, changes in identity, role function and relationship changes…” (1) are also common themes identified in the group. The poster will outline the process involved in facilitating the program, including background, group structure, session topics, why women attend, demographics and outcomes.

Unplanned Admissions to a Medical Oncology Unit at a Tertiary Hospital – an Analysis of Emergency Presentations

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Purpose
Patients with solid organ malignancies often require unplanned admission via the emergency department (ED), despite efforts to minimise unintended complications of their disease and treatment. We analysed patterns of unplanned admissions via ED over a 6 month period at our tertiary level facility in order to review practice and inform service provision.

Methods
We performed a retrospective analysis of all unplanned medical and radiation oncology admissions via ED over a six month period at our institution. Clinical and demographic details, including time and reason for admission, tumour type, oncological treatment and involvement with palliative care services, were collected from the Emergency Department Information System (EDIS) and electronic medical records. Descriptive and comparative statistics were performed.

Results
Between May and November 2015, 445 patients were admitted to Cancer Care Services via the ED. Of these, 260 had solid organ malignancies and were admitted under oncology. Most admissions (66%) occurred after hours. Breast cancer was the most represented solid tumour (14.6%), followed by colorectal (13.1%), head and neck (12.7%) and lung (12.7%). The most common reason for admission was non-neutropenic fevers (19%); followed by uncontrolled pain (17.3%), nausea/vomiting (9.6%) and neutropenic fevers (7.3%). Most patients (86%) were undergoing active treatment, with 68.5% receiving cytotoxic chemotherapy, immunotherapy or targeted therapy. Mean time from last treatment till presentation was 13 days. Approximately one-quarter (26.5%) of admissions were treatment related; the majority however, were driven by disease-related symptoms/complications (59%). Most patients (74%) were being managed with non-curative intent; of these, 67.5% were known to palliative care.

Conclusion
Our review has demonstrated unplanned admission data similar to published literature, with some exceptions that will be explored in subsequent analysis. Most ED admissions occurred after hours and although most patients were receiving active treatment, majority of presentations were not directly related to this.
A Comparison of daily versus intermittent consultant medical oncology ward round: Does daily consultant ward rounds improve length of stay and early discharges?

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**Background**
There is an increasing evidence that daily consultant ward rounds improve length of stay. As a result, there is pressure from administration to implement daily consultant ward rounds. The evidence is strong for acute medical units however there is limited evidence in medical specialties including medical oncology. We assessed the length of stay and rate of early discharges in 2 ward rounds models, a daily consultant ward round versus an intermittent ward round, during the same period of time.

**Patients and Methods**
Inpatients from Fiona Stanley Hospital from February 2015 to October 2015 were reviewed. Patients who were initially admitted to non-oncological units were excluded. 184 episodes of care were identified in the daily ward round team while 174 episodes of care were identified in the intermittent ward round team.

**Results**
The average length of stay was 7.2 days for the daily consultant ward round team and 7.8 days for the intermittent ward round team. There was a difference of 0.6 days which was not statistically significant (p=0.5479). Total amount of patients discharged before 12pm was 31 for the daily consultant ward round team and 32 from the intermittent ward round team which was not statistically significant (p=0.3187).

**Conclusion**
Daily consultant ward rounds did not impact length of stay or early discharges. Other processes may need to explored to improve efficiencies in inpatient medical oncology services.

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Partnering with a local community health organisation to provide rehabilitation to cancer survivors

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**BACKGROUND**
It is internationally recognised that exercise programs are beneficial for cancer survivors and should be integrated into the cancer care pathway. However, for patients residing in the Western region of Melbourne, there are currently no health service specific cancer rehabilitation programs available. Western Health (WH) partnered with Djerriwarrh Health Services (DjHS) to pilot a rehabilitation program at Melton Health (MH).

**METHODS**
Two separate breast and prostate specific rehabilitation programs, of one hour education and one hour exercise, twice a week for six weeks was developed. The education programs were designed following close consultation with consumers. Exclusion criteria included: all other tumour streams, patients receiving active radiotherapy and/or chemotherapy and unable to independently participate in a group setting either due to physical or cognitive limitations.

**RESULTS**
Two breast and one prostate cancer rehabilitation groups were piloted at MH. A total of 39 patients were referred, with each group enrolling 5-8 patients. Of those referred, reasons for non-enrolment included not feeling ready to exercise, not feeling well enough or already returned to pre-morbid level of functioning. Breast and prostate cancer participants completed an average of eight and seven sessions respectively over the course of six weeks. All participants reported the program to be beneficial and provided them with self-management strategies. Participants also reported a change in attitude towards exercise and valued the social element that the program provided.

**CONCLUSION**
An effective partnership was developed between a tertiary and community health service to establish a cancer specific rehabilitation program that was feasible and acceptable for patients with breast or prostate cancer. The breast cancer rehabilitation group is now embedded as part of the exercise rehabilitation program at MH. A men’s cancer exercise group is currently being developed in response to the outcomes from the pilot prostate cancer group.

