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Australian behavioural research in cancer



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Geriatric oncology

GERIATRIC ONCOLOGY: CURRENT STATE OF THE SCIENCE

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Since *Cancer Forum* first focused on geriatric oncology in 2008, our understanding of the needs of this growing population has expanded, along with the evidence base to support and optimise the level and quality of cancer care provided to older Australians. With the leadership of groups such as the International Society of Geriatric Oncology (SIOG) and the Cancer and Aging Research Group, there has been a steady increase in the awareness of the needs of older people with cancer globally. Within Australia, the Clinical Oncology Society of Australia's Geriatric Oncology Interest Group is fostering the development of the field in a truly multidisciplinary fashion. Input from all disciplines engaging in cancer care is required to facilitate the necessary development in research, education and service delivery.

This forum brings together expertise from a wide range of clinical specialties and disciplines. It provides an overview of the challenges of providing cancer care to an older, heterogeneous population with variable physiological functioning, rates of comorbidity and needs, and identifies opportunities to further refine their cancer care for this cohort. Rather than inventing new services, many of these articles detail strategies for utilising the expertise within existing cancer, primary or aged care services to provide appropriate care and support to older people with cancer.

In 2011, SIOG developed a document highlighting the main priorities for education, clinical practice and research in geriatric oncology around the globe.¹ This included a call for the development of specific geriatric oncology training programs. Gaining dual certification in geriatrics and medical oncology or palliative care remains an arduous process, and only a small group of physicians have attained the title of geriatric oncologist.² While it is unrealistic to suggest that a dual-trained clinician will manage all older adults with cancer, these specialists will be able to drive academic geriatric oncology programs that other centres can learn from. The development of a streamlined dual-training program will be required to expedite this process. In the meantime, much of the routine care of older adults with cancer will fall on clinicians in oncology clinics, who

will need to harness the expertise of existing oncology and geriatric multidisciplinary teams to address the unmet needs of this population. As the number of older people with cancer and some degree of cognitive impairment is predicted to increase in line with population ageing, the article by Soo is a reminder of the importance and complexity of assessing cognition on clinical decision making in this population.³ This article calls for early identification to facilitate appropriate decision-making and interventions to reduce the effects of cognitive impairment on patients and their caregivers. It provides clinicians with insights into the various cognitive screening methods and cognitive impairment management strategies, and the action required. If a clinician suspects a patient may have cognitive impairment, a more detailed assessment is required. This is one area where collaboration with a geriatrician and/or aged care assessment team is vital.

Ideally, geriatric screening and assessment ought to be available for older people with cancer at the point of entry. However, determining which screening and geriatric assessment tool is most appropriate continues to be a contested space. The article by McCarthy et al details a two-step pragmatic screening and assessment approach that is being tested in a large metropolitan cancer centre in Australia, and provides insights as to what might be realistically possible using existing resources.⁴ While the search for the 'best' assessment tool is ongoing, these authors remind us that identifying the best method of assessment is often a complex process that needs to be tailored to the needs of the patients and the clinical context.

Determining optimal treatment regimens for older adults with cancer is also challenging, as fewer older people are included in clinical trials and current data of geriatric assessment variables fails to resolve the specific difficulties involved in determining if a patient is fit enough to receive chemotherapy. In the absence of robust clinical trial data, empirical age-related dose reductions are frequent in clinical practice. Gibbs and colleagues examine the literature relating to chemotherapy outcomes for the

treatment of colorectal cancer in older adults and make some suggestions about which group of older people appear to benefit from chemotherapy for this disease.⁵ Although we do have some data regarding the efficacy and toxicity of this treatment in older adults, more research is needed to advance evidence-based clinical decision making in this area.

Not surprisingly, studies that inform clinicians of the optimal management of frail patients are one of the priority research areas. The amount of dedicated geriatric oncology research is increasing worldwide, yet there is much work yet to be done. Determining the effect of a geriatric assessment and guided intervention, the best screening and assessment tools for clinical practice, and how to design clinical trials specifically for older adults with cancer are some of the key research questions yet to be answered. Our international colleagues, Mohile and Hurria, provide a framework detailing the geriatric-oncology research priorities for current investigators in the field.⁶

Given the prevalence of comorbid conditions in ageing populations and the enduring relationship many older people have with their general practitioner (GP), Mitchell's article details the importance of primary care input throughout the cancer journey.⁷ While it can be difficult to engage primary care clinicians in day-to-day cancer management, there are key situations where the role of the GP is paramount. The GP is a vital member of the multidisciplinary management team, however finding ways to improve their participation in the decision making process is challenging. Technological advances such as video conferencing via Skype into multi-disciplinary meetings will hopefully improve this situation.

Nurses and allied health professionals have a significant role to play in identifying and proactively addressing the unmet needs of older people and their care-givers, which is explored in the article by Prouse and Phillips.⁸ They suggest a range of practical strategies that could be readily implemented by all cancer care services as the first step to addressing the practical and emotional needs of older people with cancer. They also pay attention to the supportive care needs of the care-givers, who themselves are also often older and frequently have their own health concerns. In addition to this contribution, the perspective of the pharmacist and dietician are provided in separate papers by Lees and Findlay et al.^{9,10}

Being aware of the prescribed and over the counter medications being used by older people takes on increasing importance when cancer treatment is required. Lees provides an overview of the poly-pharmacy issues and details four steps to enable cancer care clinicians to effectively manage and identify potential drug-drug interactions. Findlay calls for routine screening to identify older people at risk of malnutrition, using validated tools, and suggests practical strategies for the multidisciplinary team to adopt to ensure that those at risk of malnutrition have timely access to nutritional support from a dietician. These articles reinforce the importance of input from specialist members of the multidisciplinary team.

As Mitchell notes, the management of cancer in older adults should be "...similar but different" to the care of younger patients. Adequate geriatric assessment is required to guide appropriate treatment. The principle of geriatric oncology is to individualise management to provide the appropriate level of treatment and supportive care that the older person and their carer requires. This can be a difficult and time consuming process, however as all of the articles in this issue demonstrate, with dedication, rigour and teamwork, we can work together to optimise the patient's treatment and ensure that their cancer care journey and that of their care-givers is as smooth as possible.

References

1. Extermann M, Aapro M, Audisio R, Balducci L, Droz J-P, Steer C, et al. Main priorities for the development of geriatric oncology: a worldwide expert perspective. *J Geriatr Oncol.* 2011. 2:270-273
2. Khattak MA. Training opportunities in geriatric oncology. *Asia Pac J Clin Oncol.* 2011. 7:401-2.
3. Soo W. Older adults with cancer and clinical decision making: the importance of assessing cognition. *Cancer Forum.* 2013;37(3)201-205
4. McCarthy AL, Berry R, Stone LM, Walpole E, Thomson DB, Bedford M, et al. The Princess Alexandra Hospital model of comprehensive geriatric assessment of cancer patients: Methodological and practical aspects. *Cancer Forum.* 2013;37(3)206-210
5. Maddison C, Wong H, Gibbs P. Chemotherapy in older adults with colorectal cancer. *Cancer Forum.* 2013;37(3)210-215
6. Mohile S, Dale W, Magnuson A, Kamath N, Hurria A. Research priorities in geriatric oncology for 2013 and beyond. *Cancer Forum.* 2013;37(2) 216-221
7. Mitchell GK. The role of primary care in better supporting older people with cancer. *Cancer Forum.* 2013;37(3)222-225
8. Prouse J, Phillips J. Care of older people living with cancer: the role of the specialist nurse and allied health professionals. *Cancer Forum.* 2013;37(2)226-229
9. Lees J. Management of polypharmacy in older cancer patients. *Cancer Forum.* 2013;37(3)230-233
10. Findlay M, Bauer J, Clarke S, Isenring E. Understanding nutritional issues in the older person with cancer. *Cancer Forum.* 2013;37(3)234-237

OLDER ADULTS WITH CANCER AND CLINICAL DECISION-MAKING: THE IMPORTANCE OF ASSESSING COGNITION

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Abstract

Cognitive impairment presents unique clinical challenges in the management of older adults with cancer. With an ageing population, the recognition and management of cognitive impairment is likely to become more important in oncology practice. Currently, screening for cognitive impairment is not routinely performed in oncology. However, screening has been shown to detect cognitive deficits in a significant proportion of older adults with cancer. This can have a significant impact on treatment decisions, including determining suitability for cancer therapy and capacity to provide informed consent. In addition, cognitive impairment can enhance the risk of complications from cancer and its treatment. Early identification can facilitate appropriate decision-making and interventions to minimise its consequences. Further research is needed on recognition and management of cognitive impairment in older adults with cancer. This article provides an overview of cognitive impairment in older adults with cancer, with the aim of informing clinicians on the importance of assessing cognition.

The incidence of both cancer and cognitive impairment increases with age.¹⁻³ With population ageing occurring globally, clinicians are more likely to encounter older adults with both cancer and cognitive impairment. In developed countries, more than 60% of all cancers are diagnosed in persons aged 65 years and older.^{4,5} In low and middle income countries, the percentage of cancers diagnosed in people aged 65 and older is lower, but population ageing is progressing fastest.⁶ Almost one in 10 persons aged 65 years and older, and three in 10 of those aged 85 years and older have dementia.⁷ Currently, screening for cognitive impairment is not routinely performed in most oncology centres. However, several studies examining cognition as part of a comprehensive geriatric assessment demonstrate that between 24% and 38% of older adults with cancer have cognitive deficits.⁸⁻¹³

Identifying these individuals is important, as cognitive impairment is associated with significant clinical consequences, including increased emergency department visits, treatment-related complications, morbidity and mortality.¹⁴⁻¹⁶ In cancer patients, the presence of cognitive impairment poses unique clinical challenges and can influence treatment decisions. Cognitive deficits can impact on the patient's decision-making capacity, adherence to treatment and ability to seek help if problems arise. Identifying individuals with cognitive impairment allows for more informed decision-making and implementation of measures to minimise its consequences. However, despite its potential importance, cognitive impairment remains significantly under-recognised in cancer patients. This review aims to summarise the syndromes of cognitive impairment and evaluation of patients with this condition. It describes the implications of cognitive impairment on clinical

decision-making capacity and treatment decisions, and discusses strategies to minimise its impact on older adults with cancer.

Defining cognitive impairment

Cognitive impairment describes a syndrome of impaired brain function related to the ability to think, concentrate, formulate ideas, reason and remember. Cognitive impairment can be broadly divided into three groups: delirium, mild cognitive impairment and dementia.

Delirium is a medical condition characterised by disturbance of attention, disorientation and altered cognition (eg. memory, orientation, language). The disturbance develops over a short period of time (usually hours to days) and tends to have a fluctuating course. Delirium is a direct physiological consequence of physical disease, brain injury or drug effect.

Mild cognitive impairment (classified as mild neurocognitive disorder in diagnostic and statistical manual of mental disorders (DSM-5)) is a term used when there is significant cognitive decline that exceeds normal ageing, but not sufficient to cause significant functional impairment. Cognitive impairment is considered to be a transitional state between normal ageing and early dementia. It is important to recognise mild cognitive impairment because it is a risk factor for developing early dementia. Depending on clinical setting and definition, between 30% and 50% of individuals with mild cognitive impairment progress to dementia over 10 years.¹⁹

Dementia is a syndrome of memory impairment and at least one other cognitive deficit (eg. aphasia, apraxia, agnosia or executive dysfunction) that is sufficient to cause significant functional impairment and represents a decline

from previous functioning.¹⁷ Dementia usually has a slow, progressive course (over months to years). Alzheimer's disease is the most common cause of dementia but there are numerous other known causes such as vascular dementia, Lewy body dementia and frontotemporal dementia.

Mood disorders such as depression can also be associated with cognitive deficits. Because delirium, dementia and depression can present with overlapping features and often co-exist in older adults with cancer, careful clinical evaluation is essential (table 1).

Cancer can affect cognition through direct effects on the brain such as brain metastases or indirectly through complications such as organ failure, electrolyte imbalance, malnutrition. In addition, cancer therapy can also exacerbate cognitive deterioration through adverse effects such as infection, dehydration, electrolyte imbalance, hormonal dysregulation. Important variables known to influence the risk of cognitive side-effects include: type, dose, duration and combination chemotherapy; brain radiotherapy; advanced age; and cognitive function prior to treatment.²¹ In addition, symptoms such as fatigue, anxiety and depression can negatively influence cognitive

Table 1: Key features of delirium, mild cognitive impairment, dementia and depression.

	Delirium	Mild cognitive impairment	Dementia	Depression
Key clinical features	1. Acute onset and fluctuating course 2. Inattention 3. Disorganised thinking or altered consciousness	1. Cognitive impairment 2. No functional impairment	1. Memory impairment 2. Other cognitive deficits 3. Functional impairment	1. Low mood 2. Loss of interest or pleasure
Attention	Impaired	Generally intact	Generally intact	Generally intact
Onset	Hours to days	Months to years	Months to years	Weeks to months
Response to treatment	Usually reversible with treatment of underlying cause	May progress to dementia	Usually irreversible and progressive	Usually reversible with treatment

Causes of cognitive impairment

Older adults with cancer are particularly vulnerable to developing cognitive impairment. The cause is often multifactorial (table 2). The ageing process is associated with physiological changes in the nervous system, including altered neurotransmitter function, decreased cerebral blood flow, reduction in nerve conduction and decreased sensory perception.²⁰ In addition, pathological changes due to neurodegenerative diseases and vascular ischaemia contribute to cognitive decline and development of dementia. The overall reduction in cognitive reserve predisposes older adults to developing cognitive dysfunction from cancer or its therapy.

performance. Cancer patients also typically receive multiple medications for co-morbid conditions or as part of cancer therapy. This can increase the risk of cognitive impairment, especially with the use of opioids, corticosteroids and benzodiazepines.²²

Apart from acute cognitive changes that commonly occur during cancer therapy, there is growing evidence that some individuals experience long-term cognitive deficits following cancer therapy. The risk of dementia is increased in long-term cancer survivors aged 65 years and older compared with their cancer-free twins, suggesting that cancer and its treatment increases the risk of long-term cognitive dysfunction.²³ Several studies show that cognitive

Table 2: Risk factors for delirium in older cancer patients.

Non-modifiable risk factors	Potentially modifiable risk factors
Older age	Acute illness
Pre-existing cognitive impairment	Surgery
Medical comorbidities	Radiotherapy (especially to the brain)
Advanced cancer	Chemotherapy: type, dose, duration, combination chemotherapy
Brain metastases	Infection
	Electrolyte imbalance
	Dehydration
	Sensory impairment: • Vision impairment • Hearing impairment
	Medication: polypharmacy psychoactive medications: • Opioids • Benzodiazepines • Corticosteroids • Anticholinergics • Neuroleptics

impairment can occur in cancer survivors following brain radiotherapy and chemotherapy.^{24,25} The evidence for chemotherapy-induced cognitive impairment is greatest in breast cancer patients, where numerous studies suggest that 20-40% of patients demonstrate cognitive deficits in post-treatment evaluation.²⁶⁻²⁸ Recognising cognitive impairment and its risk factors is important, as it allows for strategies to be implemented to reduce their clinical consequences.

Cognitive screening

Because of the potential impact of cognitive impairment on treatment decisions and tolerance of treatment, clinicians should consider cognitive screening in older adults with cancer. Many cognitively impaired individuals compensate for their deficits and can appear cognitively intact on routine evaluation, hence the use of a standardised screening instrument is recommended.

Of the many screening instruments available, the Mini-Mental State Examination (MMSE) is one of the most commonly used instruments for assessing cognitive function.²⁹ The MMSE can be used to screen for dementia, track changes in cognitive function over time and assess the effects of therapeutic agents on cognition.³⁰ It consists of 11 items designed to assess five areas of cognitive function: orientation; registration; calculation and attention; recall; and language. The MMSE is fairly lengthy and takes 10 minutes to administer, with a sensitivity of 71-92% and specificity of 56-96% for detecting dementia.^{31,32} Limitations of the MMSE include poor sensitivity to frontal lobe dysfunction and its influence by age, education level and culture.³³⁻³⁵ This can lead to failure to detect dementia in well-educated people and low scores in patients with language barriers, poor education, depression and anxiety, or who are feeling unwell at time of assessment.

Newer cognitive screening instruments, such as the Rowland Universal Dementia Assessment Scale (RUDAS) and the Montreal Cognitive Assessment (MoCA), are gaining more widespread use. In patients of non-English speaking background, the RUDAS should be utilised as it is designed to minimise the effects of cultural learning and language diversity.^{36,37} However, when mild cognitive impairment is suspected, the MoCA should be performed as it has been shown to be superior to the MMSE in detection mild cognitive impairment.³⁸⁻⁴⁰

In a busy clinical practice, a more rapid screening test may be desirable. The Clock Drawing Test (CDT) and Mini-Cognitive Assessment (Mini-Cog) are simple and quick screening instruments for gross abnormalities of cognition.⁴¹⁻⁴³ CDT, when combined with three-item recall, forms the Mini-Cog. These tests takes less than three minutes to administer and compare well against other longer cognitive screening instruments. Abnormal findings on initial brief screening should trigger more detailed assessment.

When cognitive impairment has developed rapidly, delirium should be suspected. Use of a validated instrument such as the Confusion Assessment Method or the Memorial Delirium Assessment Scale can assist with screening, diagnosis and monitoring severity of delirium.^{44,45} The presence of delirium should prompt urgent assessment

and treatment of the underlying cause and concurrent management of symptoms of delirium.⁴⁶ Drugs and infection are the most common causes of delirium in the elderly. In most patients, delirium improves over time if the underlying cause is treated. Aggressive supportive care with appropriate non-pharmacological and pharmacological interventions should be instated until the patient recovers.

Depression can present as cognitive impairment ('pseudodementia'), hence older adults with cancer who experience cognitive impairment should also be screened for depressive symptoms with a standardised screening instrument such as the Hospital Anxiety and Depression Scale or the Geriatric Depression Scale.^{47,48} The presence of depression warrants prompt intervention and treatment, which may include counselling, cognitive behavioural therapy, antidepressant therapy or referral to specialised psychiatry services.

It is important to emphasise that the diagnosis of cognitive impairment should not be based solely on abnormal cognitive screen results. Screening tests should be used to complement clinical judgement in assessing a patient's cognition. If cognitive screen was abnormal, clinicians should obtain a structured history from the patient and an informant, perform a physical examination and mental state assessment, review medications and perform blood investigations for medical conditions that may contribute to cognitive impairment including vitamin B12, folate, thyroid function and calcium levels (table 3). Neuro-imaging such as CT or MRI, may be indicated if there is focal neurology to exclude structural brain lesions, such as brain metastasis, subdural haemorrhage and stroke. If diagnosis is uncertain, cognitive impairment persists, or cognition continues to deteriorate, patients should be referred to a memory clinic for specialist evaluation and detailed neuropsychological testing. The role of the memory clinic is to provide expert clinical diagnosis, information on appropriate treatments, education, support and direction in future planning. As various types of dementia have different treatment options and rate of progression, accurate diagnosis is important to determine appropriate management and future planning.

Table 3: Conditions to exclude.

Depression and anxiety
Nutritional deficiencies: thiamine, B12, folate
Hypothyroidism
Electrolyte imbalance <ul style="list-style-type: none"> hyponatraemia hypercalcaemia
Structural brain lesions <ul style="list-style-type: none"> brain metastasis intracranial haemorrhage stroke
Infection

Cognitive impairment and decision-making capacity

Decision-making capacity is an important issue to consider in cancer patients with cognitive impairment, especially when cancer therapy often involves complex treatment decisions. The presence of cognitive impairment does not necessarily mean a lack of decision-making capacity, but further careful evaluation is required. To have decision-making capacity, an individual must be able to understand relevant information, appreciate the situation and its consequences, reason about treatment options and communicate a choice.⁴⁹ If all these criteria are true, a person is capable of making a decision, even if that person has cognitive impairment. It is also possible for a person to lack capacity to make a specific decision, but not about another.

A person with cognitive impairment should be supported in making decisions for themselves where possible. Helpful strategies include involving close family members in decisions, repeating key points, using simple language, asking targeted questions and obtaining verbal feedback about their understanding. If the person is still unable to make an informed decision, then medical decisions can be made by a substitute decision-maker, which is usually a close family member, unless prior arrangements such as a medical power of attorney or advance directives have been made. In cancer patients, capacity can change rapidly due to complications from cancer or its treatment. Therefore, early on while the patient still has capacity, it is important to discuss issues such as the goals of care, treatment preference, advance directives and enduring power of attorney.

Cognitive impairment and treatment decisions

While the presence of cognitive impairment should not dictate treatment decisions, it is an important factor that needs to be considered. Cognitive impairment can shift the overall risk-benefit ratio of cancer treatment through its effects on life expectancy, morbidity, tolerance of therapy and adherence to treatment plan. The degree of impact of cognitive impairment depends on its severity and rate of progression. Individuals with mild cognitive impairment may not progress to dementia and may remain suitable to receive life-sustaining treatment.¹⁹ By contrast, individuals with moderate-to-severe cognitive impairment (MMSE<17) can have a five year mortality equivalent to the diagnosis of cancer.⁵⁰ Estimating the trajectory of cognitive decline and overall life expectancy may contribute to planning for patients and families. Knowledge that dementia is a progressive, incurable disease with high morbidity and significant caregiver burden, or that certain treatments can exacerbate cognitive deterioration exemplified by brain radiotherapy and increase the level of care, could influence the patient's preference for cancer treatment. Discussions with patients should take into consideration the patient's priorities, prognosis and risk-benefit assessment of the intervention. Interventions should be tailored to maximise the effective dose and minimise toxicity in older cancer patients.

Management strategies

Recognising cognitive impairment early allows clinicians to anticipate problems and implement preventative measures.

Cognitive impairment increases the risk of delirium during hospitalisation. Prevention strategies such as reorientation, sleep enhancement, early mobilisation, vision optimisation, hearing optimisation and early correction of dehydration can significantly reduce the risk of delirium in hospitalised patients.⁵¹ In community patients undergoing chemotherapy, cognitive impairment may impact on the ability to recognise symptoms of toxicity or seek prompt medical attention. Proper education and social support can ameliorate some of these risks. Cognitive impairment should be taken into consideration when prescribing medications. Strategies to improve medication adherence should be considered, such as tailored medication information, systems to organise medications or enlisting social supports to monitor adherence or administer medications. Medications should be reviewed and inappropriate medications discontinued. Oral chemotherapy should be avoided if adherence is unreliable. Cognitive impairment can affect the patient's ability to compensate for functional decline, perhaps indicated by poor mobility or psychosocial issues which are more common in elderly patients undergoing cancer therapy. Cognitive impairment also places significantly increased demands on caregivers and may limit the ability of families to support a patient through a complex treatment regimen. A comprehensive multidisciplinary approach to support patients and facilitate access to services can reduce some of the impact of cognitive impairment.