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Commencement of a supervised exercise program for women undergoing treatment for breast cancer and impact on current physiotherapy service provision.

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International guidelines recommend 30 minutes of daily exercise, and twice weekly resistance training for people with cancer.(1) However, total physical activity levels in women with breast cancer are significantly reduced throughout the first year post-operatively (2), and only 15% of women will meet recommended exercise guidelines at the time of completion of adjuvant therapy (2). With the opening of Gold Coast University Hospital (GCUH) in 2013, and growth of allied health cancer services in 2014, a cancer exercise group was developed at GCUH to provide weekly, supervised exercise for women with breast cancer undergoing, or having recently completed treatment. Participants are identified to the group through the outpatient physiotherapy service which sees all women with breast cancer post-operatively, or via consultant referral. An individual initial exercise assessment is completed with the physiotherapist prior to group attendance to review patient history, precautions and patient goals, and develop an individualised exercise program. Sessions run for one hour per week in the gym at GCUH, and consist of a warm-up, circuit of
individualised cardiovascular, resistance and flexibility exercises and cool-down, completed under supervision of the physiotherapist and physiotherapy assistant. Participants attend the group weekly for 8-12 sessions and complete independent exercise between sessions. At the time of discharge, post-group measures are completed and advice to maintain physical activity is provided. Standardised resources were developed to support the group, but allow for variability between participants. The group commenced in November 2015, and expanded to a second group in March 2016. While individual physiotherapy demand continued to grow on average 4.4% per month, since the introduction of the second group in March attendance has continued to increase by 30% per month, and an average of 4 people attend each session. Further analysis is planned with quantitative efficacy and feasibility studies to follow.


Diagnosis, Management and Outcomes of Four Major Cancer Types in a Regional Victorian Health Service

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2. Hume Regional Integrated Cancer Service, Shepparton, Victoria, Australia

Background
Almost one third of Australian population live outside major metropolitan areas. Current evidence suggests that cancer patients in rural and regional present with more advanced disease, have poorer outcomes, and shorter survival compared to their metropolitan counterparts. We propose a retrospective study to assess patient demographics, time to cancer diagnosis, treatment and survival outcomes in patients with breast, prostate, colorectal and lung cancers at Goulburn Valley Health in the last ten years.

Materials and Methods
The study will be conducted in accordance with Ethical Guidelines for Biomedical Research Involving Human Subjects after approval from Goulburn Valley Health’s Human Research Ethics Committee. Patients aged over 18 years who were referred, diagnosed or received treatment at Goulburn Valley Health for breast, prostate, colorectal and lung cancers from 1st of January 2006 to 31st of December 2015 will be included in the study. Information collected will include patient demographics, time from referral to oncology appointment/diagnosis/treatment, time from surgery to adjuvant chemotherapy, rates of chemotherapy administration and median overall survival. This data will be compared to the available data from one major Victorian metropolitan integrated cancer service and the Optimal Care Pathways by Cancer Council Victoria. Factors influencing the management and outcomes will be explored in further detail.

Results & Expected Outcomes
Data collection and analysis are currently in progress. The aim of this retrospective research is to explore current patient outcomes in a regional Victorian Centre. This research also aims to identify the shortfalls and to suggest possible solutions to improve cancer services in regional Victoria.


Measuring and improving cancer patients self-efficacy in understanding and using their prescription medication

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Aims: To test the feasibility of the Medication Use Self-Efficacy (MUSE) Scale in clinical practice including its ability to identify patients with low medication understanding. Method: Inpatients and day ward patients taking at least 1 regular medication were asked to complete the MUSE Scale. Patients requiring formal interpreter services and those who didn’t manage their medications were excluded. Pharmacists indicated agreement with MUSE ratings based on assessment of medication understanding during medication history interview. A risk-adapted approach to medication counselling was implemented to target education requirements for patients with poor medication understanding. Patients were surveyed post-discharge on experiences of pharmacists consultation and asked to confirm their understanding of new medications. Results: Eleven patients were recruited, mean age 61 years (range 37-78), 54% male and 54% listed high school as highest level of education. Patients were taking a median of 6 medications (range 2-14) on admission and 11 medications (range 1-16) on discharge. An average of 5.3 minutes (SD 4.3, range 1-15) was taken to complete the MUSE. Mean scores across all MUSE items indicated good medication understanding, and good level of agreement with pharmacists. Participants rated pharmacists explanation of medicines as mean of 8.4 (SD 1.6) out of 10, with 91% of patients agreeing that the explanation was clear enough. All participants indicated strong preference for written information. 60% of patients were able to provide all details of the new medications given on discharge. Conclusion: This feasibility study demonstrated usability of the MUSE in clinical practice. Wider
implementation will provide better understanding of the MUSE in identifying patients with low medication understanding. The implementation of guidelines on medication education which incorporate health literacy principles will assist in improving the high quality education provided by pharmacists.