There is currently no established treatment for cognitive impairment due to chemotherapy or radiotherapy. Possible reversible causes, such as anaemia, vitamin deficiencies, endocrine dysfunction, metabolic abnormalities and medication side-effects should be addressed. Improvement of fatigue, pain and mood are also likely to improve cognitive performance. Cognitive and behavioural treatment strategies may also be employed, focusing on compensatory strategy training, stress management, energy conservation and psychoeducation.²¹ There is growing evidence that cognitive training through crosswords, Sudoku or the like, regular exercise, social engagement and good nutrition may correlate with improved cognitive performance.⁵² There are no known risks associated with using these non-pharmacological interventions, however the current evidence is insufficient to recommend them routinely in older adults with cancer.

Conclusion

The number of older adults with both cancer and cognitive impairment is predicted to increase due to an ageing population. The challenge faced by clinicians will be to identify and manage patients with these co-existing problems. Early identification can facilitate appropriate decision-making and interventions to reduce the effects of cognitive impairment on patients and their caregivers. Clinicians should be aware of methods of cognitive screening, availability of specialist diagnostic clinics and management strategies for cognitive impairment. Finally, further research is required to determine the optimal way to identify cognitive impairment in older cancer patients, to understand the relationship between cancer therapy and cognitive impairment, and to develop treatment options and preventative strategies to minimise the impact of cognitive impairment.

References

- Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. GLOBOCAN 2008 v2.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 10 [Internet]. Lyon: International Agency for Research on Cancer; 2010 [cited: 2012 Dec 1]. Available from: <http://globocan.iarc.fr>
- Jorm AF, Jolley D. The incidence of dementia: a meta-analysis. *Neurology*. 1998;51(3):728-33.
- Corrada MM, Brookmeyer R, Berlau D, Paganini-Hill A, Kawas CH. Prevalence of dementia after age 90: results from the 90+ study. *Neurology*. 2008;71(5):337-43.
- Yancik R, Ries LA. Aging and cancer in America: Demographic and epidemiologic perspectives. *Hematol Oncol Clin North Am*. 2010;14:17-23
- Cancer Research UK. Incidence 2009 – UK. London: Cancer Research UK; 2012.
- United Nations. Ageing in the Twenty-First Century: A Celebration and A Challenge. New York: United Nations Population Fund; 2012.
- Australian Institute of Health and Welfare. Dementia in Australia. Canberra: AIHW; 2012.
- Repetto L, Fratino L, Audisio RA, Venturino A, Gianni W, Vercelli M et al. Comprehensive geriatric assessment adds information to Eastern Cooperative Oncology Group performance status in elderly cancer patients: an Italian Group for Geriatric Oncology Study. *J Clin Oncol*. 2002;20(2):494-502.
- Extermann M, Hurria H. Comprehensive Geriatric Assessment for Older Patients With Cancer. *J Clin Oncol*. 2007;25(14):1824-1831.
- Caillet P, Canoui-Poitrine F, Vouriot J, Berle M, Reinald N, Krypciak S et al. Comprehensive geriatric assessment in the decision-making process in elderly patients with cancer: ELCAPA study. *J Clin Oncol*. 2011;29(27):3636-42.
- Puts MT, Monette J, Girre V, Pepe C, Monette M, Assouline S, et al. Are frailty markers useful for predicting treatment toxicity and mortality in older newly diagnosed cancer patients? Results from a prospective pilot study. *Crit Rev Oncol Hematol*. 2011;78(2):138-49.
- Kanesvaran R, Li H, Koo KN, Poon D. Analysis of prognostic factors of comprehensive geriatric assessment and development of a clinical scoring system in elderly Asian patients with cancer. *J Clin Oncol*. 2011;29(27):3620-7.
- Molina-Garrido MJ, Guillén-Ponce C. Development of a cancer-specific Comprehensive Geriatric Assessment in a University Hospital in Spain. *Crit Rev Oncol Hematol*. 2011;77(2):148-61.
- Puts MT, Monette J, Girre V, Wolfson C, Monette M, Batist G, et al. Does frailty predict hospitalization, emergency department visits, and visits to the general practitioner in older newly-diagnosed cancer patients? Results of a prospective pilot study. *Crit Rev Oncol Hematol*. 2010;76(2):142-51.
- Puts MT, Hardt J, Monette J, Girre V, Springall E, Alibhai SM. Use of geriatric assessment for older adults in the oncology setting: a systematic review. *J Natl Cancer Inst*. 2012;104(15):1133-63.
- Robb C, Boulware D, Overcash J, Extermann M. Patterns of care and survival in cancer patients with cognitive impairment. *Crit Rev Oncol Hematol*. 2010;74(3):218-24.
- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders . 5th ed. Washington, DC; 2013.
- Winblad B, Palmer K, Kivipelto M, Jelic V, Fratiglioni L, Wahlund LO, et al. Mild cognitive impairment-- beyond controversies, towards a consensus: report of the International Working Group on Mild Cognitive Impairment. *J Intern Med*. 2004;256(3):240-6.
- Mitchell AJ, Shiri-Feshki M. Rate of progression of mild cognitive impairment to dementia--meta-analysis of 41 robust inception cohort studies. *Acta Psychiatr Scand*. 2009;119(4):252-65.
- Ropper AH, Samuel MA. The neurology of ageing. In: Ropper AH, Samuel MA, editors. Adams and Victor's principles of neurology. 9th ed. New York: McGraw-Hill; 2009. 580-587.
- Dietrich J, Monje M, Wefel J, Meyers C. Clinical patterns and biological correlates of cognitive dysfunction associated with cancer therapy. *Oncologist*. 2008;13(12):1285-95.
- Gaudreau JD, Gagnon P, Harel F, Roy MA, Tremblay A. Psychoactive medications and risk of delirium in hospitalized cancer patients. *J Clin Oncol*. 2005;23(27):6712-8.
- Heflin LH, Meyerowitz BE, Hall P, Lichtenstein P, Johansson B, Pdersen NL, et al. Cancer as a Risk Factor for Long-Term Cognitive Deficits and Dementia. *J Natl Cancer Inst*. 2005;97(11):854-6.
- DeAngelis LM, Delattre JY, Posner JB. Radiation-induced dementia in patients cured of brain metastases. *Neurology*. 1989;39(6):789-96.
- Vardy J, Tannock I. Cognitive function after chemotherapy in adults with solid tumours. *Crit Rev Oncol Hematol*. 2007;63(3):183-202.
- Wefel JS, Saleeba AK, Buzdar AU, Meyers CA. Acute and late onset cognitive dysfunction associated with chemotherapy in women with breast cancer. *Cancer*. 2010;116(14):3348-56
- Koppelmans V, Breteyer MM, Boogerd W, Seynaeve C, Gundy C, Schagen SB. Neuropsychological performance in survivors of breast cancer more than 20 years after adjuvant chemotherapy. *J Clin Oncol*. 2012;30(10):1080-6.
- Ahles TA, Saykin AJ, McDonald BC, Li Y, Furstenberg CT, Hanscom BS, et al. Longitudinal assessment of cognitive changes associated with adjuvant treatment for breast cancer: impact of age and cognitive reserve. *J Clin Oncol*. 2010 ;28(29):4434-40.
- Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*. 1975;12(3):189-198.
- Strauss E, Sherman EMS, Spreen O. A Compendium of Neuropsychological Tests: Administration, norms, and commentary. 3rd ed Oxford University Press; Oxford: 2006.
- Molloy DW, Standish TI. A guide to the standardized Mini-Mental State Examination. *Int Psychogeriatr*. 1997;9 Suppl 1:87-94; discussion 143-50.
- Boustani M, Petersen B, Hanson L, Harris R, Lohr KN. Screening for dementia in primary care: a summary of evidence for the US Preventive Services Task Force. *Ann Int Med* 2003;38:927-37.
- Slachevsky A, Villalpando JM, Sarazin M, Hahn-Barma V, Pillon B, Dubois B. Frontal assessment battery and differential diagnosis of frontotemporal dementia and Alzheimer disease. *Arch Neurol*. 2004;61(7):1104-1107.
- Bravo G, Hébert R. Age- and education-specific reference values for the Mini-Mental and modified Mini- Mental State Examinations derived from a non-demented elderly population. *Int J Geriatr Psychiatry*. 1997;12(10):1008-18.
- Sczufca M, Almeida OP, Vallada HP, Tasse WA, Menezes PR. Limitations of the Mini-Mental State Examination for screening dementia in a community with low socioeconomic status: results from the Sao Paulo Ageing & Health Study. *Eur Arch Psychiatry Clin Neurosci*. 2009;259(1):8-15.
- Storey JE, Rowland JT, Basic D, Conforti DA, Dickson HG. The Rowland Universal Dementia Assessment Scale (RUDAS): a multicultural cognitive assessment scale. *Int Psychogeriatr*. 2004;16(1):13-31.
- Rowland JT, Basic D, Storey JE, Conforti DA. The Rowland Universal Dementia Assessment Scale (RUDAS) and the Folstein MMSE in a multicultural cohort of elderly persons. *Int Psychogeriatr*. 2006;18(1):111-20.
- Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I et al. J Am Geriatr Soc. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. 2005;53(4):695-9.
- Dong Y, Lee WY, Basri NA, Collinson SL, Merchant RA, Venketasubramanian N, et al. The Montreal Cognitive Assessment is superior to the Mini-Mental State Examination in detecting patients at higher risk of dementia. *Int Psychogeriatr*. 2012;24(11):1749-55.
- Markwick A, Zamboni G, de Jager CA. Profiles of cognitive subtest impairment in the Montreal Cognitive Assessment (MoCA) in a research cohort with normal Mini-Mental State Examination (MMSE) scores. *J Clin Exp Neuropsychol*. 2012;34(7):750-7.
- Borson S, Brush M, Gil E, Scanlan J, Vitaliano P, Chen J, et al. The Clock Drawing Test: utility for dementia detection in multiethnic elders. *J Gerontol A Biol Sci Med Sci*. 1999;54(11):M534-40.
- Borson S, Scanlan J, Brush M, Vitaliano P, Dokmak A. The mini-cog: a cognitive 'vital signs' measure for dementia screening in multi-lingual elderly. *Int J Geriatr Psychiatry*. 2000;15(11):1021-7.
- Ketelaars L, Pottel L, Lycke M, Goethals L, Ghekiere V, Santy L, et al. Use of the Freund Clock Drawing Test within the Mini-Cog as a screening tool for cognitive impairment in elderly patients with or without cancer. *J Geriatr Oncol*. 2012;4(2):174-182.
- Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegel AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. *Ann Intern Med*. 1990;113:941-8
- Breitbart W, Rosenfeld B, Roth A, Smith MJ, Cohen K, Passik S. The Memorial Delirium Assessment Scale. *J Pain Symptom Manage*. 1997;13(3):128-37.
- Breitbart W, Alici Y. Evidence-based treatment of delirium in patients with cancer. *J Clin Oncol*. 2012;30(11):1206-14.
- Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67(6):361-70.
- Brink TL, Yesavage JA, Lum O, Heersma P, Adey MB, Rose TL. Screening tests for geriatric depression. *Clinical Gerontologist*. 1982;1:37-44.
- Appelbaum PS. Assessment of Patients' Competence to Consent to Treatment. *N Engl J Med*. 2007;357(18):1834-40.
- Nguyen HT, Black SA, Ray LA, Espino DV, Markides KS. Cognitive impairment and mortality in older Mexican Americans. *J Am Geriatr Soc* 2003;51(2):178-83.
- Inouye SK, Bogardus ST Jr, Charpentier PA, Leo-Summers L, Acampora D, Holford TR, Cooney LM Jr. A multicomponent intervention to prevent delirium in hospitalized older patients. *N Engl J Med*. 1999;340(9):669-76.
- Williams KN, Kemper S. Interventions to reduce cognitive decline in aging. *J Psychosoc Nurs Ment Health Serv*. 2010;48(5):42-51.

PRINCESS ALEXANDRA HOSPITAL MODEL OF COMPREHENSIVE GERIATRIC ASSESSMENT OF CANCER PATIENTS: METHODOLOGICAL AND PRACTICAL ASPECTS

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Abstract

There is increasing momentum in oncology to implement a two stage assessment process that accurately determines the ability of older patients to cope with, and benefit from, chemotherapy for cancer. The two-step approach aims to ensure that patients clearly fit for chemotherapy can be accurately identified and referred for treatment without undergoing a time and resource intensive Comprehensive Geriatric Assessment. Ideally, a two-step process removes the uncertainty of how to classify and then appropriately treat the older cancer patient. After trialing a two-stage screen and Comprehensive Geriatric Assessment process in the Division of Cancer Services at Princess Alexandra Hospital in 2011-12, a model of oncogeriatric care was implemented based on the findings. In this paper, the methodological and practical aspects of implementing the Princess Alexandra Hospital model are explored and further work needed to refine the process is outlined.

A scan of the oncogeriatric research literature reveals a wide variety of tools used for screening. Common approaches range from gross functional assessments such as the Karnofsky Performance Index, to more detailed functional assessment by way of the Barthel Index or the Lawton Activities of Daily Living Scale. Geriatric-specific assessment using the Geriatric-8 and Vulnerable Elders Survey-13 (VES-13) is also common, designed to capture the wider range of variables that affect function and the subjective variables likely to influence outcomes in older patients. There are also cancer-specific screening tools, such as the abbreviated Comprehensive Geriatric Assessment, that elicit a range of variables thought specific to gerioncology.¹

Irrespective of the method chosen, the screen should be sufficiently sensitive to ensure that older patients deemed suitable for systemic treatment are actually fit to proceed to treatment. The screen should also have sufficient specificity to ensure that the time consuming process of the second stage – a Comprehensive Geriatric Assessment (CGA) for those judged more vulnerable on screening – is actually necessary.² Given the diversity of tools recommended in the literature however, the composition of the screening tool is clearly open to interpretation. In the authors experience, it is not possible to standardise screening across sites, as the patient variables that must be assessed are highly specific to the setting in which they occur. The treatment context, which is a major metropolitan referral centre servicing one third of Queensland, has sociodemographic challenges in terms of health literacy, language differences, social deprivation and degree of rurality. These greatly

influence the treatment outcomes, but might not have the same impact in other settings. A robust screen is one that provides a careful appraisal of variables, with the potential to affect treatment outcomes in a given situation.

VES-13 is perhaps the most popular screening tool, and the one trialed in this study after appraising the evidence.³ In non-cancer settings, VES-13 is commonly used to quickly evaluate patients' functional abilities and deficits, their self-reported health status and their chronological age. The VES-13 then grossly categorises older people into the categories of 'fit' for treatment, or 'vulnerable' to treatment and in need of further comprehensive assessment. While not cancer-specific, VES-13 is recommended in oncology settings to quickly differentiate individuals fit for standard chemotherapy from those who may benefit from a more thorough assessment and possible therapy modification.⁴

The data from the study (under review) revealed that while it had potential, VES-13 alone was not sufficient to meet clinical needs.⁵ The conclusions were supported by a paper published just after the preliminary data analysis was completed. Hamaker et al's systematic review of the seven most common geriatric screening tools – including VES-13 – concluded that irrespective of their value in other geriatric settings, none of these tools had sufficient discriminative power in cancer settings to recommend their use.² Pooled data in this meta-analysis indicated that VES-13 had a sensitivity of 68% and specificity of 78% in predicting patient outcomes.² Despite their limitations, Hamaker et al concluded that screening tools did have the potential for modification and enhanced rigour in cancer care.² If

this can be achieved, the value of screening in terms of rationalising resources and referring only those patients potentially vulnerable to treatment for a comprehensive assessment is significant.⁴

As a result of the study, a composite screen has been implemented. It includes VES-13, which is supplemented with tools that elicit other important contextual patient variables commonly encountered in service, such as malnutrition risk, body mass index, level of distress and health-related quality of life (table 1). The validity and reliability of this composite screener in future studies will be rigorously evaluated.

Which CGA tools?

A CGA comprising a suite of validated tools is designed to determine fitness for treatment in older people after potential vulnerabilities are identified through screening.⁴ CGA was developed in community and rehabilitation aged care settings to thoroughly assess health problems amenable to correction. In these settings it has demonstrated robustness in identifying older people's health risks, and for improving their health outcomes by linking them to appropriate interventions.⁶ More recently, it has translated well to selected acute care settings.⁷

CGA generally comprises a full medical and social history, followed by a battery of scales that assess the physical, psychological, cognitive and functional domains of health in older patients. While there is consensus in the literature that these domains should be evaluated, as with screening tools there is less agreement as to precisely how this should be undertaken. Irrespective of its composition, a CGA in cancer settings should ensure that: those individuals who are amenable to intensive chemotherapy (after their deficits are identified and remedied) are appropriately treated; that vulnerable patients more suited to modified or supportive regimens are determined; and that frail individuals who would benefit most from palliative regimens, or no treatment at all, are also identified and offered the appropriate level of care.^{8,9}

Hence, it is vital that comorbidities are assessed, because pre-existing illnesses affect recovery from cancer treatment and are also correlated with cancer treatment efficacy.¹⁰ In the study that informed this model, the gold standard Cumulative Index Rating Scale-Geriatrics (CIRS-G) to elicit comorbidities was used.¹¹ In the course of the study however, it was found that while the CIRS-G was indeed methodologically robust, it was logistically cumbersome to build into the model of oncogeriatric assessment that the context demanded. For this reason, the current version of the model uses the Charlson Comorbidity Index – an equally rigorous tool in the cancer context, but one hopefully more useable in practice.

In the psychosocial domain, a CGA should elicit the cognitive and affective status of older patients, which are also believed to contribute to cancer treatment outcomes.^{8,10} These variables were assessed in this study with the Standardised Mini-Mental State Examination (SMMSE) and the Geriatric Depression Scale (GDS), both of which proved problematic. The GDS, for example, while a widely-accepted component of CGA in non-cancer settings, is not well-validated in oncology-specific

contexts.¹² It was also not clinically acceptable, in that its fixed yes/no response set was difficult to deal with in this socially-sensitive situation, when patients had been newly diagnosed. It was also realised that the equal weighting of items in the GDS might be misleading in patients, who were often reasonably and reactively distressed by their new diagnosis, as opposed to endogenously depressed over the longer term.¹³ In addition, it is likely that the SMMSE and GDS do not reliably measure the fitness potential of patients with low levels of education, those from different ethnic backgrounds, and those whose first language is not English. Tests such as the SMMSE and the GDS are culture-specific, reflecting Western cultural values and expectations about cognitive capacity and emotional function. These values do not necessarily translate to all patients in the culturally-diverse treatment context,¹⁴ which serves large immigrant Chinese, Burmese, Pacific Islander and refugee African communities. Hence, the assessment could produce false results for those patients.¹⁵ So even though the SMMSE is used for the present, it is recognised that it is a rather blunt instrument in certain situations. The evidence has also been further appraised and the CES Depression Scale in the model of oncogeriatric care has been tested and evaluated.

A range of factors such as fiscal pressures, staff expertise and availability, patient demographics, and organisational resources and commitment influences the choice of tools, how they are used and how the data they produce are interpreted in a given context. In Australia, for example, local factors resulted in the development of quite different CGA approaches in South Australia and New South Wales to the model tailored to the Queensland situation.^{16,17} Table 1 outlines the full suite of tools in the current Princess Alexandra Hospital model.

In addition to these, the study data indicated that the assessment should summarise past and present medical history, including all medications to elicit potential problems related to polypharmacy, investigate continence and gather information about material and social support structures in the patient's home environment.

Logistical issues

In addition to the methodological tensions described above, logistical issues must be considered when implementing an oncogeriatric model of care in a fiscally-challenging climate. Good assessment of elderly cancer patients is not only complex, it is time-consuming. A CGA can take up to two hours to complete, not including the time taken to then review the data, call in a geriatrician to consult on problematic areas and to formulate a plan for further management.^{8,26} The experiences during the trial emphasise that oncologists lack the time and resources to undertake these complex assessments. Furthermore, it is difficult to meet the needs of our rural patients, some of whom live up to 10 hours drive away. Using the available resources in a way that would not upset the equilibrium of existing people and processes within the service, a creative solution needed to be determined which would still meet the needs of clinicians and patients.

Issues that were flagged by the service as problematic were: the need to avoid replication of existing procedures; to clearly define the roles of personnel within the model

Table 1: PAH CGA suite

Tool	Variable measured	Rigour in cancer patients
Charlson Comorbidity Index	Number and severity of other morbidities.	Validated to predict patient outcomes. ¹⁸
Medical Outcomes Social Support Survey	Emotional, informational, tangible, affectionate and positive social interactions.	Internal consistency $\alpha > .90$; construct and convergent validity established. ¹⁹
Standardised Mini-mental State	Cognitive capacity.	Reliability $\alpha = 0.65-0.732$, ¹ sensitivity 91%; ²⁰ specificity 91%. ²⁰
CES Depression Scale	Depression.	Sensitivity 100%; ²¹ specificity 79% ²¹ PPV 92%; ²¹ internal consistency $\alpha = 0.90$. ²¹
Modified Barthel Index	Basic activities of daily living.	Criterion and construct validity established; ²² test- retest reliability $r = 0.7$, ²² inter-rater reliability $r = 0.99$. ²²
Lawton IADL Scale	Complex functional abilities.	Inter-rater reliability $r = 0.85$; ²³ reliability $\alpha = 0.86$. ²³
Timed Up and Go	Falls risk.	Test-retest reliability $r = 0.91-0.99$. ²⁴
Modified Carer Strain Index	Physical, psychological, social, financial and emotional responses to providing care.	$\alpha = 0.9$, test-retest reliability = 0.88. ²⁵

so that professional boundaries were clear; to establish efficient procedures for assessment and referral; and to ensure the assessment outcomes were meaningful for all the patients and health professionals concerned i.e. there had to be buy-in from all clinicians from all disciplines. The mechanism of delivery also needed to be scoped. Some CGA models for example, entail mailing surveys to the patient in a reply-paid envelope prior to their first clinic visit; others involve the patient entering their own data into a computer system while waiting for their oncologist appointment.²⁷ These delivery modes are driven by contextual needs and are successful for that reason. At Princess Alexandra Hospital however, the language and computer literacy of a significant proportion of patients required consideration. In addition, patients and clinicians in our study had clearly expressed a preference for face-to-face assessment.