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**Malnutrition risk in head and neck cancer patients at diagnosis. Is it prevalent?**

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**Aims**

Patients with head and neck cancer have known high rates of malnutrition. Malnutrition in this population has significant adverse impacts on clinical, cost and patient centred outcomes. Malnutrition rates between 30-50% at diagnosis have been reported in the literature. Evidence based practice guidelines recommended malnutrition screening at diagnosis, using a validated tool such as the Malnutrition Screening Tool (MST), to identify those at nutritional risk. Routine malnutrition screening, performed by the dietitian, was implemented at the Gold Coast University Hospital (GCUH) Multidisciplinary Head and Neck Clinic in 2014. Patients who attend this clinic are seen by specialist physicians, dietitian, speech pathologist and cancer nurse prior to the clinic providing a recommendation for their care plan. This clinic is the largest of its kind south of Brisbane and north of Newcastle. The aim of this study was to determine the prevalence of malnutrition risk in patients attending this clinic.

**Methods**

MST score (total) was extracted from the electronic medical record of patients that attended the Multidisciplinary Head and Neck Clinic between May 2014 and August 2016.

**Results**

A total of 452 patients attended 49 multidisciplinary head and neck cancer clinics. Malnutrition risk as determined by the MST score was present in 12.4% of patients. A large volume of patients (N=383, 84.7%) were deemed not at malnutrition risk according to the MST score. Less than 3% of patients that attended clinic were unable to be screened.

**Conclusions**

The results demonstrate that the majority of patients who attended clinics were not at risk of malnutrition at this time point according to the MST. Despite this, the future high risk of malnutrition in patients receiving anti-cancer treatments (i.e. surgery, radiation, systemic therapies) to the head and neck is well established and dietitian referral is still warranted.


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**Development and evaluation of patient resources to explain screening for anxiety and depression in cancer care**

**Heather Shepherd, Karen Allison, Josephine Clayton, Afaf Girgis, Toni Lindsay, Frances Orr, Phyllis Butow, Melanie Price, Joanne Shaw**

**Aims:** The Anxiety and Depression Pathway Program (ADAPT) will facilitate the implementation of the Clinical Pathway for the screening, assessment and management of anxiety and depression in adult cancer patients. Patient information is required to explain routine screening for anxiety and depression, and a stepped model of care for patients with cancer. We developed and evaluated patient information that explains the importance and practicalities of routine screening for anxiety and depression.

**Methods:** The patient resources were developed in 3 stages:

1. Expert review of existing resources.
2. Drafting of new resources where existing resources were not available.
3. Consumer review by current cancer patients and cancer survivors using feedback forms (n=2), focus groups (n=11) or telephone interviews (n=8). The consumer review covered topics on acceptability of the information, how easy the information was to understand and their understanding of the process of screening after reading the resources.

**Results:** Expert review identified resources already in place about anxiety and depression, and these resources were included. New information developed in online format and as an A5 pamphlet included information about:

- Anxiety and depression in the context of cancer
- Routine screening, what it is and why it is important
- The clinical pathway for the screening, assessment and management of anxiety and depression in adult cancer patients
- Possible referral and health professional roles within the psycho-oncology team
Qualitative analysis has identified the following themes:

- Acceptance of psycho-social care as part of routine care
- Information about the screening questions, and timing of receiving this information
- Attitudes regarding health professional roles in conducting screening
- Type and frequency of psycho-social support offered to patients

**Conclusions:** These patient resources will improve patient understanding of routine screening for anxiety and depression, and may improve uptake of screening and referrals. Consumers value information that explains the screening process.

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**Meeting the unique information and support needs of Australians diagnosed with de novo metastatic breast cancer**

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"My biggest frustration was getting people to understand. People make an assumption that I had breast cancer a first time but I had no understanding about any of it, including the treatment or how I would cope." (Vanessa)

**Aim**

To ensure the needs of Australians diagnosed with de novo metastatic breast cancer (MBC) were addressed in Breast Cancer Network Australia’s (BCNA) flagship resource for people with metastatic disease, *Hope & Hurdles*.

**Method**

Telephone interviews were conducted with seven women from regional and metropolitan areas who had been diagnosed with de novo MBC. The discussion guide was based on themes extracted from previous online survey results and anecdotal evidence collected from BCNA members via telephone enquiries, face to face and online forums.

**Results**

While there was some overlap with the information and support needs of those diagnosed with MBC after a previous diagnosis of early breast cancer (EBC), those with de novo MBC had some unique needs. Women described having to cope with a rapid transition from an EBC diagnosis and curative intent, to one of incurable disease and progression stabilisation. They needed to upskill quickly in basic breast cancer knowledge in tandem with understanding their own particular diagnosis and treatment options. Depending on life experiences, they may have had little opportunity to develop coping skills around a life threatening illness and few skills in navigating a complex health system. Care coordination for this group was described as fragmented. Some expressed the difficulty of finding peer support groups specific to their diagnosis. While all women felt angry at such a devastating diagnosis, paradoxically years later others felt a strange sense of relief, and sometimes guilt, at not having experienced the constant fear of recurrence that women with EBC report.