To resolve these tensions, a CGA model wherein the CGA data are collected by a skilled nurse trained in oncogeriatric assessment, was developed. The CGA nurse personally interviews each patient prior to the first oncologist visit where possible, to administer the survey tools. Where a patient cannot attend personally, the screener plus any CGA tools that don't need to be administered face-to-face are administered by phone, with the rest of the data collected personally at the first clinic appointment. The CGA nurse then enters the data into the computerised oncology patient management system, along with a summary of the objective and subjective data. The summary is sent to the treating doctor and also made available to the tumour stream co-ordinators and relevant allied health personnel for multidisciplinary review to enable a collective treatment decision to be made. This model overcomes the logistic obstacle of overstretched health professional resources and is financially viable, given that

a dedicated nurse trained in this procedure is clearly more cost-effective than a two hour assessment undertaken by a time poor oncologist and a further geriatrician consult. It also ensures that treatment is truly multidisciplinary and is convenient to patient needs.

Next step: a computerised decision support system

The model will be subject to ongoing evaluation and refinement. The process must be made more efficient, and fiscal pressures permitting, this will be done by developing telehealth procedures for more remote patients, satellite clinics in outer urban referral services, and a computerised decision support system linked to all patients' assessments. Algorithms incorporated into computerised decision support systems are an effective way to simplify access to the often disparate data necessary to make decisions, reduce costs, integrate workflow and to alert clinicians when new or significant patterns in patient data arise, while maintaining a patient-centred focus on the individual who is the point of care.²⁸ As with any clinical practice however, it is vital that the computations underpinning the system can be tempered by judgments derived from clinical experience in specific populations.²⁹ To ensure clinical acceptability, it is also imperative that the methods used to develop the computerised algorithm, and the way the items within it are weighted, are open to external scrutiny so that their rigour can be verified, they can be improved if necessary and adapted to specific situations.²⁹ With respect to CGA, the InterRai Consortium has developed computerised decision-making algorithms for various settings, excluding cancer care. While the way InterRai developed the weightings underpinning the algorithms is not clear, the group reports that the algorithms achieve good outcomes in community, residential and other acute care settings.³⁰ In cancer care, Massa et al developed

an algorithm underpinning their CGA data but similarly, the method used to weight the components of the CGA and how they contribute to their algorithm was not explained. The work from here entails testing the screening and CGA data to determine the most accurate algorithm to guide care.

This work to date indicates the potential of the two stage assessment process to improve the care of older cancer patients, but not its actual ability to do so. It is clear that the process can identify problems within the older patient's domains of health that require further consideration and referral, and it certainly contributes to a holistic and multidisciplinary model of care. However, the predictive properties of screening and CGA are not truly understood at this stage.^{2,31,32} While it is an excellent mechanism for referral and for correction of deficits that can affect treatment, it is not known whether such a process can accurately identify older cancer patients' fitness or otherwise for chemotherapy, or guide appropriate therapeutic choices. It is also not known whether the data from CGA can be weighted to reliably inform a computerised algorithm to support clinical decision-making. However, given the personal, social and clinical consequences for older cancer patients of inappropriate or under-treatment, there is clearly a need to continue to robustly test context-specific oncogeriatric assessment processes like this in the Australian setting.

References

- Overcash JA, Beckstead J, Moody L, Extermann M, Cobb S. The abbreviated comprehensive geriatric assessment (aCGA) for use in the older cancer patient as a prescreen: Scoring and interpretation. *Critical Reviews in Oncology/Hematology*. 2006;59(3):205-210.
- Hamaker ME, Jonker MM, de Rooij SE, Vos AG, Smorenburg CH, van Munster BC. Frailty screening methods for predicting outcome of a comprehensive geriatric assessment in elderly patients with cancer: A systematic review. *Lancet Oncology*. 2012;13:437-444.
- National Comprehensive Cancer Network (NCCN). Senior Adult Oncology v.2.2007. NCCN Clinical Practice Guidelines in Oncology. 2007; http://www.nccn.org/professionals/physician_gls/PDF/senior.pdf. Accessed 23rd May, 2012.
- National Comprehensive Cancer Network (NCCN). Senior Adult Oncology v.2.2007. NCCN Clinical Practice Guidelines in Oncology 2007; http://www.nccn.org/professionals/physician_gls/PDF/senior.pdf. Accessed 4th August, 2008.
- Thomson D, McCarthy A, Yates P, Skerman H, Walpole E. Comparison of ratings of fitness for chemotherapy using Vulnerable Elders Survey-13 versus physician's judgments Annual meeting of the American Society of Clinical Oncology: Building Bridges to Conquer Cancer. McCormick Place, Chicago, Illinois, United States. : American Society of Clinical Oncology; 2013.
- Gray L, Wootton R. Comprehensive geriatric assessment 'online'. *Australasian Journal on Ageing*. 2008;27(4):205-208.
- Gray L, Bernabei R, Berg K, Finne-Soveri H, Fries BE, Hirdes JP, Arino-Blasco, S. Standardising assessment of elderly people in acute care: The interRAI Acute Care Instrument. *Journal of the American Geriatrics Society*. 2008;56:536-541.
- Singhal N, Rao AV. Tools for assessing elderly cancer patients. *Cancer Forum*. 2008;32(1):6-7.
- Massa E, Madeddu C, Astara G, Pisano M, Spiga C, Tanca FM. An attempt to correlate a "Multidimensional Geriatric Assessment" (MGA), treatment assignment and clinical outcome in elderly cancer patients: Results of a phase II open study. *Critical Reviews in Oncology Haematology*. 2008;66:75-83.
- Hurria A, Lachs MS, Cohen H, Muss H, Kornblith AB. Geriatric assessment for oncologists: Rationale and future directions. *Critical Reviews in Oncology and Haematology*. 2006;59:211-217.
- de Groot V, Beckerman H, Lankhorst GJ, Bouter LM. How to measure comorbidity: a critical review of available methods. *Journal of Clinical Epidemiology*. 2003;56(3):221-229.
- Nelson CJ, Cho C, Berk AR, Holland J, Roth AJ. Are Gold Standard Depression Measures Appropriate for Use in Geriatric Cancer Patients? A Systematic Evaluation of Self-Report Depression Instruments Used With Geriatric, Cancer, and Geriatric Cancer Samples. *Journal of Clinical Oncology*. January 10, 2010;28(2):348-356.
- Adams KB. Depression symptoms, depletion, or developmental change? Withdrawal, apathy, and lack of vigor in the Geriatric Depression Scale. *The Gerontologist*. 2001;41(6):768-777.
- Struhkamp R, Mol A, Swierstra T. Dealing with independence: Doctoring in physical rehabilitation practice. *Science, Technology and Human Values*. 2009;34(1):55-76.
- Brijnath B. Screening for dementia: Fluidity and the Mini Mental State Examination in India. *Transcultural Psychiatry*. 2011;48(5604-623).
- Steer CB, Chia PL, O'Connor J, Underhill C, Donnelly J, Myers R et al. Utilising existing community-based supportive care and aged care resources for older patients with cancer: Updated results of the Care Coordination in the Older Adult with Cancer (CCOAC) project. *Journal of Geriatric Oncology*. 2012;3(S1):S31.
- To THM, Okeru M, Prouse J, Prowse RJ, Singhal N. Infancy of an Australian geriatric oncology program: Characteristics of the first 200 participants. *Journal of Geriatric Oncology*. 2010;1(2):81-86.
- Koppie TM, Serio AM, Vickers AJ, Vora, K, Dalbagni G, Donat SM. Age-adjusted Charlson comorbidity score is associated with treatment decisions and clinical outcomes for patients undergoing radical cystectomy for bladder cancer. *Cancer*. 2008;112(11):384-2392.
- Sherbourne CD, Stewart AL. The MOS Social Support Survey. *Soc Sci Med*. 1991;32(6):705-714.
- Kai H, Hoi SF, Wong E, Lo R, Woo J. Do pain and disability differ in depressed cancer patients? *Palliative Medicine*. 2000;14(1):11-17.
- Hopko DR, Bell J L, Armento MEA, Robertson SMC, Hunt MK, Wolf NJ, et al. The Phenomenology and Screening of Clinical Depression in Cancer Patients. *Journal of Psychosocial Oncology*. 2007;26(1):31-51. Retrieved from http://dx.doi.org/10.1300/J077v26n01_03. doi:10.1300/J077v26n01_03
- Cohen ME, Marino RJ. The tools of disability outcomes research functional status measures. *Archives of Physical and Medical Rehabilitation*. 2000;81(Suppl. 2):S21-S29.
- Graf C. The Lawton Instrumental Activities of Daily Living (IADL) Scale. *Annals of Long-Term Care*. 2007;15(7):21-22.
- Rydwik E, Bergland A, Forsen L, Frandin K. Psychometric properties of Timed Up and Go in elderly people: a systematic review. *Physical and Occupational Therapy in Geriatrics*. 2011;29(2):102-125.
- Thornton M, Travis SS. Analysis of the reliability of the Modified Caregiver Strain Index. *Journal of Gerontology*. 2003;58B(2):S127-132.
- Hurria A, Gupta S, Zauderer M, Zuckerman EL, Cohen HJ, Muss H. Developing a cancer-specific geriatric assessment. *Cancer*. 2005;104:1998-2005.
- McCleary NJ, Wigler D, Berry D, Sato K, Abrams T, Chan J, Meyerhardt JA. Feasibility of computer-based self-administered cancer-specific geriatric assessment in older patients with gastrointestinal malignancy. *The Oncologist*. 2013;18, 64-72.
- Berner ES. Clinical Decision Support Systems: State of the Art: Agency for Healthcare Research and Quality (AHRQ);2009.
- Trivedi M, Daly E, Kern J, Grannemann B, Sunderajan P, Claassen C. Barriers to implementation of a computerized decision support system for depression: an observational report on lessons learned in "real world" clinical settings. *BMC Medical Informatics and Decision Making*. 2009;9(1):6.
- Gray LC, Berg K, Fries BE, Henrard JC, Hirdes JP, Steel K, et al. Sharing clinical information across care settings: The birth of an integrated assessment system. *BMC Health Services Research*, 2009. doi: 10.1186/1472-6963-9-71.
- Ellis G, Whitehead MA, O'Neill D, Langhorne P, Robinson D. Comprehensive geriatric assessment for older adults admitted to hospital. *The Cochrane Database of Systematic Reviews*. 2011;2011(7).
- Puts MTE, Hardt J, Monette J, Girre V, Springall E, Alibhai SMH. Use of geriatric assessment for older adults in the oncology setting: A systematic review. *Journal of the National Cancer Institute*. 2012;104:1133-1163.

CHEMOTHERAPY IN OLDER ADULTS WITH COLORECTAL CANCER

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Abstract

Colorectal cancer is the second most common cancer in Australia, with a median age at diagnosis of 70 years. With an aging population, the significance of this condition is increasing. Recent chemotherapy trials demonstrating improved outcomes have either excluded the elderly or demonstrated effectiveness in only a highly selected (well) population of older patients. Physiological changes that occur with increasing age and differences in the biology of the cancer itself create some uncertainty regarding the true benefit of chemotherapy for the majority of elderly patients, likely resulting in considerable undertreatment, either in the form of empirical dose reductions or abstinence. For adjuvant treatment of stage III disease with 5-fluorouracil, pooled subgroup analyses of the small numbers of well elderly included in clinical trials and retrospective population studies suggest the elderly derive a similar benefit. However, the addition of oxaliplatin appears to provide no additional benefit at the expense of added toxicity. There are no studies indicating the optimal treatment in frail patients, though except where predicted lifespan is very short or there is a clear contraindication, adjuvant treatment should be considered. In the metastatic setting, there is similar evidence that fit elderly profit. Frail patients can be treated successfully and derive benefit from single agent 5-fluorouracil. Further studies involving elderly patients that are more representative of the majority are needed, and there is ongoing exploration of how more comprehensive geriatric assessment may help select the patients who are most likely to benefit from treatment, while minimising toxicity.

Australia's population is aging. In 2011, 13.7% of Australians were aged ≥ 65 years and 1.6% were over 85; by 2056 estimates suggest 25% will be over 65 and 5-7% will be over 85.¹ The incidence of colorectal cancer, the second leading cause of cancer death in Australia,² increases with age, with a third of cases occurring in patients older than 75.³

As the elderly remain under-represented in clinical trials, including those for colorectal cancer,^{4,5} there remains uncertainty regarding the relevance of recent substantial treatment advances to older patients. There remains no universally accepted chronological age that defines an elderly person, making comparisons across studies that use differing definitions of 'elderly' challenging. Further, the small numbers of elderly patients included in clinical trials represent a highly selected population, with less comorbidity and polypharmacy, and better performance status and social supports than the majority seen in clinical practice.

Background

Aging is associated with a number of physiological changes across most organ systems (table 1),⁶⁻⁸ some of which may influence the pharmacokinetics of chemotherapeutic agents. Many of these contribute to the reduced physiologic reserve of elderly patients and may affect both treatment tolerability and outcomes.

Right-sided colon cancers,⁹ microsatellite instability (MSI),¹⁰ and BRAFV600E mutation,¹¹ have been reported at greater frequency with increasing age, and are thought to characterise tumorigenesis via the serrated neoplasia pathway.¹² While the clinical implications have yet to be clearly defined, right-sided and BRAF-mutant tumours have been separately associated with worse survival and distinct patterns of spread.^{13,14} Furthermore, screening colonoscopy may confer less protection from flat tumours located in the right colon.¹⁵ Conversely, MSI has an opposing positive prognostic effect, particularly in early stage colon cancer,^{10,16} and is associated with a lack of benefit from adjuvant 5-fluorouracil (5FU) chemotherapy.¹⁷

Older cancer patients are a heterogeneous group, with the variable reductions in physiological reserve and rates of comorbidity not reliably captured in standard measures of function such as the Eastern Cooperative Oncology Group and Karnofsky performance status scales. Comprehensive geriatric assessment, including multi-disciplinary assessment of ability to complete activities of daily living, comorbidities, cognition, psycho-social status, nutritional status, medication use and advanced care preferences can assist in predicting life expectancy and toxicity from chemotherapy, and in reducing morbidity.^{18,19} While obviously time and resource-consuming, more concise, standardised and validated tools are in development.

Despite subset analyses of the elderly patients enrolled in clinical trials concluding that fit elderly patients should

Table 1: Summary of selected physiological changes occurring in the well elderly. May be further exacerbated by comorbidities. Abbreviations: SBP systolic blood pressure, HT hypertension, GFR glomerular filtration rate, GI gastrointestinal, t1/2 half life.

System	Change	Examples of potential relevance
Cardiovascular	<ul style="list-style-type: none"> ↑ sympathetic activity) ↑ ↓ parasympathetic activity) SBP ↑ arterial wall thickness ↓ ventricular compliance Thickening aortic and mitral valves 	<ul style="list-style-type: none"> ↑ HT/vascular events with Bevacizumab ↑ coronary vasospasm with 5FU ↑ risk cardiac failure ↑ vasomotor instability may become exaggerated with volume depletion
Cerebrovascular/ Neurological	<ul style="list-style-type: none"> ↓ cerebral perfusion reserve ↓ response of cerebral blood flow to postural change Changes in cognition including memory Changes in myelin 	<ul style="list-style-type: none"> ↑ risk syncope/falls ↑ risk delirium ↑ risk peripeheral neuropathy
Renal	<ul style="list-style-type: none"> ↓ renal blood flow ↓ renal mass ↓ GFR ↓ plasma renin-aldosterone levels ↓ concentrating ability 	<ul style="list-style-type: none"> ↑ risk volume depletion ↑ risk pre-renal renal impairment ↑ risk toxicity with renally cleared drugs (eg capecitabine) ↑ risk electrolyte disorders
Hepatic	<ul style="list-style-type: none"> ↓ hepatic mass and blood flow ↓ cytochrome P450 content 	Rarely of clinical significance on its own, but may be exaggerated by metastatic disease or comorbidities.
Gastrointestinal	<ul style="list-style-type: none"> Mucosal atrophy ↓ GI mucosal protective mechanisms ↓ gastric blood flow ↓ gastric and GI motility ↓ enzyme secretion 	<ul style="list-style-type: none"> ↓ absorption (rarely clinically significant) ↑ susceptibility to mucositis eg 5FU ↑ intestinal accumulation of a metabolite of irinotecan → may ↑ risk diarrhoea
Musculoskeletal	<ul style="list-style-type: none"> ↑ sarcopenia ↑ bone loss ↓ balance (vestibular/CNS/musculokkeletal factors) 	
Body composition	<ul style="list-style-type: none"> ↓ muscle mass ↑ total body fat ↓ total body water ↓ albumin (but not in well elderly) 	<ul style="list-style-type: none"> ↑ volume distribution lipid soluble drugs → increased t1/2 ↓ volume distribution hydrophilic drugs → ↑ peak concentration
Haemopoietic	<ul style="list-style-type: none"> ↓ bone marrow reserve 	↑ risk cytopenias (severity and duration)
Endocrine	<ul style="list-style-type: none"> ↓ sex hormones Altered cortisol secretion Altered glucose metabolism 	
Immune	<ul style="list-style-type: none"> ↓ T and B cell function Alterations in complement activation 	↑ susceptibility to infection

receive standard chemotherapy doses, empirical age-related dose reductions are frequent in routine care. For example, in a recent survey of Australian oncologists, 23% reported routinely dose reducing in the fit elderly.²⁰ While the potential for undertreatment is concerning, particularly in the adjuvant setting, many would argue that the experience of the select elderly entered on to research studies, does not reflect the reality of what can be safely delivered for the majority of older patients.

Adjuvant treatment

A5FU-based adjuvant treatment for stage III colon cancer reduces the risk of recurrence by 30% and cancer-related death by 25-30%.²¹ Capecitabine provides a similar benefit.²² A small additional survival benefit from the addition of oxaliplatin has also been demonstrated.^{23,24}

Subgroup analyses of outcomes for elderly patients in clinical trials, including pooled data from seven trials involving 3351 patients,²⁵ suggest an equal benefit for elderly patients from use of adjuvant 5FU. Compared to surgery alone, receipt of 5FU/Leucovorin Calcium (LV) was associated with a hazard ratio (HR) for death of 0.76 (95% CI 0.68-0.85), corresponding to a 7% absolute improvement in five-year survival for all patients (71% v 64%), independent of age. Furthermore, increased age was not associated with a significantly increased risk of

grade 3 or 4 nausea, vomiting, stomatitis or diarrhoea. There was a trend to increased rates of severe leucopenia.

An analysis of the X-ACT trial²² demonstrated that the equivalence of capecitabine was maintained in the 396 (20%) patients aged 70-75 years. However, fewer elderly (75-80 year- old) patients completed the planned course of treatment compared to younger patients (74% v 85%), with a trend for more dose modifications in older patients (61% v 51%).

In contrast to studies utilising a fluoropyrimidine alone, subgroup analyses from the two studies where oxaliplatin was added to 5FU, found no benefit from the addition of oxaliplatin in patients over 70 years of age.^{23,24} Further, the addition of oxaliplatin resulted in increased rates of neutropenia, thrombocytopenia and fatigue.³⁰ Analysis of the MOSAIC trial²³ found a significant increase in second cancers in older patients treated with oxaliplatin compared to younger patients (11% v 4%, p=0.001), with no age-related difference in the 5FU arm.

Retrospective analyses of cohorts from various clinical databases (table 2) have explored the benefit of 5FU/LV in 'real world' practice. Consistent with clinical trial data, these suggest a similar benefit for elderly patients, with infusional 5FU better tolerated than bolus.²⁶

Unfortunately, as the patients selected for treatment are

Table 2: Summary of selected retrospective population studies assessing effectiveness of adjuvant 5FU chemotherapy in CRC.

Study	N	Age	Population/cohort	Overall survival (chemotherapy vs none)
Abraham ²⁹	27,805	32% 74-84 y/o 13% 85-94 y/o	California Cancer Registry 1994-2008	HR 0.73 95% CI 0.70-0.77
Jessup ³⁰	26,600	30% 75-79 y/o 22% >80 y/o	National Cancer Database 1990-2002	0.84 95% CI not given
Steenbergen ²⁸	8051	All ≥ 75	Netherlands Cancer Registry 1997-2009	HR 0.50 95% CI 0.40-0.50
Sanoff ²⁷	5498	All ≥ 75	2004-2007 SEER-Medicare, NYSCR, NCCN, CanCOs	HR 0.60 95% CI 0.53-0.68
Sundarajan ³¹	4768	All ≥ 65	SEER-Medicare 1992-1996	HR 0.66 95% CI 0.60-0.73

inevitably a fitter population than those not treated, the impact of non-cancer deaths is a major confounder. Indeed, a number of studies report a greater survival benefit for adjuvant treatment than was observed in clinical trials enrolling young and fit patients, which seems implausible, particularly given the frequent use of routine chemotherapy dose reductions in older patients.^{20,27,28} In the absence of data on recurrence rates and cancer-specific mortality, the true impact of treatment remains uncertain.

Despite data demonstrating that the survival benefit of fluoropyrimidine-based treatment is maintained in older patients, use in practice inevitably declines with advancing age in multiple international series.^{27,29,30} Recent Australian data of 658 patients at Victorian hospitals treated from 2003 – 2012, reports higher overall treatment rates than international series, but a similar decline in treatment use with advancing age.³² Whereas 93% of patients under 65 received adjuvant treatment, this declined to 84% and 41% for patients aged 65-75 and >75 years respectively. However, age alone was rarely the reason that patients were not treated, with increasing comorbidity the dominant reason older patients were not offered treatment. Older patients were also more likely to decline recommended treatment, including 20% of those over 75 years. So overall, age-related variation in treatment is partly due to appropriate clinical decision-making and partly due to patient preference, but there is clear evidence that chronological age is the single most important factor associated with chemotherapy receipt,^{27,30} even in the absence of comorbidity.³³

With ongoing uncertainty regarding the benefit of adjuvant chemotherapy for stage II colon cancer in younger patients,³⁴ routine treatment of older patients with stage II cancers cannot be recommended. Elderly patients are less likely to receive chemoradiation for locally advanced rectal cancer.³⁶⁻³⁸ The evidence is similarly limited by under-inclusion of the elderly in all clinical trials and the clear selection bias of population studies, many of which have conflicting results. In general, it appears that the select group of elderly patients who are able to complete the entire course of chemoradiation do derive a benefit,³⁸ but their ability to do so may be limited by higher rates of toxicity compared to younger patients.³⁹

Metastatic colorectal cancer

The recent introduction of combination chemotherapy, with oxaliplatin and irinotecan, and biologic agents such as bevacizumab and cetuximab, has consistently seen survival in clinical studies approaching two years and beyond.