**Conclusions**

Key findings have led to a tailored section being added to the third edition of *Hope & Hurdles*. This work has highlighted the importance of BCNA developing an advocacy agenda to raise awareness of this group of breast cancer patients with unique needs.

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**Prevalence of breast cancer-related lymphedema after participation in a multimodal exercise intervention including heavy resistance training**

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4. Department of Public Health, University of Copenhagen, Copenhagen, Zealand, Denmark

**Aims**

Studies have found resistance training to be a safe exercise modality among women at risk of developing breast cancer-related lymphedema. This is important as resistance training is associated with many physical, psychological and clinical benefits. However, our current knowledge is limited as trials have evaluated loads with low to moderate intensity despite exercise science literature finding additional benefits in muscle strength and bone density from resistance training with heavy loads. Thus, studies exploring the safety of heavy-load resistance training in this population are warranted. Methods This is a descriptive study. Women (n = 149) treated for breast cancer partook in a structured telephone interview. All had participated in “Body and Cancer”, a six week, nine hour weekly, multimodal exercise intervention for cancer patients during chemotherapy utilizing heavy-load resistance training between January 2010 and December 2011. The average follow-up time was 14 months (range 4-26). A clinical diagnosis of breast cancer-related lymphedema reported by the participant was the primary outcome. Results Breast cancer-related lymphedema was reported by 27.5% in the total population, and 44.4% in the sub-group with axillary node dissection. No statistically significant association between strength gains during the exercise intervention and the development of breast cancer-related lymphedema was observed, nor was self-reported participation in resistance training with heavy loads up to three months post-intervention. Conclusions These exploratory findings suggest no association between heavy resistance training during chemotherapy and the development of breast cancer-related lymphedema. However, randomized controlled trials should be performed to confirm this observation.
Evaluating the impact of a cancer council operated wig service for patients experiencing cancer related hair loss

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Introduction:
Hair loss has been well established as a distressing side effect of cancer treatment. Cancer Council Victoria (CCV) has operated a free wig service since November 2012 to support people experiencing hair loss, and while several Cancer Councils in Australia operate similar services, the impact of these programs has not been formally evaluated.

Aim:
To describe the population that has accessed the CCV wig service, to explore their experience of cancer related hair loss, and to evaluate the impact of this service.

Methods:
A retrospective audit of service records from November 2012 – August 2015 was conducted to establish a service user profile. Sub-analysis of records from January – August 2015 focused on topics discussed in nurse-led wig service consultations. In January – April 2016, 15 semi-structured phone interviews were conducted and analysed thematically to further explore the experience of service users.

Results:
Nurses documented discussing 55 separate topics in addition to hair loss with service users. Topics were categorised into overarching themes including: treatment (discussed in 46% of consultations); patient navigation/referral (25% consultations); and emotional support (23% of consultations). Interviewees described a wide variety of hair loss experiences that were mostly negative and in some cases traumatic. The most common reason for accessing the CCV wig service was a desire to retain a sense of normalcy despite a changed physical appearance. Most interviewees reported a high level of satisfaction with their wigs, and used them frequently. Two interviewees from CALD backgrounds reported that their wigs failed to meet their needs.

Conclusions:
This study demonstrates the value of CCV’s nurse-led wig service to patients experiencing hair loss. As this is the first formal evaluation of any wig service, these findings may also assist other state-based Cancer Councils who run or are looking to set up similar services in the future.

Barriers and Facilitators of exercise experienced by cancer survivors: A mixed methods systematic review

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Purpose:
Exercise has been shown to improve the health and well-being of people who have survived cancer. Yet, less than 40% of cancer survivors in Australia meet the recommended 150 minutes of moderate-intensity physical activity per week. Our objective was to systematically review the literature regarding barriers, facilitators and preferences for exercise for survivors of cancer.

Methods:
MEDLINE, EMBASE, CINAHL, PsychINFO and SCOPUS were searched for qualitative or quantitative articles addressing barriers, facilitators and preferences for exercise in cancer survivors. Quality assessment was performed by two independent reviewers using the Mixed Methods Appraisal Tool (1). Thomas and Harden’s method of thematic synthesis (2) was used to amalgamate qualitative data while descriptive statistics were used to collate quantitative data. Higher-order interpretive constructs were developed by combining like themes within qualitative and quantitative literature. Narrative synthesis was used to integrate evidence across studies.

Results:
Twenty-one studies were included, of which 9 were qualitative and 12 were quantitative. Fatigue was the most commonly reported barrier to initiating or maintaining exercise, followed by lack of time, and treatment-related physical barriers such as loss of physical strength and function. The most common facilitators of exercise were gaining a feeling of control over their health as well as managing emotions and mental wellbeing. Survivors indicated that they would prefer to receive face-to-face exercise counselling from an exercise specialist at a cancer centre, with the option of carrying out an exercise program at home. Overwhelmingly, the preferred method of exercise was walking. The study also highlighted a significant proportion of survivors receiving incorrect or insufficient information regarding exercise.