As with adjuvant treatment, there are a number of retrospective observational studies and analyses of the small numbers of elderly patients from clinical trials examining the efficacy and safety of all the various chemotherapeutic and biologic options for advanced disease. With life expectancy for patients with metastatic disease being around 20 months, the likelihood of death from competing causes of mortality confounding data interpretation is much less than for adjuvant studies, where survival at and beyond five years is more the focus.

Folprecht et al retrospectively analysed data from 3825 patients who received 5FU-based treatment in 22 European trials between 1982 and 1996.⁴⁰ For the 629 patients (16%) aged at least 70 years, response rates, progression-free survival and overall survival were similar to younger patients. A study of 339 patients who received second line irinotecan showed that patients over 70 years derived a similar benefit without increased toxicity.⁴¹ Ershler et al, reviewing capecitabine data from four studies, concluded that it was equally effective to 5FU/LV in elderly patients, with no evidence that the elderly experienced increased toxicity after adjustment for creatinine clearance.⁴² Other groups have similarly shown that the toxicity of capecitabine is not greater in the elderly if renal function is taken into account.⁴³

A combined analysis of source data from four first-line phase 3 trials comparing irinotecan containing regimens to 5FU/LV alone, demonstrated no significant interaction between age and treatment effect. No grade 3 or 4 toxicities were more frequent among the elderly patients.⁴⁴ A subset analysis of pooled data from pivotal studies concluded that this agent maintained its efficacy and safety ratio in the selected elderly patients who enrolled.⁴⁵

The MRC FOCUS 246 study, a randomised trial specifically assessing outcomes in elderly and frail patients not fit for full dose chemotherapy due to age or frailty, showed that the addition of oxaliplatin at modified doses did not produce a progression-free or overall survival benefit. In a 2x2 factorial design, 459 older patients (median age 74 years, with 13% 80 years plus) were randomised to receive oxaliplatin with a fluoropyrimidine or fluoropyrimidine alone. With treatment initiated at 80% of standard dose, in the absence of significant toxicity, 35% of patients had planned dose escalations after six weeks, with 33% continuing at their initial dose. Further analyses suggested a negative effect on quality of life with oxaliplatin receipt. Other important findings of this study included similar efficacy and quality of life for 5FU versus capecitabine as single agents, but increased toxicity with capecitabine, including nausea, vomiting, anorexia and hand-foot syndrome.

In an analysis of the 99 (21%) patients aged 75-86 years in the AGITG MAX study,⁴⁷ the progression-free survival benefit of adding bevacizumab to capecitabine was maintained. Other studies have also shown that the addition of bevacizumab to single agent 5FU irinotecan/5FU and oxaliplatin-containing regimens improves progression free survival to a similar extent in patients greater than 75 years old.⁴⁸⁻⁵¹ An increased risk of thromboembolic events has been reported in many,⁵²⁻⁵⁴ but not all studies in these patients,⁴⁷ mainly due to myocardial infarcts and strokes, with a hazard ratio of 2.5-3.0.⁵⁵ Other toxicities, such as gastrointestinal perforation, proteinuria and bleeding, do not appear to be increased in the elderly. A recent prospective study of patients aged 65 or older,⁵⁶ which importantly did include a geriatric assessment at baseline, reported an increase in severe toxicity in patients receiving bevacizumab in combination with chemotherapy. While this was predominantly due to an increased rate of hypertension, which in most instances is manageable with additional medication, the selection of patients who were to receive bevacizumab (lower in patients with heart disease) confounds comparison of treatment groups.

There is no apparent impact of age on the efficacy or the toxicity of cetuximab.⁵⁷⁻⁵⁹ As an example, a study of 614 patients included 49.7% at least 66 years of age (range 18-89), with cetuximab given alone or in combination with irinotecan at the discretion of the treating physician.⁵⁹ Response rate, progression-free survival and toxicity did not vary with age.

In an analysis of 2049 patients aged over 65 years using SEER-Medicare data from 2002 and 2005, 49% of patients had received 5 fluorouracil folinic acid, 25% irinotecan and 26% oxaliplatin. Survival benefits associated with receipt of oxaliplatin or irinotecan were consistent across age groups, including those over 75 years.⁶⁰ Another study of 2314 patients from the South Australian Clinical Registry found that, compared to patients less than 80 years old, those over 80 were less likely to receive chemotherapy (68.2% v 29.2%), less likely to receive combination therapy (74% v 28%) and had a significantly shorter median survival (19.2 months v 8.2 months).⁶¹ However, the median survival of those over 80 years who received any chemotherapy was similar to that of younger patients.

As with adjuvant therapy, chemotherapy receipt for metastatic disease in routine clinical care is inversely associated with age. In a retrospective cohort study of consecutive patients in the Netherlands between 2002 and 2007, only 19% of patients over the age of 70 received palliative chemotherapy, whereas 64% of those less than 70 received treatment.³³ Where treated, the elderly are less likely to receive initial combination treatment, or to receive oxaliplatin, irinotecan and bevacizumab at any time.⁶² Similar findings were reported in a series of 864 consecutive metastatic CRC patients enrolled in the prospective Australian multicentre Treatment of Recurrent and Advanced Colorectal Cancer database since mid-2009, where 507 (59%) patients were aged 65 years.⁶³ In this cohort, 71% received first-line chemotherapy, with 47% also receiving bevacizumab. The use of first-line chemotherapy declined significantly with increasing age, from 83% in patients aged 65-75 years to 36% in those aged \geq 85 years. Older patients were also significantly less likely to receive combination regimens or bevacizumab.

Conclusion

With the elderly continuing to be underrepresented in clinical trials, and the elderly patients that are recruited being a select population, firm conclusions are difficult to reach. In the adjuvant setting, a number of pooled analyses of elderly patients from clinical trials and observational population studies suggest fluoropyrimidine-based treatment should be considered in fit older patients. With a healthy 75 year-old currently having a predicted life expectancy of more than 13 years for females and 11 years for males,⁶⁴ the vast majority are likely to live long enough for recurrent cancer to impact their survival. With further advances in age, and diminishing life expectancy, the potential benefit of adjuvant therapy is reduced, and clinicians do need to become increasingly selective in the patients to whom they recommend treatment. The addition of oxaliplatin is not beneficial in patients over 70 years of age, and is also associated with an excess of early and late toxicity.

In the metastatic clinical cases, we similarly have evidence that the fit elderly benefit from palliative chemotherapy and targeted biological agents. In particular, cetuximab therapy appears to be equally well tolerated in the elderly, and with the exception of thromboembolic events, the same can be said for bevacizumab. The FOCUS 2 study suggests that single agent treatment with 5FU is a preferred strategy in frail patients. Further studies of this nature are critical to advancing our knowledge of the optimal treatment of older patients; the reality is that the majority of elderly patients are neither fit nor frail. It is for this group that more sophisticated methods of evaluation, such as comprehensive geriatric assessment, may help guide treatment decisions in the future and this remains a very active area of research.

References

1. Australian Bureau of Statistics. Australian Demographic Statistics June 2012. Cat No 3101.0. Nov 2012: ABS Canberra.
2. Australian Institute of Health and Welfare & Australasian Association of Cancer Registries 2012. Cancer in Australia: an overview 2012. Cancer series no. 74. Cat. No. CAN 70. AIHW: Canberra.
3. Australian Institute of Health and Welfare (AIHW) 2012. Australian Cancer Incidence and Mortality (ACIM) Books. AIHW: Canberra.
4. Hutchins L, Unger J, Crowley J, Coltman C, Albain K. Underrepresentation of patients 65 years of age or older in cancer treatment trials. *N Engl J Med* 1999;341(27):2061-7.
5. Townsley C, Sleby R, Siu L. Systemic review of barriers to the recruitment of older patients with cancer onto clinical trials. *J Clin Oncol*. 2005;23:3112-24.
6. Klotz U. Pharmacokinetics and drug metabolism in the elderly. *Drug Met Reviews* 2009;41(2):67-76.
7. Sawhney R, Sehl M, Naeim A. Physiologic Aspects of Aging: Impact on Cancer Management and Decision Making, Part 1. *Cancer J* 2005;11:449-460.
8. Sawhney R, Sehl M, Naeim A. Physiologic Aspects of Aging: Impact on Cancer Management and Decision Making, Part 2. *Cancer J*. 2005;11:461-473.
9. Cooper GS, Yuan Z, Landefeld CS, Johanson J, Rimtn A et al: A national population-based study of incidence of colorectal cancer and age. Implications for screening in older Americans. *Cancer* 1995;75:775-81
10. Samowitz WS, Curtin K, Ma K, Schaffer L, Coleman L, Leppert M et al: Microsatellite instability in sporadic colon cancer is associated with an improved prognosis at the population level. *Cancer Epidemiol Biomarkers Prev*. 2001;10:917- 923.
11. Tie J, Gibbs P, Lipton L, Christie M, Jorissen R, Burgess A et al: Optimizing targeted therapeutic development: analysis of a colorectal cancer patient population with the BRAF(V600E) mutation. *Int J Cancer*. 2011;128:2075-84.
12. Kambara T, Simms LA, Whitehall VLJ, Spring K, Wynter C, Walsh M et al: BRAF mutation is associated with DNA methylation in serrated polyps and cancers of the colorectum. *Gut*. 2004;53:1137-44.
13. Benedix F, Kube R, Meyer F, Schmit U, Gasting I, Lippert H: Comparison of 17,641 patients with right- and left-sided colon cancer: Differences in epidemiology, perioperative course, histology, and survival. *Dis Colon Rectum*. 2010;53:57-64
14. Tran B, Kopetz S, Tie J, Gibbs P, Jiang Z, Lieu C et al: Impact of BRAF mutation and microsatellite instability on the pattern of metastatic spread and prognosis in metastatic colorectal cancer. *Cancer*. 2011;117:4623-32.
15. Brenner H, Hoffmeister M, Arndt V, Stegmaier L, Altenhofen L, Haug U: Protection from right- and left- sided colorectal neoplasms after colonoscopy: Population-based study. *J Natl Cancer Inst*. 2010;102:89-95
16. Popat S, Hubner R, Houlston RS: Systematic review of microsatellite instability and colorectal cancer prognosis. *J Clin Oncol*. 2004;23:609-618.
17. Sargent DJ, Marsoni S, Monges G, Thibodeau S, Labianca R, Hamilton S et al: Defective mismatch repair as a predictive marker for lack of efficacy of fluorouracil-based adjuvant therapy in colon cancer. *J Clin Oncol*. 2010;28:3219
18. Extermann M, Hurria A. Comprehensive geriatric assessment for older patients with cancer. *J Clin Oncol*. 2007;25(14):1824-31.
19. Hurria A, Togawa K, Mohil S, Owusu C, Klepin H, Gross C et al. Predicting chemotherapy toxicity in older adults with cancer: a prospective multicentre study. *J Clin Oncol*. 2011;29(25):3457-65.
20. Field K, Kosmider S, Jefford M, Michael M, Jennens R, Green M et al. Chemotherapy Dosing Strategies in the Obese, Elderly and Thin Patient: Results of a Nationwide Survey. *J Oncol Practice*. 2008;4(3):108-113.
21. Gill S, Lopriniz , Sargent D, Thome S, Alberts S, Haller D et al. Pooled

- analysis of fluorouracil-based adjuvant therapy for stage II and III colon cancer: Who benefits and by how much? *J Clin Oncol.* 2004;22:1797-1806.
22. Twelves C, Scheithauer W, McKendrick J, Seitz J, Hazel G, Wong A et al. Capecitabine versus 5- fluorouracil/folinic acid as adjuvant therapy for stage III colon cancer: final results from the X-ACT trial with analysis by age and preliminary evidence of a pharmacodynamic marker of efficacy. *Ann Oncol.* 2012;23(5):1190-1197.
 23. Andre T, Boni C, Mounedji-Boudiaf L, Navarro M, Tabernero J, Hickish T et al. Oxaliplatin, fluorouracil and leucovorin as adjuvant treatment for colon cancer: The Multicentre International Study of Oxaliplatin/5-Fluorouracil/Leucovorin in the Adjuvant Treatment of Colon Cancer (MOSAIC) Investigators. *N Engl J Med.* 2004;350:2343-2351.
 24. Yothers G, O'Connell M, Allegra C, Kuebler J, Colangelo L, Oettrli N et al. Oxaliplatin As Adjuvant Therapy for Colon Cancer: Updated Results of NSABP C-07 Trial, Including Survival and Subset Analyses. *J Clin Oncol.* 2011; 29(28):3768-3774/
 25. Sargent D, Goldberg R, Jacobsen S, Macdonald J, Labianca R, Haller D et al. A Pooled Analysis of Adjuvant Chemotherapy for Resected Colon Cancer in Elderly Patients. *N Engl J Med.* 2011;345(15):1091-1097.
 26. Chau I, Norman A, Cunningham D, Tait D, Ross P, Iveson T et al. A randomised comparison between 6 months of bolus fluorouracil/leucovorin and 12 weeks protracted venous infusion fluorouracil as adjuvant treatment in colorectal cancer. *Ann Oncol.* 2005;16: 549-557
 27. Sanoff H, Carpenter W, Sturmer T, Goldberg R, Martin C, Fine J et al. Effect of Adjuvant Chemotherapy on Survival of Patients With Stage III Colon Cancer Diagnosed After Age 75 Years. *J Clin Oncol.* 2012; 30(21):2624-2534.
 28. Steenbergen L, Lemmens V, Rutten H, Wymenga A, Nortier J, Janssen-Heijnen M. Increased adjuvant treatment and improved survival in elderly stage III colon cancer patients in The Netherlands. *Ann Oncol.* 2012; 23(11):2805-2811.
 29. Abraham A, Habermann E, Rothenberger D, Kwaan M, Weinberg A, Parsons H et al. Adjuvant Chemotherapy for Stage III Colon Cancer in the Oldest Old. Results Beyond Clinical Guidelines. *Cancer.* 2013;119(2):395-403.
 30. Jessup J, Stewart A, Greene F, Minsky B. Adjuvant chemotherapy for stage III colon cancer: implications of race/ethnicity, age and differentiation. *J Am Med Assoc.* 2005; 294(21): 2703.
 31. Sundararajan V, Mitra N, Jacobson J, Grann V, Heitjan D, Neugut A. Survival associated with 5- fluorouracil-based adjuvant chemotherapy among elderly patients with node positive colon cancer. *Ann Int Med.* 2002;136:349-357.
 32. Heong V, Wong H, Tie J, Jefford M, Field K, Kosmider S et al. Understanding why some people with stage III colon cancer do not receive adjuvant chemotherapy. *Proc ASCO 2013:* in press.
 33. Jonker J, Hamaker M, Soesan M, Tulner C, Kuper I. Colon Cancer treatment and adherence to guidelines: Does age still matter? *J Geriatr Oncol.* 2012;3(2):131-137.
 34. National Comprehensive Cancer Network: NCCN Clinical Practice Guidelines in Oncology: Colon Cancer.
 35. Hung A, Mullins C. Relative Effectiveness and Safety of Chemotherapy in Elderly and Nonelderly Patients with Stage III Colon Cancer: A Systematic Review. *Oncologist.* 2013;18:54-63
 36. Cohen S, Neugut A. Adjuvant therapy for rectal cancer in the elderly. *Drug Aging* 2004;21(7):437-451.
 37. Pasetto L, Rossi E, Jirillo A, Monfardini S. Colorectal cancer adjuvant treatment in elderly patients. *Crit Rev Oncol Haem.* 2005;55(3):201-206.
 38. Dobie S, Warren J, Matthews B, Schwartz D, Baldwin L, Billingsley K. Survival Benefits and Trends in Use of Adjuvant Therapy Among Elderly Stage II and III Rectal Cancer Patients in the General Population. *Cancer.* 2008;112(4):789-799
 39. Shahir M, Lemmens V, Poll-Franse L, Voogd A, Janssen-Heijnen M. Elderly patients with rectal cancer have a higher risk of treatment related complications and a poorer prognosis than younger patients: a population-based study. *Eur J Cancer.* 2006;42(17):3015-3021.
 40. Folprecht G, Cunningham D, Ross P, Glimelius B, Costanzo F, Wils J et al. Efficacy of 5-fluorouracil- based chemotherapy in elderly patients with metastatic colorectal cancer: a pooled analysis of clinical trials. *Ann Oncol.* 2004;15:1330-1338.
 41. Chau I, Norman A, Cunningham D, Waters J, Topham C, Middleton G et al. Elderly patients with fluoropyrimidine and thymidylate synthetase inhibitor-resistant advanced colorectal cancer derive similar benefit without excessive toxicity when treated with irinotecan monotherapy. *Br J Cancer.* 2004;91:1453-1458.
 42. Ershler W. Capecitabine use in geriatric oncology: An analysis of current safety, efficacy and quality of life data. *Crit Rev Oncol Hematol.* 2006;58:68-78.
 43. Cassidy J, Twelves C, Van Cutsem, Hoff P, Bajetta E, Boyer M et al. First-line oral capecitabine therapy in metastatic colorectal cancer: a favourable safety profile compared with intravenous 5-fluorouracil/leucovorin. *Ann Oncol.* 2002;13:566-575.
 44. Folprecht G, Seymore M, Saltz L, Douillard J, Hecker H, Stephens R et al. Irinotecan/Fluorouracil Combination in First-Line Therapy of Older and Younger Patients With Metastatic Colorectal Cancer: Combined Analysis of 2,691 Patients in Randomized Controlled Trials. *JCO.* 2008;26(9):1443-1451.
 45. Goldberg R, Tabah-Fisch I, Bleiberg, Gramont A, Tournigard C, Andre T et al. Pooled Analysis of Safety and Efficacy of Oxaliplatin Plus Fluorouracil/Leucovorin Administered Bimonthly in Elderly Patients With Colorectal Cancer. *JCO.* 2006;24(25):4085-4090.
 46. Seymore M, Thompson L, Wasan H, et al. Chemotherapy options in elderly and frail patients with metastatic colorectal cancer (MRC FOCUS 2): an open-label, randomised factorial trial. *Lancet.* 2011; 377:1749-1759.
 47. Price T, Zannino D, Wilson K, Simes R, Cassidy J, VanHazel G et al. Bevacizumab is equally effective and no more toxic in elderly patients with advanced colorectal cancer: a subgroup analysis from the AGITG MAX trial: an international randomised controlled trial of Capecitabine, Bevacizumab and Mitomycin C. *Ann Oncol.* 2012;23:1531-1536.
 48. Kabbinar F, Hurwitz H, Yi J, Sarkar S, Rosen O. Addition of bevacizumab to fluorouracil-based first line treatment of metastatic colorectal cancer: pooled analysis of cohorts from two randomised clinical trials. *Am J Clin Oncol.* 2009;27(2):199-205.
 49. Hurwitz H, Fehrenbacher L, Novotny W, Cartwright T, Hainsworth J, Heim W et al. Bevacizumab plus irinotecan, fluorouracil and leucovorin for metastatic colorectal cancer. *N Engl J Med.* 2004;350:2335-2342.
 50. Sattl L, Clarke S, Daiz-Rubio E, Scheithauer W, Figer A, Wong R et al. Bevacizumab in combination with oxaliplatin-based chemotherapy as first line therapy in metastatic colorectal cancer: a randomised phase III study. *Am J Clin Oncol.* 2008;26:2013-2019.
 51. Giantonio B, Catalano P, Meropol N O'Dwyer P, Mitchell E, Alberts Set al. Bevacizumab in combination with oxaliplatin, fluorouracil and leucovorin (FOLFOX4) for previously treated metastatic colorectal cancer: results from the esatern cooperative oncology group study E3200. *Am J Clin Oncol.* 2007;25(12):1539-1544.
 52. Tebbutt N, Murphy F, Zannino D, Wilson K, Cumins M, Abdi E et al. Risk of arterial thromboembolic events in patients with advanced colorectal cancer receiving bevacizumab. *Ann Oncol* 2011;22(8):1384-1388.
 53. Scappaticci F, Skillings J, Holden S, Gerber H, Miller K, Kabbinar F et al. Arterial thromboembolic events in patients with metastatic colorectal cancer treated with chemotherapy and bevacizumab. *J National Cancer Inst.* 2007;99(16):1232-1239.
 54. Cassidy J, Saltz L, Giantonio B, Kabbinar F, Hurwitz H, Rohr U. Effect of bevacizumab in older patients with metastatic colorectal cancer: pooled analysis of four randomised studies. *J Cancer Research Clin Oncol.* 2010;136(5):737-743.
 55. Francois E, Guerin O, Follana P, Evesque L, Mari V, Aparicio. Use of bevacizumab in elderly patients with metastatic colorectal cancer: Review. *J Geriatr Oncol.* 2011;2(1):64-71.
 56. Mohile S, Hardt M, Tew W, Owusu C, Klepin H, Gross C et al. Toxicity of Bevacizumab in Combination with Chemotherapy in Older Patients. *Oncologist.* 2013;18:408-414
 57. Asmis T, Powell E, Karapetis C, Jonker D, Tu D, Jeffery M et al. Comorbidity, age and overall survival in cetuximab-treated patients with advanced colorectal cancer (ACRC)- results from NCIC CTG CO.17: a phase III trial of cetuximab versus best supportive care. *Ann Oncol* 2011;22(1):118-126.
 58. Bouchahda M, Macarulla T, Spano J, Bachet J, Lledo J, Andre G et al. Cetuximab efficacy and safety in a retrospective cohort of elderly patients with heavily pre- treated metastatic colorectal cancer. *Crit Review Oncol Haematol.* 2008;67(3):255-262.
 59. Jehn C, Bonning L, Kroning H, Possinger K, Lufner D. Cetuximab-based therapy in elderly comorbid patients with metastatic colorectal cancer. *Br J Cancer.* 2012;106:274-278
 60. Mullins C, Hsiao F, Onukwughu E, Pandya N, Hanna N. Comparative and Cost- Effectiveness of Oxaliplatin-Based or Irinotecan-Based Regimens Compared With 5-Fluorouracil/Leucovorin Alone Among US Elderly Stage IV Colon Cancer Patients. *Cancer.* 2012;118(12):3173-3181.
 61. Kumar R, Jain K, Beeke C, Price T, Townsend A, Padbury R et al. A Population-Based Study of Metastatic Colorectal Cancer in Individuals Aged > 80 Years. *Cancer.* 2013;119(4):722-728.
 62. McKibbin T, Frei C, Greene R, Kwan P, Simon J, Koeller J. Disparities in the Use of Chemotherapy and Monoclonal Antibody Therapy for Elderly Advanced Colorectal Cancer Patients in the Community Oncology Setting. *Oncologist.* 2008;13(8):876-885.
 63. Parakh S, Ali S, Wong H, Field K, Shapiro J, Nott L et al: Patterns of care of elderly patients with metastatic colorectal cancer. *Proc ASCO 2013:* in press.
 64. Australian Bureau of Statistics. Life Tables, States, Territories and Australia, 2009-2011. Cat No 3302.0.55.001. 2012 Nov ABS Canberra

RESEARCH PRIORITIES IN GERIATRIC ONCOLOGY FOR 2013 AND BEYOND

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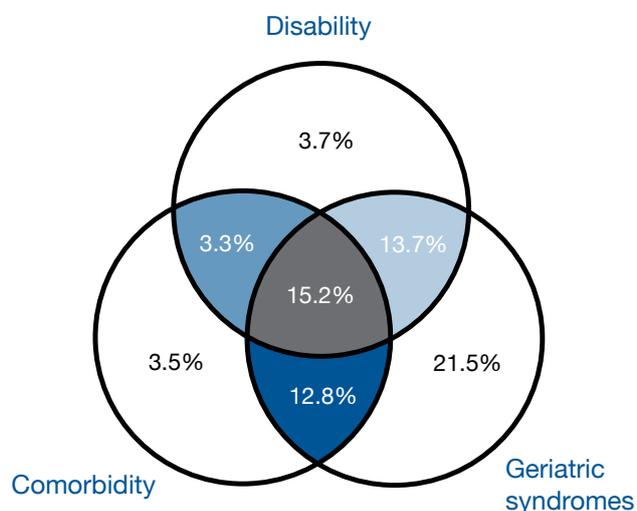
Abstract

The incidence of cancer increases with advanced age. Unfortunately, there is a significant lack of evidence regarding the safety and efficacy of treatments. The oncology community also lacks information regarding which older patients are most likely to benefit from treatment without undue toxicities. Interventions to lower symptoms and reduce long-term complications from cancer and cancer treatment in older patients are urgently needed. Establishing research priorities in geriatric oncology could help guide researchers and focus efforts on interventions that have the highest likelihood of improving outcomes. The Cancer and Aging Research Group, in partnership with the National Institute on Aging and National Cancer Institute, held linked conferences as part of a U13 grant in September of 2010 and November of 2012, summarising the gaps in knowledge in geriatric oncology and recommending ways to close these gaps. The overall purpose of this review is to highlight the important research priorities in geriatric oncology from the literature and from the previous U13 meetings. More evidence regarding the treatment of older cancer patients is urgently needed given the rapid aging of the population.

Approximately 60% of all cancers and 70% of cancer mortality occur in people aged 65 years and over.¹ It is anticipated that 70% of all cancer diagnoses will occur in adults aged ≥ 65 by the year 2030.² Because clinical trials include only a small proportion of older patients,³ we lack important and necessary information on efficacy and safety of therapeutic oncology treatments in patients who are older, with health status issues besides their cancer.

Older cancer patients often have other health status concerns. For example, in a group of older patients with newly diagnosed cancer from a population-based database, 15% had three or more significant comorbidities, disability and geriatric syndromes (figure 1). The Comprehensive Geriatric Assessment (CGA) is an evaluation tool utilised by geriatricians to assess an older patient's health status. CGA includes an evaluation of functional status, comorbidity burden, cognition, social support system, nutrition and medication review. Studies of geriatric oncology patients reveal that measures within CGA can predict postoperative morbidity, toxicity of chemotherapy and mortality.⁴ Because of the perceived importance of the CGA in the geriatric oncology community, research has focused on defining the reliability and predictive value of the CGA in cancer patients. Although the oncology community has come a long way in recognising aging issues, there is much more that could be done to improve the outcomes of older cancer patients. Below, we summarise research priorities in geriatric oncology for 2013 and beyond.

Figure 1: Disability, comorbidity, and geriatric syndromes among older, newly-diagnosed cancer patients.



Incorporate geriatric assessment tools into clinical trials that predict adverse outcomes for older adults with cancer.

Currently, oncologists assess functional status by assigning a Karnofsky performance status (KPS) or Eastern Cooperative Oncology Group (ECOG) performance status score,^{5,6} generic scales which are a one-item numeric global assessment of functional status rated by the healthcare provider. They are applied to all adult cancer patients, regardless of age, and are used to estimate functional status in order to determine a treatment course, assess eligibility for clinical trials and predict treatment toxicity

and survival.^{7,8} Although KPS and ECOG performance measures are commonly used and do correlate with treatment toxicity, these tools do not predict survival or outcomes as well as CGA in the elderly.⁹⁻¹¹ For this reason, according to the National Cancer Comprehensive Network guidelines, CGA should be a key part of the treatment approach for older cancer patients.¹²

Key domains within the CGA are assessments of functional status and physical performance. Commonly utilised tools for evaluation of functional status in the geriatric population are evaluation of ADLs (Activities of Daily Living) and Instrumental (I)ADLs. ADLs are skills required for basic self-care,¹³ and IADLs include the ability to perform daily tasks required for independent living.¹⁴ The need for ADL and IADL assistance has been associated with poorer overall survival in geriatric oncology patients.¹⁵ Older cancer patients have a higher prevalence of ADL and IADL deficiencies when compared to age-matched controls.¹⁶ Physical performance measures objectively evaluate mobility and fall risk.^{17,18} Objective measures of physical performance include the Short Physical Performance Battery, gait speed, six-minute walk test, chair stands, isometric grip strength and the 'Timed Get Up and Go' test. These directly observed measures can supplement self-report measures of functional status.

Other domains in the CGA, such as an assessment of comorbidity, nutritional status and cognition, can also identify older cancer patients at risk for adverse outcomes. Among cancer patients, comorbidity is associated with poorer treatment tolerance and overall survival.¹⁹⁻²³ Furthermore, patients with comorbid conditions often take several medications which may predispose patients to the risks of polypharmacy and drug-drug interactions.²⁴ Poor nutritional status is associated with an increased need for functional assistance and poorer overall survival in the geriatric population.²⁵ Unintentional weight loss during the six months prior to chemotherapy is associated with lower chemotherapy response rates and lower overall survival.²⁶ High-risk patients can be identified through self-reported weight loss of >10% of body weight, calculation of Body Mass Index (BMI) with BMI < 20 associated with adverse outcomes, and/or the Mini-Nutritional Assessment (MNA). The MNA has been shown to be a sensitive and specific tool for identifying malnutrition in the elderly population.²⁷ A cognitive assessment is needed to determine if the patient has the capacity to consent to treatment, to adhere to supportive care medication instructions and to understand the indications to seek attention. In the presence of cognitive impairment, the involvement of the patient's family or caregiver is required to maintain safety.²⁸⁻³¹ In both the geriatric and oncology literature, social isolation has been linked to an increased risk of mortality.³²⁻³⁴

Two studies have rigorously evaluated the role of CGA for predicting toxicity from chemotherapy. In a study led by Hurria and performed by the Cancer and Ageing Research Group (CARG) (n = 500), CGA variables were associated with grade 3-5 toxicity.³⁵ A risk-stratification schema which scored patients from 0-23 was developed. Factors that were associated with risk included age >72, GI or GU cancer type, receiving full standard dose or more

than one chemotherapy agent, the presence of anemia [$<11\text{G/dL}$ (male), $<10\text{G/dL}$ (female)] or renal insufficiency (creatinine clearance $<34\text{ ml/min}$) a recent fall, having hearing impairment, needing assistance with IADLs, limited in walking one block and having decreased social activity. A second study, led by Extermann, developed the Chemotherapy Risk Assessment Scale for High-Age Patients Score in over 500 patients.³⁶ The best model for hematologic toxicity included IADL score, LDH level, diastolic blood pressure and chemotherapy intensity. The best predictive model for non-hematologic toxicity included performance status, Mini-Mental State Examination score, MNA score and chemotherapy intensity. Information from two-thirds of the patients was used to develop the risk stratification scheme, and the tool was validated in the remaining one-third of patients.

CGA can also help predict overall survival. One study performed by Kanesvaran et al. evaluated the impact of CGA domains on overall survival and developed a prognostic scoring system, including these elements for use by clinicians. This study included 249 patients of any cancer type, stage and functional status. The majority of patients had GI, GU or lung malignancies, and 84.7% had advanced-stage disease. Factors that were independently associated with overall survival included low albumin, EGOG PS ≥ 2 , abnormal geriatric depression screen, advanced stage disease, malnutrition and advanced age. A nomogram to predict one-year, two-year and three-year overall survival for individual patients, that weights each of these independent variables, was created for use by clinicians.³⁷ More recently, two studies evaluated the predictive value of geriatric assessment tools for survival. Giantin et al examined the value of the Multidimensional Prognostic Index (MPI) in predicting mortality in 160 patients with inoperable or metastatic solid tumour malignancy.³⁸ The MPI was used to stratify individuals into three grades of mortality risk. By six months and 12 months, 34.4% and 46.9% of patients had died, respectively. In multivariable models, the MPI was able to predict six-month and 12-month mortality. Van der Geest et al. examined factors that predict mortality in patients undergoing chemotherapy for colorectal cancer.³⁹ Patients aged 70 and over were enrolled (n=143), with the sample including those receiving adjuvant (38%) or palliative (62%) chemotherapy in a single comprehensive cancer centre in The Netherlands.³⁹ Nutritional status (measured by the MNA) and frailty (Groningen Frailty Indicator) predicted mortality, but only in patients treated with palliative intent.

This research has shown that pre-treatment CGA variables can help identify older adults at increased risk of chemotherapy toxicity and help predict survival. However, we still need validation studies of several of these models for use for specific cancers and treatments. Incorporation of validated tools into clinical research, and potentially clinical care, can help identify which older patients are the most likely to tolerate and benefit from treatment. These tools can be utilised in future research to identify and test interventions to reduce chemotherapy toxicity and improve outcomes in vulnerable older populations.

Test the ability of a geriatric assessment model of care for improving outcomes of older cancer patients.

There is a critical gap in knowledge regarding how to improve outcomes in older adults with cancer.⁴⁰⁻⁴² Despite the fact that the majority of cancer patients are in older age groups, most oncologists have received little specific training in the care of older patients.⁴³ As a result, common problems facing an aging population of cancer patients may go unrecognised and produce serious consequences.^{40,44}

Although CGA may help predict risk from chemotherapy toxicity and survival in older cancer patients, there is no evidence-based approach regarding the use of specific interventions to reduce risk from cancer treatment. CGA-driven interventions were identified as an important area of research by geriatric oncology experts during the first U13 conference, and examples of interventions used within the University of Rochester and University of Chicago Specialised Oncology Care and Research in the Elderly clinics to address vulnerabilities in selected geriatric domains are listed in table 1.⁴⁵

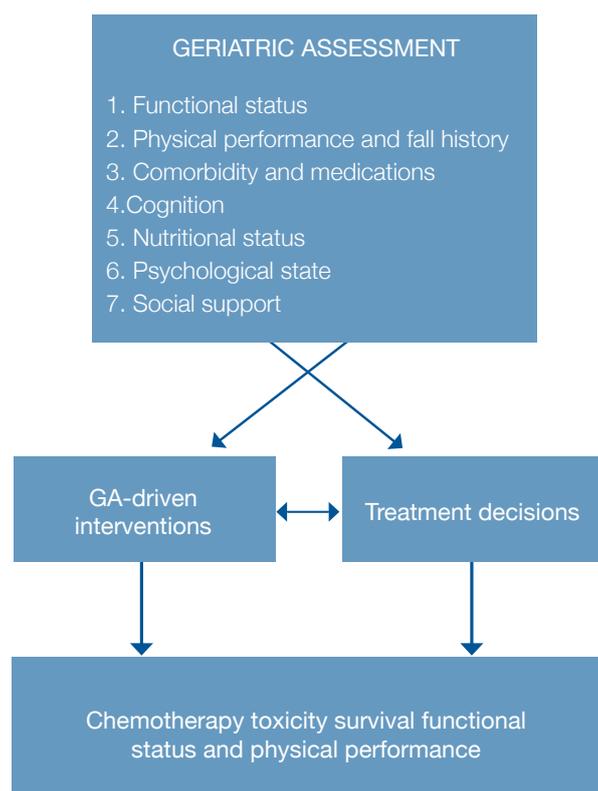
Table 1: SOCARE Pilot Data on GA and GA-driven Interventions

GA domains in relationship to cancer and chemotherapy in older adults	Examples of patient/caregiver concern (from pilot work)	Rating of importance 0-10 with 10=very important median range		GA-driven interventions	Proportion
		Patient	Caregiver		
Cancer treatment recommendations	<ul style="list-style-type: none"> - How does my (or my loved one's) age and underlying health status affect safety and efficiency of treatment? - Will I (or my loved one) live longer with treatment? 	Patient 7 (4-10)	Caregiver 8 (7-10)	<ul style="list-style-type: none"> - Change in type or schedule from original oncology recommendations - Initial dose reduction with escalation as tolerated - More frequent visits - Change in supportive care medications 	<ul style="list-style-type: none"> - 42% - 35% - 44% - 60%
Functional abilities, physical performance and/or falls	<ul style="list-style-type: none"> - How does my (my loved one's) functional status affect tolerance of chemotherapy? - How can I (or my loved one) maintain independence while on chemotherapy? 	10 (8-10)	8 (5-10)	<ul style="list-style-type: none"> - Home/outpatient PT - Home/outpatient OT - Home safety evaluation - Personal emergency response system - Choose chemotherapy that is not neurotoxic if another option exists 	<ul style="list-style-type: none"> - 30% - 19% - 12% - 30% - 30%
Comorbidity polypharmacy	<ul style="list-style-type: none"> - How do specific chronic diseases influence tolerance to cancer treatment? - How do we prevent side-effects from medications? 	7 (0-10)	6 (0-10)	<ul style="list-style-type: none"> - Tailoring of medications - Elimination of dangerous medications - Referral to PCP or specialist for serious chronic medical condition 	<ul style="list-style-type: none"> - 50% - 25% - 10%
Cognition	<ul style="list-style-type: none"> - How does my (or my loved one's) baseline memory affect safety of chemotherapy? - What is the impact of chemotherapy on my (or my loved one's) memory? 	9 (1-10)	8 (4-10)	<ul style="list-style-type: none"> - Assess decision-making capacity - Referral for further diagnostic work-up - Evaluation for reversible causes - Assess support and ability to take medications on own - Frequent visits to assess for delirium - Health care proxy - Social work 	<ul style="list-style-type: none"> - 25% - 25% - 10% - 25% - 25% - 80% - 50%
Psychological status	<ul style="list-style-type: none"> - My loved one is depressed and anxious. How can we help with this? 	8 (0-10)	8 (4-10)	<ul style="list-style-type: none"> - Referral for counseling and social work - Antidepressant 	<ul style="list-style-type: none"> - 25% - 25%
Nutrition	<ul style="list-style-type: none"> - What can we do to improve nutrition? 	9 (6-10)	9 (6-10)	<ul style="list-style-type: none"> - Nutrition consult - Meals on Wheels - Mouth and dental evaluation - Supplements 	<ul style="list-style-type: none"> - 30% - 10% - 30% - 20%
Social support	<ul style="list-style-type: none"> - What are our resources for support at home to allow for safe delivery of chemotherapy? 	8 (1-10)	7 (5-10)	<ul style="list-style-type: none"> - Aide services or higher level of care - Transportation assistance - Community resources - Health care proxy and code discussion 	<ul style="list-style-type: none"> - 20% - 15% - 40% - 75%

In community dwelling older adults, interventions guided by CGA improve health outcomes – including prevention of disability, reduction in the risk of falls, reduction in unplanned hospitalisations and decreased nursing home admissions – providing evidence supporting the use of a multidimensional approach in older patients.⁴⁶⁻⁴⁸ Several studies have shown that the implementation of CGA and CGA-driven interventions into the clinical care of older cancer patients is feasible.⁴⁹⁻⁵² The Comprehensive Geriatric Assessment in the decision-making process in elderly patients with cancer: ELCAPA study illustrated that providing CGA information and geriatric assessment-driven interventions to oncology teams can influence treatment decisions, although outcomes from these changes were not measured.⁵⁰ Another pilot study showed that CGA affected the oncology treatment plan.⁵³ Unfortunately, there are few published randomised studies evaluating outcomes from CGA and CGA-driven interventions in older cancer patients. In a study by McCorkle et al,⁵⁴ geriatric nurse practitioners conducted CGA with cancer patients, and this led to a survival advantage of 67% in the intervention group compared with 40% in the control group. In a study by Goodwin et al, breast cancer patients in the CGA-driven interventions group were significantly more likely to return to normal functioning than the controls.⁵⁵

A conceptual model (figure 2) demonstrates how information from CGA can guide interventions and decision-making. CGA-driven interventions and/or changes in chemotherapy treatment decisions (eg. selection of regimen, dosing of chemotherapy, use of supportive care medications) could improve outcomes.

Figure 2: Conceptual model of geriatric assessment use in chemotherapy choices.



There is a great need for randomised studies to evaluate CGA and CGA-driven interventions for improving decisions for cancer treatment and for improving outcomes. At this stage, there is no consensus on how to best incorporate CGA-driven interventions into oncology care. Two studies are ongoing, which will utilise expert opinion to develop a consensus of geriatric assessment and geriatric assessment-driven interventions in oncology. The next necessary step would be to test whether these approaches improve outcomes in randomised studies.

Understand the impact of oncology therapeutics in the general population of older cancer patients.

Because the average age of patients enrolled on cancer clinical trials is lower than the average age of patients with the disease, and since older patients enrolled in clinical trials are generally healthier than most patients seen in practice, it is difficult to apply the results of clinical trials to patients in the general population.⁵⁶⁻⁵⁸ More data on the safety and efficacy of treatments in older patients are needed.

There are several possible reasons why older patients are under-represented in clinical trials. First, these trials often have stringent inclusion and exclusion criteria which would preclude their ability enrol, such as excluding patients with certain comorbidities, mild organ dysfunction, or a history of a past cancer, even though these issues are unlikely to affect outcomes. Second, the infrastructure - time or resources required to safely enrol older patients in studies - is not usually built into the study protocols. Therefore, it is often very difficult for older patients to travel to a tertiary care centre frequently for repeated study visits and procedures. As a research community, different structures and novel approaches to data collection, such as telemedicine, should be considered to allow for the inclusion of an appropriate proportion of older patients. Third, the majority of older adults are treated in the community, not at academic medical centres. Therefore, enrolment in clinical trials should also be more widely available in community oncology practices, where the majority of older adults with cancer are treated. Community oncology practices need to be reimbursed for the extra time and resources required to enrol and retain older patients in trials. Fourth, there is often a concern for higher toxicity in older patients, which speaks to the need for trials specifically for older patients with safety parameters and endpoints of relevance. Because of difficulties with recruitment and enrolment of older adults, only 9% of patients enrolled in registration trials were 75 years or older in FDA-registration trials.⁴⁴ This contrasts with the fact that approximately 30% of cancer patients are in this age range.

The oncology community needs to focus on developing trials where the results can be generalised to the population with the disease. The gap may only be able to be closed if multidisciplinary teams work together to design elderly-specific trials to include patients who are older and/or have other health status issues. All trials, especially trials studying therapeutics for cancers that occur commonly in older populations, should have a specific target accrual for patients aged 65 and over. These studies would provide data that are necessary for clinicians to utilise in daily practice.

Identify and test interventions to improve symptoms and maintain quality of life of older cancer patients.

In addition to including these measures as part of the baseline evaluation, longitudinal inclusion of a CGA would further our understanding of the impact of both the cancer and its treatment on geriatric outcomes such as functional status and cognition. One large population database of mostly cancer survivors showed that cancer survivors were more likely to be vulnerable, have a disability, or to have geriatric syndromes than people without a history of cancer.⁵⁹ This data suggests that cancer and/or cancer treatment could have long-term consequences on the quality of survivorship in an older patient. Endpoints should be included in clinical trials that evaluate impact of therapies on geriatric domains. This is especially important in curative intent trials, or trials for cancers with a long clinical history.

Another routine part of clinical trials is to evaluate the toxicity of the cancer therapy. Toxicity of chemotherapy is generally graded by the National Cancer Institute Common Terminology Criteria for Adverse Events.⁶⁰ Grade 3 (severe or medically significant), 4 (life-threatening) or 5 (treatment-related mortality) toxicities are typically captured and reported in clinical trials and are considered to be 'dose limiting.' Grade 2 toxicities, such as diarrhoea or neuropathy, could also significantly affect quality of life in older patients and may also be 'dose-limiting' particularly in the geriatric population. Therefore, grade 2 toxicities should be captured. Trials should also report consequences of toxicities such as health care utilisation and changes in care. Hospitalisations, rehabilitation and transitions to a higher level of care, such as assisted living or nursing home, are important outcomes to capture so that these risks can be discussed with the patient during treatment decision-making.

There are some under-studied, but important long-term symptoms of cancer and cancer treatment that can affect quality of life and should be studied. Sarcopenia is the progressive generalised loss of skeletal muscle mass, strength and function. Cachexia has no uniform definition, and is a complex metabolic syndrome associated with cancer that is characterised by weight loss >10%, reduced food intake (<1500 kcal/d) and systemic inflammation (CRP >10mg/L).⁶¹ It is estimated that 50% of people older than 80 years have sarcopenia. Half of all cancer patients lose some body weight; one third lose > 5% body weight and up to 20% of all cancer deaths are directly linked to cachexia.⁶¹ To date, no clinically applied regimen has been completely successful in reversing cancer-associated muscle or weight loss. Interventions for these issues including cachexia and sarcopenia are needed to improve the quality of survivorship for the older patient with cancer. The third conference of the CARG-NIH U13 Grant, 'Geriatric oncology research to improve clinical care,' will address this research need by bringing a multidisciplinary group of researchers together to develop a research agenda focusing on interventions for improving the quality of survivorship of older and/or frail adults with cancer.