Conclusions:
A breadth of factors affects exercise participation for cancer survivors. The lack of useful information provided for survivors suggests the need for improved patient education as well as highlighting the need for exercise professionals working in multidisciplinary cancer settings.
A study into the safety, efficacy and tolerability of scalp cooling in patients receiving chemotherapy, through the reduction of chemotherapy induced alopecia.

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Background: Chemotherapy-induced alopecia is one of the most distressing side effects for patients. Scalp cooling is an effective method for preventing chemotherapy-induced alopecia, and is widely used in the UK and Europe. Aim: To determine the efficacy and tolerability of scalp cooling in patients with early breast cancer receiving chemotherapy at the Cabrini Brighton Day Oncology Service. A secondary aim was evaluate patient wellbeing and quality of life. Method: This was an open label non-randomised cohort study. A series of self-report questionnaires including, hair loss, quality of life measures, a demographic and registration questionnaire, and a range of questions about expectation, satisfaction and aspects of impact (post study questionnaire) of the scalp cooling procedure were administered at multiple time points. Results: A total of 34 patients completed the pre-trial evaluation - 24 patients went on to complete the scalp cooling trial - 5 patients discontinued due to intolerance - 5 patients decided not to commence the trial Self Reported Hair Loss Results: -12% had no hair loss - 23% had minimal hair loss - 65% had moderate hair loss There were no patients whom experienced total hair loss 100% patients that completed the trial were happy with the end result, describing being able to keep their hair, (even if only partially) as a great result. Side effects were minimal and all patients would recommend the trial to other patients. Conclusion: Results from the evaluation of the trial indicated a positive response, with excellent feedback from patients. As a result, scalp cooling has now become standard practice at both Cabrini Day Oncology units for all patients eligible to utilise this technology.

Work after cancer – a qualitative study of survivors and health care providers.

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Aim: Information and support regarding return to work (RTW) after cancer diagnosis are important unmet needs for cancer survivors, health professionals and employers. Disadvantaged communities are likely to be particularly vulnerable to loss of work after cancer as a result of limited employment options, more limited work skills and/or limited access to cancer care. The aim of this project was to gain perspectives of cancer survivors and health care providers regarding enablers, barriers and gaps in support for RTW after cancer. with a particular emphasis on disadvantaged communities.

Methods: Participants were purposively selected from regional and rural areas and urban areas of disadvantage. A semi-structured interview guide was used to guide conversations with survivors, GP’s, cancer care professionals either through focus groups (5 with GPs, 2 with cancer survivors, 1 with Aboriginal health workers, 1 with cancer care providers), or individual telephone interview (n=7). Data were coded, inductively, until consensus regarding the emergent themes was achieved among the 3 coders.

Results: Major themes (in italics) identified factors that impacted on work ability after cancer including work place support, availability of alternate/meritile employment and access to alternate financial support without the requirement to stop work. Participants felt that patients in rural areas were more vulnerable to difficulties with RTW due to smaller job marker and less support services available. Survivors and health care providers expressed difficulties navigating the system to seek support and felt that any improvements would require advocacy and system changes at the health care and employment policy level.

Conclusions: Work after cancer is a significant challenge for cancer survivors and their health care providers.

Chemotherapy Use at the End-of-Life in the Gold Coast Hospital and Health Service
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Background: There have now been several published studies and audits both in Australia and in other countries, looking at the rate of chemotherapy use in the last few weeks of life, the factors that influence this, and how this can be improved.¹ ² ³ ⁴ ⁵ ⁶ ⁷ This has increasingly become almost a surrogate marker of the level of quality care in this ever-growing patient population. Despite the undisputed and exciting advances in cancer treatments, those that continue until near the end of life has an undeniably adverse effect on the quality of life of many patients, in many aspects of their lives (psychological, financial, etc.).

Aims: To assess the rate of use of chemotherapy (cytotoxic and targeted treatments) in the last two and four weeks of life, in the Gold Coast Area Health District; to identify factors that play a role in the trend towards aggressive cancer treatment towards the end of life; and to assess the trends of referrals to palliative care in the District.

Methods: Mortality data available for the Gold Coast Area Health District for one year from 2012 to 2013 was analysed. A retrospective chart review on the deceased patients was performed by analysing the records on the Electronic Medical Record program, which is in use across all three public hospitals in the District (Gold Coast University, Robina and Carrara Hospitals). Further information was also obtained from CHARM, the chemotherapy prescribing program in use at the GCUH. Only patients diagnosed with solid tumours undergoing treatment with palliative intent were included.

The variables looked at include: gender, date of birth, date of cancer diagnosis, date of last dose of chemotherapy, date of death, tumour origin and histology, treatment regimen, when referred to palliative care, reason for ceasing cancer treatment, and performance status information (if available) at both pre- and post-cessation stages of cancer treatment.