Conclusions

New priorities in geriatric oncology research focusing on the needs of older cancer patients are necessary to meet the needs of a rapidly aging population. Older patients, caregivers and health care providers would ultimately benefit from research that improves the evidence base for oncology care in older adults. Significant current gaps in knowledge ultimately lead to wide variation in patterns of care in the treatment of older adults with cancer, potentially increasing health care burdens and costs due to both over and under-treatment of older adults with cancer. Focusing efforts on geriatric oncology research would provide a better evidence base to inform decision-making, with the ultimate goal of improving the quality of care of older adults with cancer.

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References

1. Jemal A, Siegel R, Xu J, Ward E. Cancer statistics, 2010. *CA Cancer J Clin*;60:277-300.
2. Pal SK, Hurria A. Impact of age, sex, and comorbidity on cancer therapy and disease progression. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology* 2010;28:4086-93.
3. Hutchins LF, Unger JM, Crowley JJ, Coltman CA, Jr., Albain KS. Underrepresentation of patients 65 years of age or older in cancer-treatment trials. *N Engl J Med* 1999;341:2061-7.
4. Extermann M, Hurria A. Comprehensive geriatric assessment for older patients with cancer. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology* 2007;25:1824-31.
5. Karnofsky DA, Ellison RR, Golbey RB. Selection of patients for evaluation of chemotherapeutic procedures in advanced cancer. *J Chronic Dis* 1962;15:243-9.
6. Zubrod C, Schneiderman M, Frei E. Appraisal of methods for the study of chemotherapy of cancer in man. *Journal of Chronic Diseases* 1960:7-33.
7. Albain KS, Crowley JJ, Hutchins L, Gandara D, O'Bryan RM, Von Hoff DD, et al. Predictors of survival following relapse or progression of small cell lung cancer. Southwest Oncology Group Study 8605 report and analysis of recurrent disease data base. *Cancer* 1993;72:1184-91.
8. Albain KS, Crowley JJ, LeBlanc M, Livingston RB. Survival determinants in extensive-stage non-small-cell lung cancer: the Southwest Oncology Group experience. *J Clin Oncol* 1991;9:1618-26.
9. Extermann M, Overcash J, Lyman GH, Parr J, Balducci L. Comorbidity and functional status are independent in older cancer patients. *J Clin Oncol* 1998;16:1582-7.
10. Rockwood K, Stadnyk K, MacKnight C, McDowell I, Hebert R, Hogan DB. A brief clinical instrument to classify frailty in elderly people. *Lancet* 1999;353:205-6.
11. Reuben DB, Rubenstein LV, Hirsch SH, Hays RD. Value of functional status as a predictor of mortality: results of a prospective study. *Am J Med* 1992;93:663-9.
12. Hurria A, Browner IS, Cohen HJ, Denlinger CS, deShazo M, Extermann M, et al. Senior adult oncology. *Journal of the National Comprehensive Cancer Network : JNCCN* 2012;10:162-209.
13. Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of illness in the Aged. The Index of Ad: A Standardized Measure of Biological and Psychosocial Function. *JAMA : the journal of the American Medical Association* 1963;185:914-9.
14. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *The Gerontologist* 1969;9:179-86.
15. Wedding U, Rohrig B, Klippstein A, Pientka L, Hoffken K. Age, severe comorbidity and functional impairment independently contribute to poor survival in cancer patients. *J Cancer Res Clin Oncol* 2007;133:945-50.
16. Patel KV, Peek MK, Wong R, Markides KS. Comorbidity and disability in elderly Mexican and Mexican American adults: findings from Mexico and the southwestern United States. *Journal of aging and health* 2006;18:315-29.
17. Guralnik JM, Simonsick EM, Ferrucci L, Glynn RJ, Berkman LF, Blazer DG, et al. A short physical performance battery assessing lower extremity function: association with self-reported disability and prediction of mortality and nursing home admission. *Journal of gerontology* 1994;49:M85-94.

18. Bylow K, Hemmerich J, Mohile SG, Stadler WM, Sajid S, Dale W. Obese frailty, physical performance deficits, and falls in older men with biochemical recurrence of prostate cancer on androgen deprivation therapy: a case-control study. *Urology* 2011;77:934-40.
19. Extermann M, Balducci L, Lyman GH. What threshold for adjuvant therapy in older breast cancer patients? *J Clin Oncol* 2000;18:1709-17.
20. Frasci G, Lorusso V, Panza N, Comella P, Nicoletta G, Bianco A, et al. Gemcitabine plus vinorelbine versus vinorelbine alone in elderly patients with advanced non-small-cell lung cancer. *J Clin Oncol* 2000;18:2529-36.
21. Firat S, Byhardt RW, Gore E. Comorbidity and Karnofsky performance score are independent prognostic factors in stage III non-small-cell lung cancer: an institutional analysis of patients treated on four RTOG studies. *Radiation Therapy Oncology Group. Int J Radiat Oncol Biol Phys* 2002;54:357-64.
22. Piccinillo JF, Tierney RM, Costas I, Grove L, Spitznagel EL, Jr. Prognostic importance of comorbidity in a hospital-based cancer registry. *JAMA* 2004;291:2441-7.
23. Satariano WA, Ragland DR. The effect of comorbidity on 3-year survival of women with primary breast cancer. *Ann Intern Med* 1994;120:104-10.
24. Maggiore RJ, Gross CP, Hurria A. Polypharmacy in older adults with cancer. *The oncologist* 2010;15:507-22.
25. Landi F, Zuccala G, Gambassi G, Incalzi RA, Manigrasso L, Pagano F, et al. Body mass index and mortality among older people living in the community. *J Am Geriatr Soc* 1999;47:1072-6.
26. Dewys WD, Begg C, Lavin PT, Band PR, Bennett JM, Bertino JR, et al. Prognostic effect of weight loss prior to chemotherapy in cancer patients. Eastern Cooperative Oncology Group. *Am J Med* 1980;69:491-7.
27. Vellas B, Guigoz Y, Garry PJ, Nourhashemi F, Bannahum D, Lauque S, et al. The Mini Nutritional Assessment (MNA) and its use in grading the nutritional state of elderly patients. *Nutrition* 1999;15:116-22.
28. Wadley VG, Okonkwo O, Crowe M, Ross-Meadows LA. Mild cognitive impairment and everyday function: evidence of reduced speed in performing instrumental activities of daily living. *Am J Geriatr Psychiatry* 2008;16:416-24.
29. Sauvaget C, Yamada M, Fujiwara S, Sasaki H, Mimori Y. Dementia as a predictor of functional disability: a four-year follow-up study. *Gerontology* 2002;48:226-33.
30. Dodge HH, Kadowaki T, Hayakawa T, Yamakawa M, Sekikawa A, Ueshima H. Cognitive impairment as a strong predictor of incident disability in specific ADL-IADL tasks among community-dwelling elders: the Azuchi Study. *The Gerontologist* 2005;45:222-30.
31. Hurria A, Li D, Hansen K, Patil S, Gupta R, Nelson C, et al. Distress in older patients with cancer. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology* 2009;27:4346-51.
32. Seeman TE, Berkman LF, Kohout F, Lacroix A, Glynn R, Blazer D. Intergroup variations in the association between social ties and mortality in the elderly. A comparative analysis of three communities. *Ann Epidemiol* 1993;3:325-35.
33. Kroenke CH, Kubzansky LD, Schernhammer ES, Holmes MD, Kawachi I. Social networks, social support, and survival after breast cancer diagnosis. *J Clin Oncol* 2006;24:1105-11.
34. Kornblith AB, Herndon JE, 2nd, Zuckerman E, Viscoli CM, Horwitz RJ, Cooper MR, et al. Social support as a buffer to the psychological impact of stressful life events in women with breast cancer. *Cancer* 2001;91:443-54.
35. Hurria A, Togawa K, Mohile SG, Owusu C, Klepin HD, Gross CP, et al. Predicting chemotherapy toxicity in older adults with cancer: a prospective multicenter study. *J Clin Oncol* 2011;29:3457-65.
36. Extermann M, Boler I, Reich RR, Lyman GH, Brown RH, DeFelice J, et al. Predicting the risk of chemotherapy toxicity in older patients: The Chemotherapy Risk Assessment Scale for High-Age Patients (CRASH) score. *Cancer* 2011.
37. Kanesvaran R, Li H, Koo KN, Poon D. Analysis of prognostic factors of comprehensive geriatric assessment and development of a clinical scoring system in elderly Asian patients with cancer. *J Clin Oncol* 2011;29:3620-7.
38. Giantin V, Valentini E, Iasevoli M, Falci C, Sivero P, De Luca E, et al. Does the Multidimensional Prognostic Index (MPI), based on a Comprehensive Geriatric Assessment (CGA), predict mortality in cancer patients? Results of a prospective observational trial. *Journal of Geriatric Oncology* 2013; 4: 208-217
39. Aldriks Ab A, van der Geest L, Giltay E, Cessie S, Jhanneke E.A.. Frailty and malnutrition predictive of mortality risk in older patients with advanced colorectal cancer receiving chemotherapy. *Journal of Geriatric Oncology* 2013; 4: 218-226
40. Hurria A, Cohen HJ, Extermann M. Geriatric Oncology Research in the Cooperative Groups: A Report of a SIOG Special Meeting. *Journal of geriatric oncology* 2010;1:40-4.
41. Hurria A, Cirincione CT, Muss HB, Kornblith AB, Barry W, Artz AS, et al. Implementing a geriatric assessment in cooperative group clinical cancer trials: CALGB 360401. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology* 2011;29:1290-6.
42. Pal SK, Katheria V, Hurria A. Evaluating the older patient with cancer: addressing frailty and the geriatric assessment. *CA: a cancer journal for clinicians* 2010;60:120-32.
43. Hurria A, Balducci L, Naeim A, Gross C, Mohile S, Klepin H, et al. Mentoring junior faculty in geriatric oncology: report from the Cancer and Aging Research Group. *J Clin Oncol* 2008;26:3125-7.
44. Hurria A, Mohile SG, Dale W. Research priorities in geriatric oncology: addressing the needs of an aging population. *J Natl Compr Canc Netw* 2012;10:286-8.
45. Dale W, Mohile SG, Eldadah BA, Trimble EL, Schilsky RL, Cohen HJ, et al. Biological, clinical, and psychosocial correlates at the interface of cancer and aging research. *J Natl Cancer Inst* 2012;104:581-9.
46. Cohen HJ, Feussner JR, Weinberger M, Carnes M, Hamdy RC, Hsieh F, et al. A controlled trial of inpatient and outpatient geriatric evaluation and management. *N Engl J Med* 2002;346:905-12.
47. Stuck AE, Siu AL, Wieland GD, Adams J, Rubenstein LZ. Comprehensive geriatric assessment: a meta-analysis of controlled trials. *Lancet* 1993;342:1032-6.
48. Stuck AE, Aronow HU, Steiner A, Alessi CA, Büla CJ, Gold MN, et al. A trial of annual in-home comprehensive geriatric assessments for elderly people living in the community. *N Engl J Med* 1995;333:1184-9.
49. Rao AV, Hsieh F, Feussner JR, Cohen HJ. Geriatric evaluation and management units in the care of the frail elderly cancer patient. *J Gerontol A Biol Sci Med Sci* 2005;60:798-803.
50. Caillet P, Canoui-Poitrine F, Vouriot J, Berle M, Reinald N, Krypciak S, et al. Comprehensive geriatric assessment in the decision-making process in elderly patients with cancer: ELCAPA study. *J Clin Oncol* 2011;29:3636-42.
51. Ingram SS, Seo PH, Martell RE, Clipp EC, Doyle ME, Montana GS, et al. Comprehensive assessment of the elderly cancer patient: the feasibility of self-report methodology. *J Clin Oncol* 2002;20:770-5.
52. Hurria A, Gupta S, Zauderer M, Zuckerman EL, Cohen HJ, Muss H, et al. Developing a cancer-specific geriatric assessment: a feasibility study. *Cancer* 2005;104:1998-2005.
53. Horgan AM, Leigh NB, Coate L, Liu G, Palepu P, Knox JJ, et al. Impact and Feasibility of a Comprehensive Geriatric Assessment in the Oncology Setting: A Pilot Study. *Am J Clin Oncol* 2011.
54. McCorkle R, Strumpf NE, Nuamah IF, Adler DC, Cooley ME, Jepson C, et al. A specialized home care intervention improves survival among older post-surgical cancer patients. *J Am Geriatr Soc* 2000;48:1707-13.
55. Goodwin JS, Satish S, Anderson ET, Nattinger AB, Freeman JL. Effect of nurse case management on the treatment of older women with breast cancer. *J Am Geriatr Soc* 2003;51:1252-9.
56. Hutchins LF, Unger JM, Crowley JJ, Coltman CA, Jr., Albain KS. Underrepresentation of patients 65 years of age or older in cancer-treatment trials. *The New England journal of medicine* 1999;341:2061-7.
57. Yee KW, Pater JL, Pho L, Zee B, Siu LL. Enrollment of older patients in cancer treatment trials in Canada: why is age a barrier? *J Clin Oncol* 2003;21:1618-23.
58. Talarico L, Chen G, Pazzdur R. Enrollment of elderly patients in clinical trials for cancer drug registration: a 7-year experience by the US Food and Drug Administration. *J Clin Oncol* 2004;22:4626-31.
59. Mohile SG, Xian Y, Dale W, Fisher SG, Rodin M, Morrow GR, et al. Association of a cancer diagnosis with vulnerability and frailty in older Medicare beneficiaries. *Journal of the National Cancer Institute* 2009;101:1206-15.
60. Yesavage JA. Geriatric Depression Scale. *Psychopharmacology bulletin* 1988;24:709-11.
61. Fearon K, Strasser F, Anker SD, Bosaeus I, Bruera E, Fainsinger RL, et al. Definition and classification of cancer cachexia: an international consensus. *Lancet Oncol* 2011;12:489-95.

ROLE OF PRIMARY CARE IN BETTER SUPPORTING OLDER PEOPLE WITH CANCER

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Abstract

Most people who become ill with cancer are over 60 years old, and the incidence rate will increase as the population ages. The role of general practice and primary care will become greater with time, as limits of the abilities of specialist cancer and palliative care services to provide care for all will be tested. There are challenges in determining how to integrate specialist and generalist services. Caring for older persons with cancer requires consideration of the whole person – a perspective that is routine for general practice and primary care. This contextual knowledge could be very valuable in planning cancer treatment. In particular, the patient's aims for treatment, physical and cognitive state, and social circumstances have to be taken into account. The care for carers, who will often have their own medical problems in addition to the burden of care, could be a first step in engaging general practice/primary care routinely into cancer care.

The developed world is growing older. In 2006, 13% of Australia's population was over 65. This is projected to be over 26% by 2051.¹ While the population is living longer than ever before, it is also inevitable that people will become ill and die. In the next 50 years, the proportion of people of retirement age will grow to levels where existing social and health infrastructure will simply not be able to manage the demand for services. As a society, we need to become far smarter at delivering health care that is primed to meet the challenge. Effective health care coordination will be crucial.² At the core of these changes has to be a vibrant primary care sector.

Ninety per cent of Australia's population visits a general practitioner (GP) every year.³ While Australia's health system already promotes general practice as the lynchpin for chronic disease management,⁴ the size of the problem means that the primary care system has to continue to evolve in order to readily meet the challenge. Cancer in older people poses particular challenges.

Demographics and illness distribution

As people grow older, the burden of illness increases. In 2012, most cancers were diagnosed in people over the age of 60 – 75% for men and 65% for women.⁵ The commonest non-cutaneous cancers are – prostate, bowel, melanoma and lung in men and breast, bowel, melanoma and lung in women.⁵

In addition to cancer, older people are very likely to suffer from multiple conditions, and to be taking multiple treatments. Furthermore, the proportion of people who become more frail with time increases, and frailty itself causes the greatest proportion of death in those over 70.⁶ Frailty is a condition of reduced physiologic reserve and dysregulation of multiple physiologic systems, which produces a high risk of vulnerability for adverse health outcomes.⁷ Cognitive decline is a reality for many, and

dementia for a substantial number of older people. The proportion of people with cognitive impairment increases exponentially with age.⁸ This brings with it risks of poor self-care, including inadequate nutrition, difficulties with compliance with medicine and a reduced awareness of what may be happening to the body. The consequences are considerable – medication misadventures, slower healing and an inability to exercise properly, to name a few.

Cancer in older persons – similar but different

Cancer in older people involves the same biological processes as in the young, but the consequences of the ageing process mean that the physiological and social context in which cancer occurs plays a dominant part in determining how best to manage it. Patient choice is paramount, and close communication between primary care providers and the patient and close relatives is essential. There are many evidence-based tools to assist people to communicate their needs and desires.⁹

Most older people prefer symptom control over curative intent in cancer treatment.¹⁰ The ageing process will determine how the body can withstand what are often challenging treatment processes. The physiological reserves of the body decline with age, so the ability to withstand treatment similarly declines, and even without comorbid disease, may preclude some therapies. Further, comorbid diseases add insult to bodies with slowly but steadily declining reserves.

In addition to the biomedical considerations of age, the rigours of treatment – multiple trips to hospital for chemotherapy and radiation therapy, may be an insurmountable burden for some. It may be that treatments that can be administered on a daily basis at home are preferable, even if the chance of cure is less likely. Available social support structures also need to be considered.

The role of the GP

Prevention

Prevention can be considered in terms of preventing cancer, and in maintaining optimal health as age progresses. Healthy patients have more cancer treatment options available to them. It is essential to encourage preventive measures as early as possible, and promote healthy habits in exercise, nutrition and social interaction to minimise the risk of declining general health. Habits of a lifetime are hard to break, and if people are not used to an active lifestyle, or have indulged in harmful habits over many years, it is very difficult to introduce healthy behaviours in the latter years of life. Cancer prevention activities should be started early and continue through life. These include stopping smoking, appropriate diet, safe levels of alcohol consumption and sun protection.¹¹

Early detection

It is possible to detect common cancers early. This applies in particular to breast and cervical cancer in women and bowel cancer in both sexes. Screening for breast cancer should start at 50, and regular mammography be conducted biennially until the age of 69. Similarly, pap smears should continue for women who have been sexually active until the age of 69.¹¹ Faecal occult blood testing to detect bowel cancer should be conducted every two years from age 50-75 if all tests are negative, and lifelong in those with any positive test.^{11,12} Australia has a national bowel cancer screening program which offers free five yearly faecal occult blood testing from ages 50 to 65.¹³

Treatment

In most cases, GPs will not have a major role in the active primary treatment of cancers, but there is potential to have significant roles in cancer treatment care.¹⁴ They can facilitate referral to the appropriate service in a timely way.¹⁵ GPs can facilitate the oncology team's decision-making process easily by ensuring that all relevant pathology and radiology is ordered and completed well before the treating team is consulted. Further, they should play a role in determining treatment, because of their knowledge of the patient's health and social circumstances. Their input should be considered in the multidisciplinary team's decision-making process. Treatment decisions made by disease-based multidisciplinary teams are considered best practice, with positive impacts on treatment outcomes.¹⁶ However, these specialist multidisciplinary teams have struggled to work out where GPs actually fit in.

Many GPs have contextual knowledge of their patients, their health status and their family that has taken years to build. Their contribution has the potential to make a substantial impact on cancer treatment decisions. This is particularly the case in older patients where the whole context is critical in deciding whether to treat, and if treatment is contemplated, to what extent.

Further, they could be given the responsibility for the care of the primary caregiver. Carers' issues are frequently acknowledged, but because of resource constraints,

cancer centres find it is very difficult to identify and manage their issues and concerns arising from the patient's cancer. Indeed, the act of caring can be exhausting and can directly impact on the ability of carers to continue the care of very ill people. Formalising this role for GPs could be a major advance for the management of the whole situation.¹⁷

This rationale for engaging GPs in multidisciplinary teams is not questioned, but how to action this is challenging. GP participation in multidisciplinary case conferences are supported by Medicare, and do influence patient outcomes and service utilisation in the palliative care setting.^{18,19} Different models of actioning participation of GPs have been tried, notably using videoconferencing and teleconferences. Evidence of similar impact in the cancer setting has not yet been generated.

Post-treatment surveillance

Discharge from treatment can be a fraught process for patients.²⁰ Many patients feel a keen loss of a very supportive structure when they are discharged. The processes to return to a 'pre-cancer' life have not been considered till recently, when the issues surrounding 'survivorship' have received serious consideration. Central in this is the importance of resuming the need to pay attention to normal health issues. In older people, this includes the need to maintain the care of comorbid conditions. Periodic cancer checks need preparation, and this can be a role facilitated by the GP. Particularly in regional and rural areas, much post treatment surveillance can be done locally, so long as there is good communication between the treatment team and the GP.¹⁵ Much unnecessary travel, time and expense can be prevented by forethought and communication.

Advance care planning is a process where patients, close relatives and their medical advisors anticipate health needs that may arise in the future.²¹ These are recorded in Advance Health Directives, which are legally binding documents that allow the patient's wishes to be respected. In addition, they record the appointment of a health advocate, who can make decisions on behalf of the patient. Each state in Australia has similar but not identical processes. All legislation allows for patient wishes to be overridden in the cases where preferred treatment options are futile. Such decisions would be made in conjunction with the patient's health advocate.

One of the most challenging aspects of medical care is breaking the news that cancer has progressed and cure is not possible. In order to assist the patient to make this choice, a 'benefit-burden' assessment should be undertaken by the patient and his/her medical advisors (box 1).²² The benefits of successful treatment are obvious. However, the burdens for older people can be formidable. The GP can be a key person in guiding the person through this assessment. Once decisions are made, from time to time the GP will be called upon to convey treatment decisions back to the specialist team. Thus the advocacy role of the GP is both one of advising other team members, and of interpreting the advice of specialist colleagues back to the patient.

Box 1: Benefit vs burden analysis of pursuing active treatment for older people.