(Results and Conclusion not yet available as the statistical analysis is still ongoing. These will be available for the COSA Annual Scientific Meeting in November 2016.)


Rib pain in the management of breast oedema and fibrosis

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Background
Breast oedema and fibrosis are common side effects reported by patients who have undergone radiation to their conserved breast. Massage is used to treat breast oedema and fibrosis, with most symptomatic patients encouraged to perform self-massage at least once per day. Additionally, compression of the breast using bandages, dense foam inserts, and/or support bras are recommended. Despite good intentions to reduce oedema and fibrosis, incorrect use of massage and compression can lead to costo-chondritis and rib pain.

Aims and methods
Case studies and management plans of patients reporting rib pain without metastatic disease during treatment of breast oedema and fibrosis will be reported. All patients underwent lymphoedema assessments as well as palpation examination of their bilateral costo-chondral joints, inferior ribs and rib angles under the radiation fields. Pain and discomfort on palpation, as well as shoulder and thoracic movements were recorded.

Results and discussion
Treatment of breast oedema and fibrosis can be effective when a combination of massage and compression is used. Patients who are overly firm in their self-massage of their breast, and/or use very firm compression pads/bandages, underwire and support bras can aggravate underlying pain and inflammation of ribs and cartilage in the radiation fields, especially in the first 12 months after radiation. Irritability of the rib cage can easily be assessed by palpation.

Conclusion
Rib pain can result from firm compression and pressure used to treat breast oedema and fibrosis. Physiotherapists may need to check patients’ self-massage regularly to ensure that it is of the appropriate pressure and frequency. Wire-free and seam-free bras may reduce friction, pressure and inflammation at the inferior and lateral ribs.

Predictors of psychological distress amongst outpatient chemotherapy patients: An analysis of depression, anxiety and stress using DASS-21

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**Purpose**

This study aimed to identify clinical, demographic and service-related predictors of psychological distress amongst outpatient chemotherapy patients, in order to more effectively screen for distress and provide additional support.

**Methods**

Data were obtained via survey and chart review of ambulatory chemotherapy patients at 3 tertiary hospitals in Perth, Western Australia. The DASS-21 was used to psychological distress. Regression analyses were used to assess the relationship between psychological distress and a range of patient demographic and treatment variables.

**Results**

Patients with a Karnofsky performance score ≤80 (p=0.001) and average waiting time >60 minutes (p=0.035) were at significantly increased risk of moderate-severe distress. Patients with a household income between $50-75,000 p.a. had a lower risk of distress (OR 0.74, 95% CI 0.01-0.66, p=0.02). In addition, patients with a household income >$100,000 p.a. had a lower risk of distress using the DASS-D subscale (OR 0.20, 95% CI 0.01-0.78, p=0.03). On sub-scale analysis, depression contributed more to overall distress than the anxiety or stress scores on the DASS-21.

**Conclusions**

We identified a Karnofsky score ≤80 as an identifier of patients at increased risk of psychological distress and likely to be in need of additional support. We also confirmed the psychological impact of service provision factors, such as long waiting times. A household income of $50-75,000 p.a. is protective against distress, relative to a baseline of <$25,000 p.a. The identification of these potentially modifiable predictors of distress will assist in the screening of patients and implementation of appropriate support services.

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**The supportive care needs of prostate cancer survivors and their partners – lessons for nurses**

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This study explored the supportive care needs of men and their partners at various stages of their prostate cancer journey, and the perceived understandings of both about the impact of cancer treatment on their lives and relationships.

**Methods**

A mixed method approach was used. This included four focus groups with prostate cancer survivors and their partners, three additional couple interviews, and an international web-based survey. Completed questionnaires were obtained from 193 men and 40 partners from Australia, New Zealand, the USA, UK, Ireland and South Africa.

**Results**

Nurses providing care for these men should take into account the stage of the man’s cancer journey and his personal circumstances. For example, men were most distressed on first diagnosis and on cancer recurrence, and men without partners had consistently higher distress levels than those with a partner. Although the men were often reluctant to disclose their emotional and physical needs, their partner was often willing talk about changes in their men’s lives. Thus wherever possible, nurses should include the man’s partner in discussions about supportive care. Finally, love, acceptance, intimacy, gratitude, spirituality and hope were all found to be important concepts in enabling prostate cancer survivor’s cope.

**Conclusions**

A comprehensive nursing assessment of men with prostate cancer should involve wives and partners wherever possible. Nurses should ask questions regarding relationships, intimacy and spiritual needs. Men without partners should be considered at higher risk of enduring distress. Wives and partners of men with prostate cancer are a powerful resource for nurses and health care providers and should be integral in the development of care pathways and the provision of supportive care for men challenged by prostate cancer.

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**Is bioimpedance spectroscopy the most effective way of screening for lymphoedema following breast cancer? A systematic review.**

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**Background**

Lymphoedema (LE) after treatment for breast cancer can drastically affect quality of life for survivors. Early detection and early intervention aims to increase patient quality of life and decrease symptoms, while also decreasing medical costs, via reduced complications and reduced need for long term health professional intervention. Multi Frequency Bioimpedence Spectroscopy Analysis (BIS) is a tool used for early detection to screen for LE in breast cancer patients pre and post axillary surgery.
Aim:

- Identify current methods used to screen for LE and summarise their measurement properties
- Consider optimal time points for LE screening
- Determine prevalence of LE following nodal surgery due to cancer.

Method

A systematic search was conducted of CINAHL, Embase and PubMed databases and other key sources using a pre-defined search strategy. Systematic screening and selection identified all relevant articles for inclusion and were critically appraised using a standardised tool. Key data and findings were extracted and tabulated from included articles and a critical, narrative synthesis was conducted.

Results

This systematic review found the prevalence of LE in this population of women following breast cancer treatment ranged from 4.4% to 38%. Additionally, it showed good levels of evidence for BIS to detect subclinical LE in patients following breast cancer treatment, finding its use could potentially lead to decreased incidence rates of clinical LE, decreased costs on the healthcare system, and increased patient quality of life. No standardised time points were identified amongst the papers for LE screening.

Conclusion

BIS has the ability to detect LE at subclinical levels with the potential to prevent development of secondary LE and the potential to decrease burden of cost on the health care system.

Association between communication about cancer care and psychological distress, patient’s symptom and interference with aspect of patient’s life.

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Aim:

This study aimed to investigate association between communication about cancer care (CCC) and 1) psychological distress, 2) patient’s symptoms, 3) interference with aspect of patient’s life, among cancer patients undergoing radiation therapy.

Methods:

Cancer patients aged 20 years or older were consecutively sampled when they started radiation therapy at two university hospitals in Japan. The patients were asked to complete self-administered questionnaires assessing psychological distress (Hospital Anxiety and Depression Scale: HADS) and patient’s symptom and interference with aspect of patient’s life (M.D. Anderson Symptom Inventory). CCC, ad-hoc self-administered questionnaire contained following items: if medical staff asked you about symptoms at more than half of my appointments, if medical staff asked you whether you wanted to receive the treatment, if a staff member asked whether your appointments were scheduled at suitable days and times, if medical staff specifically asked you whether you had as much information as you wanted about what the treatment is, and how it is given, short and long term side effect.

Results:

Two hundred and fifty-one patients returned their questionnaire. (Response rate: 65%) The mean (SD) and median age of the study population was 63.4(12) and 66 years, respectively. A multiple regression analysis revealed that CCC (whether you wanted to receive the treatment) was significantly associated with psychological distress (HADS >10), fatigue, dry mouth and interference with general activity, mood, relationship with others, walking ability and enjoyment of life. CCC (long term side effect) was significantly associated with psychological distress (HADS >10). CCC (short term side effect) was significantly associated with walking ability.

Conclusions:

Medical staff needs to check patient’s intention to cancer treatment to reduce psychological distress and interference with daily life.

A Partnership Providing Sustainable Health Care and Support: The Specialist Cancer Nurse and Expert Peer Support

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Much has been researched and written about the values of specialist cancer nursing and peer support and of the roles they play in the supportive care context. However, there are few examples of these roles melding in an equal partnership.
Whilst Survivorship Centres are now emerging in the cancer domain, The Wesley Hospital Choices Cancer Support Centre (Choices) has provided a unique blend of support to people affected by breast and gynaecological cancers regarding their emotional, social, and intellectual needs since 1998. Choices has been innovative in the implementation of services both in the Australian and global contexts with its development based on and reflecting the philosophy of providing a therapeutic environment respecting the needs of patients and supporters. This understanding now extends to people affected by all cancers.

Whilst clinical support and appropriate information are essential, so is the benefit of sharing the lived experience when provided in an empathetic and experienced manner. One of the strengths of Choices which distinguishes it from other programs is its strong commitment to the value of expert peer support as part of the clinical team and deliberate strategies have been implemented acknowledging this. Choices employs a specialist cancer nurse as manager alongside a team of registered nurses, allied health professionals, complementary therapists, and the peer support coordinator who has a personal cancer experience plus clinical knowledge and understanding and who work together in the development of services. Its success exists around this client focused partnership demonstrating a seamless natural blend of all aspects of care.

This partnership has enabled patient navigation and survivorship concerns to be more easily managed with support accessible throughout the cancer trajectory. There are no time limits, enabling support to be accessed and provided from diagnosis to end of life.

### Changes in household income levels after a cancer diagnosis and treatment: Initial results from a pilot study at a single cancer centre.

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**Introduction**

Improvements in cancer diagnosis and treatment have resulted in substantial growth in the costs of cancer care1. Changes in a patient’s household income as a result of a cancer diagnosis or its treatment, in combination with the out-of-pocket costs of care, can place a significant financial burden on patients and their families2.

**Methods**

The study is a prospective observational pilot study among adults treated with anti-cancer therapy, in both the adjuvant and palliative settings, in an outpatient department of a tertiary cancer hospital in Sydney, Australia.