BENEFITS

- Possible extension of time to complete essential life tasks
- Long-term improvement in targeted symptoms
- Improved functions capacity
- Maintain long-term control over own life

BURDENS

- Short-term transfer of control to medical professionals
- Adverse treatment effects
- Time, effort and monetary costs - treatment, transport, accommodation, foregone income (younger carers)
- Opportunity costs - time spent in treatment not spent at home, socially, work (younger carers)

Palliative care

About three quarters of GPs express willingness to be involved in palliative care with their patients.^{23,24} This is a given part of the role of general practice in rural and regional areas. Increasingly though, patients in urban areas are referred to specialist palliative care services directly from oncology services, and GPs may find themselves marginalised.¹⁵ This may concentrate end of life cancer care on already overstretched services. Again, processes like case conferences may allow shared care to take place. The best results will occur when tasks of care are negotiated and allocated. Again, this means negotiation and time. However, the long-term benefit of this is likely to be more efficient care.²⁵

Needs based palliative care has been advocated in recent years. Needs based care is the care that patients are provided by the service most suited to the intensity of their needs.²⁶ For many, their needs can be perfectly managed in primary care. There may be times when care requires consultation by palliative care services and the care can still be provided at the community level. Perhaps a period of inpatient care to stabilise a problem may be needed. However, a small proportion of patients will require far more intense care, or complex symptom problems need high levels of multidisciplinary and specialist input. Importantly, people can move in and out of different levels of need (figure 1).²⁷ An instrument which allows an objective assessment of the level of need has been devised and tested.²⁶ It can be used at regular intervals by any health professional, and takes a couple of minutes to complete and does improve patient outcomes.

General practitioners as treatment advocates for older people

When cancer is diagnosed in older people, appropriate treatment is required. The problem here is determining what ‘appropriate’ means in the context of older people. Here GPs have to make judgments about the health of the person, and make it clear to the treatment team what the patient’s normal health state is. What are the morbidities the person already has? What will be the person’s capacity to withstand what are often challenging treatment regimes? What treatments is the patient already taking? What social supports are in place? What is the health of the spouse and their ability to provide care if advanced illness is in place?

It may be that the person is fully capable of undertaking curative treatment for their disease. However, it is also possible that the burden of comorbid diseases and the patient’s goals of care should lead to modifications in cancer treatment. The aims of treatment need to be conveyed to the patient. Ultimately, decisions about how treatment will be undertaken will be made by the patient and his or her support network. This must be an informed choice.

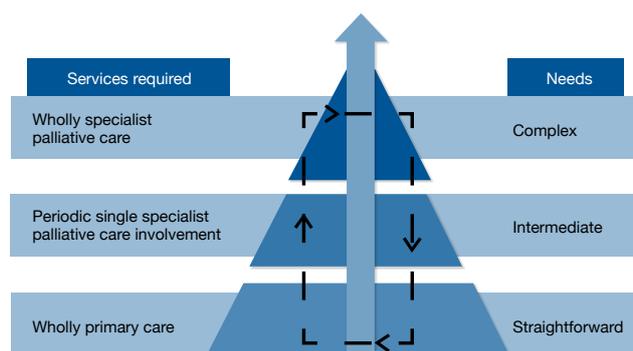
Medical therapies and ageing

Cancer and its symptomatic sequelae frequently require powerful therapies. It is not in the scope of this article to consider these in detail. However, it is relevant to consider how the ageing process can alter the way therapies are used.

Treatment regimes can be complex. In the presence of cognitive decline, safeguards have to be instituted that minimise the risk of confusion. Use treatments that require once or at most twice daily administration for preference. Additionally, impaired vision may make reading labels impossible. Interventions that include blister packaging and cognitive support, and those that provide education about medicine use can be effective.²⁸ Make use of dispensing strategies that minimise the risk of confusion. Consider supervision of treatment by a responsible carer, or where there is none, domiciliary nursing services.

Chronic kidney disease can develop insidiously, and early stages of chronic kidney disease are common in older people.²⁹ Since many drugs used in cancer and palliative care are excreted renally, there is a major risk of toxicity in the presence of unrecognised renal impairment.

Figure 1: Needs based palliative care model.



Irreversible causes of impaired renal function include vascular disease, hypertension and diabetic nephropathy. Renal function is reversibly affected by a number of problems in older age. In particular, drugs such as non-steroidal anti-inflammatory drugs, diuretics and other anti-hypertensives (especially angiotensin converting enzyme inhibitors and angiotensin receptor blockers), the so-called 'triple whammy',²⁹ together with dehydration, can seriously reduce renal function. Attention paid to these risk factors will reduce the risk of adverse events.

Approximately one in three older people in the community taking five or more medicines will suffer an adverse drug reaction within 12 months, and many of these will be hospitalised.³⁰ Many of these episodes are preventable. Cancer and palliative care therapies add far more medicines, and the risk rises accordingly. The benefit versus the risk of each therapy needs to be carefully considered. Critical review of medicines is essential. Consider the overall aims of treatment for the patient. For cancer, that goal may be cure. In the palliative care setting, the aim is comfort and potentiating function. What is the potential for benefit of each medicine, including the time until that benefit is manifested? Balance this against the potential for short-term and long-term harm.³¹ Can one medicine have an impact on more than one condition? Long-term preventive agents like cholesterol lowering agents and even low dose antiplatelet agents should be considered for withdrawal.

Conclusion

Cancer care in older people has to be influenced by the patient's physical and mental state, their psychosocial supports and their life goals. General practice can play a pivotal role in the successful management of older people with cancer. GPs have multiple roles in this setting. Finding ways to bring GPs into the formal care of cancer patients should offer improved outcomes, adding their contextual knowledge to the disease based knowledge of specialist colleagues. Further, GPs are in an excellent position to be the designated care provider for the carer of older persons with cancer. Overcoming the technical barriers to involvement of GPs in multidisciplinary decision-making is a priority.

References

1. Australian Bureau of Statistics. Australian Social Trends. <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4102.02007>. 2007.
2. Rechel B, Doyle Y, Grundy E, McKee M. How can health systems respond to population ageing? Copenhagen: World Health Organization, 2009 Policy Brief 10.
3. Britt H, Miller GC, Charles J, Henderson J, Bayram C, Pan Y, et al. General practice activity in Australia 2010–11. Sydney: Sydney University Press, 2011.
4. Department of Health and Ageing. Chronic Disease Management (CDM) Medicare Items: Department of Health and ageing; 2013 [cited 2013 9/5/2013]. Available from: <http://www.health.gov.au/internet/main/publishing.nsf/Content/mbsprimarycare-chronicdiseasemanagement>.
5. Australian Institute of Health and Welfare & Australasian Association of Cancer Registries. Cancer in Australia; an overview, 2012. Canberra: AIHW, 2012 CAN 70.
6. Gill TM, Gahbauer EA, Han L, Allore HG. Trajectories of disability in the last year of life. *N Engl J Med*. 2010 Apr 1;362(13):1173-80.
7. Fried LP, Ferrucci L, Darer J, Williamson JD, Anderson G. Untangling the concepts of disability, frailty, and comorbidity: implications for improved targeting and care. *J Gerontol A Biol Sci Med Sci*. 2004 Mar;59(3):255-63.
8. Katz MJ, Lipton RB, Hall CB, Zimmerman ME, Sanders AE, Verghese J, et al. Age-specific and sex-specific prevalence and incidence of mild cognitive impairment, dementia, and Alzheimer dementia in blacks and whites: a report from the Einstein Aging Study. *Alzheimer disease and associated disorders*. 2012 Oct-Dec;26(4):335-43.
9. Gaston CM, Mitchell G. Information giving and decision-making in patients with advanced cancer: A systematic review. *Soc Sci Med*. 2005 Nov;61(10):2252-64.
10. Somogyi-Zalud E, Zhong Z, Hamel MB, Lynn J. The use of life-sustaining treatments in hospitalized persons aged 80 and older. *J Am Geriatr Soc*. 2002 May;50(5):930-4.
11. RACGP. Guidelines for preventive activities in general practice: 8th edition. South Melbourne: Royal Australian College of General Practitioners, 2012.
12. Australian Cancer Network Colorectal Cancer Guidelines Revision Committee. Guidelines for the prevention, early detection and management of colorectal cancer. Sydney: Cancer Council Australia and Australian Cancer Network, 2005.
13. Department of Health and Ageing. National Bowel Cancer Screening Program 2013 [cited 2013 May 10]. Available from: <http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/bowel-about>.
14. Mitchell GK. The role of general practice in cancer care. *Aust Fam Physician*. 2008 Sep;37(9):698-702.
15. Mitchell GK, Burrige LH, Colquist SP, Love A. General Practitioners' perceptions of their role in cancer care and factors which influence this role. *Health Soc Care Community*. 2012 Nov;20(6):607-16.
16. CanNET National Support and Evaluation Service - Siggins Miller. Managed Clinical Networks – a literature review. Canberra: Cancer Australia, 2008.
17. Mitchell G, Girgis A, Jiwa M, Sibbritt D, Burrige L. A GP Caregiver Needs Toolkit versus usual care in the management of the needs of caregivers of patients with advanced cancer: a randomized controlled trial. *Trials*. 2010;11:115.
18. Abernethy AP CD, Shelby-James T, Rowett D, May F, Samsa GP, Hunt R, et al. Delivery Strategies to Optimize Resource Utilization and Performance Status for Patients. Advanced Life-Limiting Illness: Results From the "Palliative Care Trial" [ISRCTN81117481]. *J Pain Symptom Manage*. 2013;45(3):488-505.
19. Mitchell GK, Del Mar CB, O'Rourke PK, Clavarino AM. Do case conferences between general practitioners and specialist palliative care services improve quality of life? A randomised controlled trial (ISRCTN 52269003). *Palliat Med*. 2008 Dec;22(8):904-12.
20. Murray SA, Kendall M, Grant E, Boyd K, Barclay S, Sheikh A. Patterns of social, psychological, and spiritual decline toward the end of life in lung cancer and heart failure. *J Pain Symptom Manage*. 2007 Oct;34(4):393-402.
21. National Advance Care Directives Working Group. A national framework for Advance Care Directives. Canberra: Australian Health Ministers Advisory Council, 2011.
22. Mitchell G, Currow D. Chemotherapy and radiotherapy. When to call it quits. *Aust Fam Physician*. 2002;31(2):129-33.
23. Rhee J, Zwar N, Vagholkar S, Dennis S, Broadbent A, Mitchell G. Attitudes and barriers to involvement in Palliative Care by Australian urban General Practitioners. *J Pall Med*. 2007;11:980-5.
24. Reymond E, Mitchell G, McGrath B, Welch D. Research into the educational, training and support needs of General practitioners in palliative care. Report to the Commonwealth of Australia. Brisbane: Mt Olivet Health Services, 2003 9 May 2003.
25. Tieman J, Mitchell G, Shelby-James T, Currow D, Fazekas B, O'Doherty L, et al. Integration, Coordination and Multidisciplinary Care: What can these approaches offer to Australian Primary Health Care? *Aust J Primary Health*. 2007;13(2):56-65.
26. Waller A, Girgis A, Johnson C, Lecathelinais C, Sibbritt D, Forstner D, et al. Improving outcomes for people with progressive cancer: interrupted time series trial of a needs assessment intervention. *J Pain Symptom Manage*. 2012 Mar;43(3):569-81.
27. Palliative Care Australia. Palliative care service provision in Australia: a planning guide. Canberra: Palliative Care Australia, 2003.
28. Banning M. A review of interventions used to improve adherence to medication in older people. *Int J Nurs Stud*. 2009 Nov;46(11):1505-15.
29. Kidney Health Australia. Chronic Kidney Disease (CKD) management in general practice (Second Edition). Melbourne: Kinley Health Australia, 2012.
30. Scott IA, Gray LC, Martin JH, Pillans PI, Mitchell CA. Deciding when to stop: towards evidence-based deprescribing of drugs in older populations. Evidence-based medicine. 2012 Nov 7. ePub ahead of print.
31. Stevenson J, Abernethy AP, Miller C, Currow DC. 2004. 329:909-912. Managing co-morbidities in patients at the end of life. *Brit Med J*. 2004;329:909-12.

CARE OF OLDER PEOPLE LIVING WITH CANCER: THE ROLE OF THE SPECIALIST NURSE AND ALLIED HEALTH PROFESSIONALS

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Abstract

Older people with cancer have unique physiological, psychological and social needs. This article has identified several key actions that can readily be integrated into existing cancer care services to improve care outcomes for older people referred for cancer treatment, namely: embedding an integrated assessment into the initial visit to ensure early identification of symptoms and unmet needs; monitoring the effectiveness of cancer treatment and changing needs; optimising function through early and appropriate referral; maintaining GP contact; ensuring the provision of well-coordinated care; addressing psychosocial, emotional and financial needs; and minimising caregiver burden.

Emotional distress, lack of social support and medical issues are just some of the many issues faced by the older person living with cancer. As the population ages and the number of older people diagnosed with cancer increases, the challenge for the health care system is how it will adequately identify, address and manage this population's physical, psychological and social needs, as well as those of their caregivers, many of whom are also older. Having recognised this unmet need, a number of large international and national cancer services have developed geriatric oncology programs. While many cancer care services may aspire to develop these specialist programs, the reality is that few will have the capacity. Yet, there are practical steps cancer care services can implement today to ensure that the needs of older people with cancer are better addressed. This article provides insights into the nursing and allied health interventions that can be readily integrated into usual cancer care practices to address priority concerns for older people recently diagnosed with cancer and their caregivers.

Cancer is predominately a disease of older people. Many older people present with more advanced cancer and have comorbidities and pre-existing limitations over multiple domains which impact on their functional ability, nutritional status, cognitive function and emotional wellbeing.¹ In the US, unmet emotional support needs, caregiver burden, transportation issues and the need for in-home assistance are frequently cited concerns of older people living with cancer.² In Australia, similar concerns have been identified across all age groups, with only 40% of cancer patients and even fewer carers perceiving that they had received the services they required to improve their psychological wellbeing, including coping with stress, anger, depression, isolation and uncertainty.³ Despite there being increasing recognition that older people with cancer have unique care needs, the research focus has been on screening and assessment issues, as opposed to proactively addressing unmet practical and psychosocial support needs.⁴

In a small number of larger Australian cancer care centres the unique needs of older people with cancer are being addressed through the establishment of designated geriatric oncology programs and advanced geriatric oncology medical and nursing positions. In addition to the tailored supportive care offered by these services, the establishment of designated geriatric oncology roles enables these clinicians to have input into multidisciplinary meetings, ward consultations and ad hoc inquiries, as well as undertake research and provide clinician education. While it is acknowledged that not all centres will have the capacity or the need to create designated geriatric-oncology services, there are opportunities within the existing system to strengthen the care provided to older people with cancer and their caregivers. This article provides insights into the nursing and allied health interventions that can be readily integrated into usual cancer care practices to address priority concerns for older people recently diagnosed with cancer and their caregivers.

Continuous assessment and monitoring

Both the US National Comprehensive Cancer Network and the International Society of Geriatric Oncology recommend that some form of geriatric assessment is integral to optimising cancer care for an older population.^{5,6} Despite this recommendation, debate regarding what constitutes the best form of geriatric assessment for older people referred for cancer treatment continues. While there is currently little consensus as to what the optimal geriatric oncology assessment should look like, there is agreement that the gold standard Comprehensive Geriatric Assessment (CGA) is of little benefit to the older person and their caregivers if identified issues are not addressed. The CGA was originally designed to predict functional decline and falls in an older population with cognitive and functional impairments. A CGA helps assess the unmet supportive care needs and other interventions required to optimise the health and wellbeing

of the older person and their caregivers. In an ideal world, undertaking a geriatric assessment to inform appropriate cancer treatments, timely identification and addressing of areas of concern, and ongoing integrated and coordinated care, would be incorporated into usual care for older people diagnosed with cancer.

In the non-cancer population, utilising a formalised assessment process to identify an older people's unmet needs and putting in place appropriate multi-disciplinary interventions is not a new concept.⁷ There is evidence that screening, assessment and targeted follow-up care for older people, that combines physical, psycho-educational and psychosocial intervention, increases survival and reduces unplanned hospital presentations. In a large cohort (n=739) of older Australians aged over 75 years presenting to an emergency department, an intervention involving an initial assessment of functional and mental status, combined with a home visit within 24 hours, development of a care plan, activation of interventions and referrals, resulted in significantly lower rates of admission to hospital during the first 30 days after the initial emergency department visit. There were also lower rates of emergency admissions in the 18-month follow-up period and a longer time to first emergency admission.⁷

Similarly, a nursing-led intervention involving comprehensive clinical assessment, monitoring and skills training for older post-surgical cancer patients (n=375), implemented during three home visits and five telephone contacts over a four week period, also resulted in improved overall survival.⁸ In patients with advanced disease, the two year survival in the intervention group was 66.7%, compared with the control where it was 39.6% ($p < 0.05$).⁸ This randomised control trial was the first to link nursing interventions to improved survival for older people with cancer in the post-operative recovery period.⁸ Improved survival and hospital avoidance are not only desired by older people, but are important measures of health economic outcome improvement, as well as being indicators of coordinated care.

Care coordination

While traditionally, the delivery of cancer services has been primarily hospital-based, there has been greater emphasis on the provision of multidisciplinary care in the community setting. This shift has increased the need for improved communication and coordination, and has coincided with the establishment of cancer care coordinators across Australia. These coordinators, along with specialist cancer nurses, play a central role in promoting continuity of care, ensuring that patients don't feel isolated and know how to navigate their way through the system and across care settings in order to access the care they require in a timely manner.

Specialist cancer nurses are also ideally placed to ensure that older people and their caregiver(s) understand the importance of the GP continuing to be involved in the older person's medical management, especially their chronic disease management, as well as their ongoing cancer care.⁹ However, to be effective in this role, GPs need complete and timely information from the treating cancer team,

clinical information as well as social information, including an overview of the information provided to patients and their relatives about their illness covering side-effects of treatment, rehabilitation, prognosis, and role of the family.¹⁰

Cancer care coordination for an older population frequently involves many long face-to-face conversations with patients and their caregivers. The treatment decision-making process for older cancer patients is complex and requires multi-dimensional assessments to classify the patient's fitness for chemotherapy and to determine an appropriate treatment plan.¹¹ It also requires provision of evidence-based information to the person with cancer, so they can make informed decisions about their capacity to tolerate the proposed treatment and the implications of such treatment on their long-term health and well-being. These conversations often involve the translation and layering of information previously provided by other clinicians. Older people frequently struggle to fully comprehend the rationale for various treatments, especially adjuvant therapy.¹² Cancer care nurses play a crucial role in ensuring older patients and their caregivers understand the implications of these treatment recommendations.

Older people also require self-care management strategies, provision of emotional support, practical coordination and information about multiple appointments. Providing effective care to older people often requires greater liaison with a larger number of health professionals who are involved in the management of the older person's care, such as the aged care assessment team, the general practitioner, community nurses and other chronic and complex illnesses specialist nurses or care teams.

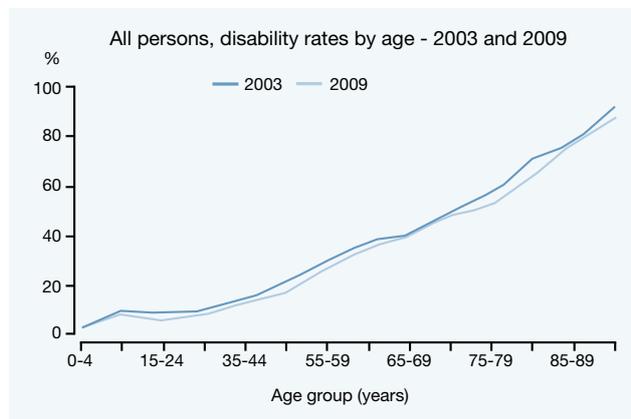
Emotional support

Many older people experience social isolation and financial hardship and require psychosocial support related to cancer treatment decision-making, coping with their illness in general, as well as treatment.¹³ An early social work referral is often indicated if a lack of social supports and access to practical support is found to be a determining factor for older people declining or withdrawing from treatment.¹⁴ While transportation challenges are not confined to the older population, it is a frequently cited concern for older patients and their caregivers, who themselves are often elderly. Providing transport and parking assistance, including access to disability parking, allows older people who are still driving to retain some of their independence and relieves the burden on caregivers in a physical and financial sense. Older patients from rural and remote areas face more difficulties in accessing specialist care in terms of transportation and timely referral.¹³

Optimising function

Disability increases steeply with age (figure 1). It has been estimated that 48% of all newly diagnosed older cancer patients have performance limitations as measured by activities of daily living (ADL), compared to 40% of the overall elderly population.¹⁵ The administration of systemic cancer treatment to older people increases the likelihood of further functional decline.¹⁵

Figure 1: ABS level of disability increases with age.¹⁶



An older person's instrumental activities of daily living (IADL) score prior to the commencement of cancer treatment is predictive of outcomes, with independence associated with higher quality of life and improved overall survival, and dependence linked to higher risk of chemotherapy related toxicities.¹⁷ Making functional status one of the strongest predictors of overall survival in the geriatric cancer population.¹⁷

Previous research has identified that while older people desire active treatment aimed at prolonging their life, they also want to optimise their functional ability and quality of life.¹³ A study involving a cohort of older women with metastatic breast cancer identified that the greatest remedial effects could be gained if appropriate interventions were provided as soon as ADL deficits were identified.¹⁸ Assessing and monitoring older cancer patients' functional capabilities requires the introduction of systems and processes that can continuously monitor and respond to these changes. Given the increasing numbers of older Australians diagnosed with cancer, this is a potentially onerous task for a sole practitioner. However, geriatric oncology nurses, or tumour stream specific nurses, are ideally placed to undertake the geriatric screening, assessment and monitoring role.

A specialist cancer nurse, being visible at the point of care and having the capacity to work across the acute and ambulatory cancer care settings, ensures that older cancer patients are appropriately assessed, the necessary interventions implemented in a timely manner and ongoing monitoring provided. While providing direct and indirect clinical nursing expertise, the strength of these specialist roles lies in the nurse's capacity to engage on a needs basis with other multi-disciplinary team members, including the general practitioner. Assisting the older person and their caregiver(s) to navigate the health care system and access the care and supports required to optimise care outcomes is an essential element of the specialist cancer nurse role.

Occupational therapists are invaluable in promoting optimal function in personal and instrumental ADLs, by adapting task or improving the capacity of the person to perform.¹⁹ Being aware of an older person's pre-treatment level of function and arranging occupational therapy input as soon as functional decline is experienced, helps optimise the older person's functional capacity. While previous research has

demonstrated functional impacts of cancer and age related comorbid conditions, there is limited evidence surrounding the exact impact that chemotherapy has on patient function in specific ADL. Having systems in place to continually assess the older person's evolving need for practical support is crucial, as their functional abilities rarely improve during their cancer journey.²⁰ An intervention commonly arranged by specialised nurses and allied health professionals is referral to in-house allied health professions or community-based services. These community based state and government funded schemes provide vital practical assistance that allow older people to access supportive interventions such as allied health services (podiatry, physiotherapy and occupational therapy), domestic help (cleaning, washing and shopping), personal care (showering and dressing) and home modifications that assist safe mobilisation. Accessing these services frees caregivers up to attend to other tasks.