We have prospectively collected data from 14 patients currently receiving treatment for their cancer in the outpatient setting at one cancer centre thus far. Participants completed a questionnaire comprising four sections relating to socio-demographic characteristics, employment/income history, health insurance status and cancer-related treatment.

The data presented here has been collected as part of a larger pilot study investigating the out-of-pocket costs of cancer care for patients at three Australian cancer centres.

**Results**

Preliminary results for 14 participants: The median age in our cohort was 57 years (range: 37 – 77). The most common cancer type was breast (n=7), followed by prostate (n=2), lung (n=2), renal cell carcinoma (n=1) and gastroesophageal (n=1). 10 patients described a reduction in their household income after the diagnosis of cancer and 4 patients reported no change in their household income level. 12 patients (n=7), followed by prostate (n=2), lung (n=2), renal cell carcinoma (n=1) and gastroesophageal (n=1), 10 patients described a reduction in their household income after the diagnosis of cancer and 4 patients reported no change in their household income level. 12 patients were working part-time or full-time in paid work prior to the diagnosis of cancer, of which 10 described changes in their work conditions, most commonly decreased work hours (6), ceased working (3) and retired (1).

We aim to continue recruitment of participants at a further two sites, which will allow for a more heterogeneous population from different socioeconomic backgrounds.

**Discussion**

These preliminary findings are informative and may be indicative towards the changes in household income status as a result of a diagnosis of cancer and its treatment. Further results from the ongoing study will help to inform us regarding the magnitude and significance of these changes.


### ASCOLT: Aspirin for Dukes B and High Risk Dukes C Colorectal Cancers

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Efficacy of scalp cooling and pharmacokinetics at the Kinghorn Cancer Centre, St Vincent's Hospital

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Background
Chemotherapy induced alopecia (CIA) is a distressing side effect of chemotherapy. Scalp cooling prevents hair loss by causing vasoconstriction and reducing exposure of cytotoxic agents to hair follicles. It is hypothesized that slower metabolism and higher peak concentrations of chemotherapy result in less effective scalp cooling.

Aim
Our study aims to assess the effect of scalp cooling at the Kinghorn Cancer Centre. This will include its efficacy in preventing hair loss, impact on quality of life, and the relationship between the peak plasma concentration of chemotherapy drugs and response to scalp cooling.

Methods
We will collect prospective data on thirty women with early breast cancer receiving scalp cooling with a Paxman Scalp Cooling device from June 2016 until January 2017. To measure degree of hair loss, we have built into our MOSAIQ database the Dean's scale for hair loss and the NCI CTCAE scale. A nurse will assess and take photographs of hair cover and record data in MOSAIQ. Quality of life will be measured by the Chemotherapy induced Alopecia Distress Scale (CADS). Patients fill out this questionnaire at each cycle and 3 months post completion of chemotherapy. In collaboration with the Clinical Pharmacology Department, we will conduct a feasibility study involving blood collection from patients having scalp cooling to measure peak plasma concentration of chemotherapy drugs docetaxel and cyclophosphamide, and the relationship to the degree of hair loss with scalp cooling.

Conclusion
Data generated from this study is important for quality assurance to ensure our rates of scalp cooling are consistent with published data. We aim to link data collected prospectively in MOSAIQ with an international collaboration developing a new quality of life data tool that will be available in the next 12 months. Understanding the relationship between peak chemotherapy concentration and the effectiveness of scalp cooling may help individualise scalp cooling, such as determining post-infusion cooling times.

Aims: Systemic anti-cancer therapy (SACT) use in the last month of life is an important performance indicator for centres providing care for patients with cancer. We aim to determine outcomes at a regional Queensland cancer centre to allow benchmarking against Australian and international data.

Methods: A retrospective audit was undertaken at Toowoomba Hospital (Darling Downs Regional Cancer Centre) to analyze mortality occurring within 30 days of SACT (cytotoxic chemotherapy, targeted therapy) for solid tumour and haematological malignancies from January 2011 to December 2015. Factors evaluated included age, sex, diagnosis, aim of treatment, chemosensitivity of disease, type and number of treatments, distance from treatment facility, palliative care involvement, place and cause of death.

Results: A study cohort of 219 patients was identified as having received SACT within 90 days of death during the 5 year study period, 66 of these (30.1%) were treated within 30 days of death. Evaluation of electronically stored chemotherapy data and a review of patient medical records is underway to identify factors influencing decisions to treat. Yearly rates as percentage of all patients treated with SACT within 30 days of death (2.45, 4.43, 4.11, 3.09, 3.89) are similar to that reported from a similar regional facility in Victoria. Over the 5 years this rate is 5.4%. Of all deceased patients that received SACT, 13.7% were treated within 30 days of death. Further results will be reported at the meeting.

Conclusion: Preliminary analysis indicates that our results appear comparable to available literature data. Increased research into this important indicator, and the factors influencing treatment decisions, can only serve to facilitate improvements in this area of care.