Nutritional concerns regarding the older person with cancer is both common and multi-factorial.²¹ It requires early interventions that involve assessments of obvious deficits as seen in cancer of the upper gastrointestinal tract and head and neck cancers, evaluation of oral health and dentition, swallowing ability, a review of impacting co-morbid conditions, medication review, psychosocial support and cognition. In the instance of weight loss, a referral to a dietitian is commonly recommended, as halting this decline is complex and often requires expert skill and intervention. Another area of expert intervention is the field of pharmacology, in particular the challenging area of treatment individualisation, careful use of supportive agents such as anti-emetics and haematological growth factors, knowledge regarding potential drug interactions and poly-pharmacy and medication rationalisation.^{22,23} The co-existence of various chronic medical conditions also makes the treatment and management of cancer and treatment-related effects more complex, with diminished organ function increasing the risk of toxicities and adverse effects from poly-pharmacy.^{22,23}

When discussing care options and treatment plans, it is important to be mindful of the impact hearing and vision impairment have on communication, and the impact of advancing age on health literacy.²⁴ Identifying and minimising the impact of these aged related factors is particularly relevant in the context of older people needing to implement various treatment and symptom management self-management strategies at home, ranging from adherence to oral chemotherapy regimens, mouth care and being vigilant and attending to febrile episodes. The complexity of many of these self-management regimens demands the active engagement and input of older peoples' caregivers and their inclusion in patient education sessions.

Caregiver input and support

Ensuring that caregivers receive the information they require is critical to them being able to support the older person with cancer. Australian carers report not receiving all of the information they need to care for the person receiving cancer treatment, not feeling more than half didn't feel informed enough to know how to deal with side-effects of treatment or the patient's overall health.²⁵ In geriatric oncology, caregiver input, along with the patients preference, is crucial

to determining the goals of care and devising an optimal treatment plan.²⁶

The caregiver role is a complex task that may have physical and mental repercussions.^{27,28} Increasingly care-giving responsibility is falling to people aged 65 years and older. The impact of having an older caregiver is amplified if they too have health issues and/or a disability.²⁹ Being the caregiver of an older person with cancer is not only physically demanding, but has an emotional toll.³⁰ Several studies suggest that the spouse caregiver of the older patient with cancer may be at even higher risk for depression than the patient.^{31,32} A caregiver's health status, age, patient's symptoms and functional ability (ADLS and IADLS) have all been associated with caregivers of older people newly diagnosed with cancer experiencing depression.^{32,33} Being mindful of the age of carers is crucial, as are the demands on a caregiver's free personal time, their changing social roles, the potential for a decline in their physical and mental wellbeing and strains on financial resources. A recent age and gender matched study exploring coping and distress among spouse caregivers to older cancer patients, found that men utilise less active coping strategies than women.²⁸ It is important for clinicians to tailor recommendations and interventions that assist caregivers with gender preferences incorporated.³⁴

If the caregiver is also employed, they may need to spend time away from work, especially if the patient requires assistance with IADLS, which has financial implications.³⁰ In addition to providing practical assistance and emotional support, clinicians can improve the caregiver experience for those caring for older people living with cancer through: improved communication; better coordination of the patient, clinicians and caregivers schedules; and better symptom and medication management education.³⁰ Early identification of older people with increased needs will help reduce caregiver burden and reduce the potentially detrimental effects of care giving.

References

- To THM, Okera M, Prouse J, Prowse RJ, Singhal N. Infancy of an Australian geriatric oncology program—characteristics of the first 200 patients. *J Geriatr Oncol.* 2010;1(2):81-86.
- Lynch MP, Marcone D, Kagan SH. Developing a multidisciplinary geriatric oncology program in a community cancer center. *Clin J Oncol Nurse.* 2007;11(6):929-933.
- Cancer Service Networks National Demonstration Program (CanNET). Assessment of cancer care perceptions and experiences of people affected by cancer: Australian Government; 2010.
- Tremblay D, Charlebois K, Terret C, Joannette S, Latreille J. 2012; Integrated oncogeriatric approach: a systematic review of the literature using concept analysis. *BMJ open.* 2(6).
- National Comprehensive Cancer Network. Senior Adult Oncology 2013.
- Extermann M, Aapro M, Audisio R, Balducci L, Droz J, Steer C, et al. Main priorities for the development of geriatric oncology: a worldwide expert perspective. *J Geriatr Oncol.* 2011;2(4):270-273.
- Caplan GA, Williams AJ, Daly B, Abraham K. A randomized, controlled trial of comprehensive geriatric assessment and multidisciplinary intervention after discharge of elderly from the emergency department—the DEED II study. *J Am Geriatr Soc.* 2004;52(9):1417-1423.
- McCorkle R, Strumpf NE, Nuamah IF, Adler DC, Cooley ME, Jepson C, et al. A specialized home care intervention improves survival among older post-surgical cancer patients. *J Am Geriatr Soc.* 2000;48(12):1707-1713.
- Mitchell G. The role of the general practice in cancer care. *Aust Fam Physician* 2008;37(9):698-702.
- Rowlands S, Callen J, Westbrook JI. Are General Practitioners getting the information they need from hospitals to manage their lung cancer patients? A qualitative exploration. *Health Inf Manage.* 2012;41(2):4-13.
- Massa E, Madeddu C, Astaro G, Pisano M, Spiga C, Tanca FM, et al. An attempt to correlate a "Multidimensional Geriatric Assessment" (MGA), treatment assignment and clinical outcome in elderly cancer patients: Results of a phase II open study. *Crit Rev Oncol Hematol.* 2008;66(1):75-83.
- Johnson M. Chemotherapy treatment decision making by professionals and older patients with cancer: a narrative review of the literature. *Eur J Cancer Care (Engl).* 2012;21(1):3-9.
- Chouliara Z, Kearney N, Stott D, Molassiotis A, Miller M. Perceptions of older people with cancer of information, decision making and treatment: a systematic review of selected literature. *Annals of Oncology.* 2004;15(11):1596-1602.
- Bailey C, Corner J, Addington-Hall J, Kumar D, Nelson M, Haviland J. Treatment decisions in older patients with colorectal cancer: the role of age and multidimensional function. *Eur J Cancer Care (Engl).* 2003;12(3):257-262.
- Esbensen BA, Østerlind K, Roer O, Hallberg IR. Quality of life of elderly persons with newly diagnosed cancer. *Eur J Cancer Care (Engl).* 2004;13(5):443-453.
- Australian Bureau of Statistics. Disability, Ageing and Carers Australia: Summary of findings 2011.
- Schubert CC, Gross C, Hurria A. Functional assessment of the older patient with cancer. *Oncology.* 2008;22(5):916-922.
- Cheville AL, Troxel AB, Basford JR, Kornblith AB. Prevalence and treatment patterns of physical impairments in patients with metastatic breast cancer. *J Clin Oncol.* 2008;26(16):2621-2629.
- Townsend E. 2002. Preface 2002 to Enabling Occupation: an Occupational Therapy Perspective: *Can J Occup Ther.*
- Puts MTE, Hardt J, Monette J, Girre V, Springall E, Alibhai SMH. Changes in functional status in older newly-diagnosed cancer patients during cancer treatment: A six-month follow-up period. Results of a prospective pilot study. *J Geriatr Oncol.* 2011;2(2):112-120.
- Chernoff R. Nutritional Care of the Older Adult with Cancer. In: Cope D, Reb A, eds. *An evidence-Based Approach to the Treatment and Care of the Older Adult with Cancer.* Pittsburgh, USA: Oncology Nurses Society; 2006: 391-396
- Lichtman SM, Wildiers H, Chatelut E, Steer C, Budman D, Morrison VA, et al. International Society of Geriatric Oncology Chemotherapy Taskforce: Evaluation of Chemotherapy in Older Patients—An Analysis of the Medical Literature. *J Clin Oncol.* 2007;25(14):1832-1843.
- Wildiers J, Aapro M. Pharmacology and unique side effects of chemotherapy in older adults In: Hurria A, Cohen J, eds. *Practical Geriatric Oncology.* USA: Cambridge University Press; 2010: 18-31.
- Zamora H, Clingerman EM. Health literacy among older adults: a systematic literature review. *J Gerontol Nurs.* 2011;37(10):41-51.
- Cancer Australia. Assessment of cancer care perceptions and experiences of people affected by cancer. Canberra: Cancer Australia 2010.
- Ellingson LL. The roles of companions in geriatric patient—interdisciplinary oncology team interactions. *J Aging Stud.* 2002;16(4):361-382.
- Braun M, Mikulincer M, Rydall A, Walsh A, Rodin G. Hidden Morbidity in Cancer: Spouse Caregivers. *J Clin Oncol.* 2007;25(30):4829-4834.
- Goldzweig G, Merims S, Ganon R, Peretz T, Baider L. Coping and distress among spouse caregivers to older patients with cancer: An intricate path. *J Geriatr Oncol.* 2012;3(4):376-385.
- Australian Bureau Of Statistics. A profile of carers in Australia. Canberra 14 October 2008.
- Jayani R, Hurria A. Caregivers of Older Adults With Cancer. *Semin Oncol Nurs.* 2012; 28(4):221-225.
- Carter PA, Acton GJ. Personality and coping: predictors of depression and sleep problems among caregivers of individuals who have cancer. *J Gerontol Nurs.* 2006;32(2):45.
- Doorenbos AZ, Given B, Given CW, et al. The influence of end-of-life cancer care on caregivers. *Res Nurs Health.* 2007;30(3):270-281.
- Schumacher KL, Stewart BJ, Archbold PG, Caparro M, Mutale F, Agrawal S. Effects of caregiving demand, mutuality, and preparedness on family caregiver outcomes during cancer treatment. *Oncology Nursing Forum* 2008;35(1):45-56.
- Given B, Given CW. Cancer Treatment in Older Adults: Implications for Psychosocial Research. *J Am Geriatr Soc.* 2009; 57:283-285.

MANAGEMENT OF POLYPHARMACY IN OLDER CANCER PATIENTS

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Abstract

Many older people newly diagnosed with cancer are taking medications for comorbid conditions, or as primary or secondary disease prophylaxis. The commencement of chemotherapy and the introduction of associated medications to treat symptoms or prevent toxicity necessitate identification and management of polypharmacy. Polypharmacy refers to the use of multiple medications. This article describes a four step approach to manage polypharmacy in the ambulatory cancer care setting. Step 1 - identifying all of the medications a patient is taking including prescribed, self-prescribed, over the counter and/or complementary medicines. Step 2 - checking for potentially inappropriate medications. Step 3 - checking for drug interactions. Step 4 - considering de-prescribing. A multi-disciplinary team approach is key to managing polypharmacy in older cancer patients.

Cancer is more common in older than younger Australians.¹ In 2009, 73.5% of new cancer cases diagnosed in men were in those aged 60 years and over, and 63.6% in women of the same age group. Many older people are medically fit before being diagnosed with cancer; however others have chronic medical conditions such as hypertension, cardiovascular disease, diabetes, osteoarthritis etc. These comorbid conditions can impact on prognosis and treatment tolerability in people diagnosed with cancer. An additional consideration is the medications, prescribed by their general practitioner (GP) or other specialists, which they are already taking.² Cancer patients may also use over the counter medicines and complementary and alternative medicines (CAM), including herbal or other supplements which they may or may not mention to their doctor. Starting cancer chemotherapy with combination intravenous cytotoxic drugs, or oral 'targeted' agents, and additional supportive medications to prevent side-effects or manage symptoms, can lead to patients taking multiple medications, which is referred to as polypharmacy.²

There are a number of definitions for 'polypharmacy'. One numerical definition is a patient taking five or more different medications,³ although others set this number at four or six medications. It is notable that this definition does not take into account 'pill burden' or number of different doses being taken each day. Others define polypharmacy more broadly as occurring when a patient is taking more drugs than are clinically indicated, taking unintended therapeutically duplicate medications, or taking potentially inappropriate medicines.^{2,3} Perhaps more important than having an exact definition is to understand what effect polypharmacy might have on an individual cancer patient.

Incidence of polypharmacy in cancer patients

Attention has recently turned towards polypharmacy issues in older cancer patients with the publication of several studies.²⁻⁴ The first 200 newly diagnosed cancer

patients aged 70 years assessed at an Australian geriatric oncology clinic were taking a mean of five medications (range 0 to 18) before they started chemotherapy.⁴ A cross-sectional study of 117 patients aged >65 years in US outpatient oncology clinics took 7.3 ± 3.4 medications,³ range (0–18), comprising 5.6 ± 3.1 prescribed medications, range (0–14) and 1.7 ± 1.6 non-prescribed medications, range (0–6). In this study, the prevalence of polypharmacy and potentially inappropriate medicines use was 80% and 41% respectively, with the odds of using potentially inappropriate medicines increasing by 18% for each increase in additional medication. These results indicate that polypharmacy in cancer patients is an issue of concern that needs to be considered and managed by the treating team.

Problems associated with polypharmacy

Polypharmacy and use of potentially inappropriate medicines in older people increase the incidence of adverse drug reactions, which is defined as 'the unintended noxious response to one or more drugs'.²⁻⁶ More than half of a sample of 100 patient with metastasis cancer taking medication for comorbid disease reported side-effects, including dizziness and postural hypotension, muscular aches, bruising, indigestion and/or reflux.⁷ In frail elderly patients, functionality is frequently affected by adverse drug effects which commonly include anticholinergic symptoms, changes in mental status, mood and behaviour and GI tract disturbances (constipation or diarrhoea).⁸ Undesirable health outcomes of polypharmacy have included confusion, poor adherence, delirium, impaired balance leading to falls, fractures, adverse drug reaction related hospitalisation, nursing home placement and even death.^{6,9} In older cancer populations, polypharmacy may be associated with general functional decline, but also geriatric syndromes such as urinary incontinence, cognitive impairment or falls.⁵

There is rising clinical concern about the potential for drug-drug interactions as polypharmacy increases, which is amplified in older cancer patients who may already have age-related changes in drug pharmacokinetics, such as altered absorption, and renal and hepatic dysfunction.^{2,3,5,10} The outcomes of drug-drug interactions can range from theoretical changes in the bioavailability of one or both drugs, with no clinical significance or requirement to change dose or drug, to hospital admission and potentially life threatening events.^{2,10} For example, a retrospective review identified 21 cancer patients started on oral capecitabine who were already taking the coumarin anticoagulant, warfarin.¹¹ Bleeding requiring hospital admission and/or transfusion occurred in four of the patients.¹¹

Warfarin is frequently used for primary or secondary stroke prevention in older people, as well as for clotting disorders that are not uncommonly associated with cancer. This interaction is likely due to inhibition of cytochrome P450 (CYP450) 2C9 by capecitabine and/or its metabolites.¹² Patients taking warfarin who start capecitabine should be monitored regularly for alterations in their coagulation parameters and warfarin dose adjusted as required.¹²

Recently, interest has focused on the escalating use of oral 'targeted' agents for treating a number of cancers and the potential impact on drug interactions in this population. A retrospective review of nine targeted agents (dasatinib, erlotinib, everolimus, imatinib, lapatinib, nilotinib, pazopanib, sorafenib and sunitinib), all of which are commonly used in Australia, found that the incidence of co-prescribing of potentially interacting drugs was high.¹³ While this study identified the number of patients exposed to potential drug interactions, it was not designed to determine how many, if any, patients actually experienced a clinically significant interaction.¹³ However, the results certainly raised concern, and illustrate the importance of clinicians being vigilant for interacting drugs when prescribing oral cancer therapy.

Drug-drug interactions are not limited to prescribed medications. Use of certain over-the-counter and CAM has led to serious interactions with chemotherapy.^{2,14,15} Cancer patients in general, but also older cancer patients, have been found to take a range of different CAM, including agents which have multiple effects on the CYP450-mediated and P-glycoprotein-mediated metabolic pathways, such as garlic and ginkgo.^{14,15} St John's wort, also a CYP450 3A inducer, may be self-prescribed by patients, including those with cancer, for depression.^{2,15} If it is taken with irinotecan or imatinib, St John's wort can reduce the anti-cancer effect of both drugs, with the potential to adversely influence treatment outcome.^{2,15}

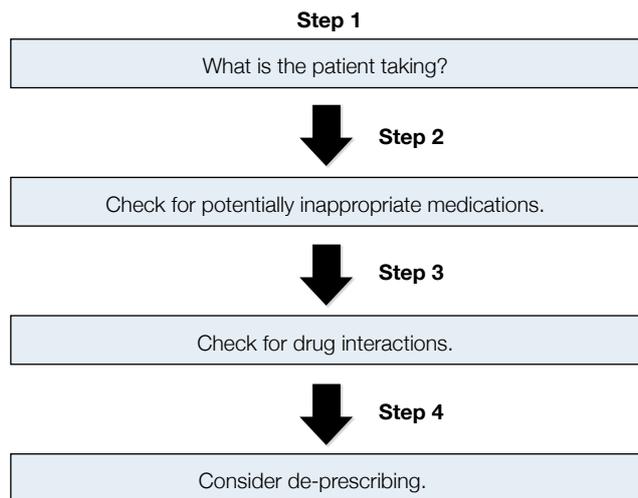
Patient adherence to a prescribed treatment is affected by the number of medications a person is taking, as well as the complexity of the regimen.^{5,6,7}

Increased healthcare costs include cost of supply of inappropriate or duplicate medications, additional patient monitoring that may be required and emergency department visits or hospitalisation due to serious adverse events, or as a result of unexpected drug interactions.²

Tackling polypharmacy

There are many interventions that have been aimed at improving appropriate polypharmacy including educational program for prescribers, organisational interventions such as pharmacist led medication review services or specialist clinics, clinical decision support systems, and risk screening tools.⁶ For the purposes of this article, a stepwise care pathway is suggested (figure 1).

Figure 1: Polypharmacy care pathway



Step 1: Identify all of the medications a patient is taking

The need for effective communication between all of a patient's healthcare providers, including his or her GP, is essential to accurately determine a patient's medications and document in his or her cancer care medical record. To ensure the treating team are fully aware of all medications that a newly referred cancer patient is taking before chemotherapy or supportive medication is prescribed, a comprehensive medication history is essential.² A medication list generated by the patient's GP is a useful starting point, however clinicians need to be mindful that these lists may not reflect actual medication usage, recent verbal drug or dose changes, and are very unlikely to list all of the patient's over the counter or CAMs. While most patients admitted to public hospitals in Australia have a medication history conducted by a pharmacist within a set time of hospital admission, this may not be the case in ambulatory clinics where cancer patients are most commonly treated. They deserve the same attention from the pharmacist, which might require communication with the patient's community pharmacy or GP. Some cancer centres have a comprehensive medication history interview with a pharmacist built into pre-chemotherapy appointments, but this is not always the norm. The medication history can be facilitated by the use of the so-called 'brown bag' technique, where the patient brings all of their medicines with them for review.² Other methods that have been found useful in the literature, include providing patients with checklists of common prescription and/or non-prescription drugs, vitamins and supplements that they can complete before their initial cancer assessment and planning interview.^{2,15}

Electronic medical records used in some clinics in a US study were found to be significantly more complete for prescribed medicines (83%) than those using paper records (69%).¹⁵ However, the percentage of recorded non-prescription medicines and other preparations patients were taking was very low.¹⁵ Currently in Australia, and many other countries, there is no connection between dispensing databases kept in community pharmacies, where most patients' medicines are dispensed, and those used by the hospital pharmacy, chemotherapy infusion centre or the oncology electronic chemotherapy prescribing system used by the oncologist/haematologist (where that is in place). It remains to be seen how the linkage of data between various systems progresses in future.

Step 2: Checking for potentially inappropriate medications

The National Comprehensive Cancer Network Senior Adult Oncology Guidelines recommend that medication review for duplication and appropriate use should be performed at every visit.⁵ Several tools for identifying potentially inappropriate medicines in older patients have been described.¹⁶ The well-known Beers criteria were developed in the US in 1991 and have been most recently revised by the American Geriatrics Society.^{16,17} This list of inappropriate medications includes drugs with a long half-life, with side-effects such as sedation or anticholinergic effects, known high risk medications when safer alternatives exist, ineffective drugs, doses of drugs that should not be exceeded, and drug-disease and drug-drug interactions that should be avoided.³ The drug classes (table 1) that could be targeted for discontinuation in collaboration with the patient's primary care provider include tricyclic antidepressants, sedating antihistamines, long acting benzodiazepines associated with increased sedation, analgesics containing dextropropoxyphene or tramadol, and some non-steroidal anti-inflammatory drugs such as indomethacin.² However, the applicability of this de-prescribing regimen to Australian cancer patients has not been determined at this stage, especially as many of the drugs listed are not currently used in this country.

Table 1: Drug classes considered for discontinuation in older cancer patients.

Drug class	Reason for considering discontinuation
Tricyclic antidepressants	Strong anticholinergic and sedating properties.
Long acting benzodiazepines	Long T _{1/2} in elderly (often several days) - prolonged sedation and increased risk of falls and fractures.
Sedating antihistamines	Increased risk of falls and fractures.
Analgesics containing dextropropoxyphene	No added benefit but added CNS side-effects and increased risk of falls and fractures.
Some NSAIDs including indomethacin	Highest incidence of CNS effects.

NSAIDs = non-steroidal anti-inflammatory drugs; T _{1/2} = half life; CNS = central nervous system

Other tools that may be helpful include the Medication Appropriateness Index,¹⁸ and the STOPP (The Screening Tool of Older Persons' Potentially Inappropriate Prescriptions) tool.¹⁹ STOPP was developed in Ireland by a multidisciplinary team including geriatricians, primary care physicians, pharmacists and others. Although not yet applied to the older cancer patient setting, STOPP includes 65 indicators mostly relating to drug-drug and drug-disease interactions that highlight falls risk.¹⁹ In the cancer setting, a group of oncologists developed their own classification of unnecessary medications based on whether or not there was a clear medical indication for continuing use to treat co-morbid conditions in patients (n=87) with advanced cancer, some of whom were on chemotherapy.²⁰ The potentially unnecessary medications included statins, anti-hypertensives, anti-diabetics and gastric protectants. This six month prospective study found 21 patients (24%, 95% CI 15.6-34.5%) were taking at least one unnecessary medication, with the most common being gastric protective agents for which there was no clear indication in 11 patients.²⁰ A Prescribing Indicators Tool was developed specifically for elderly Australians, however not those with cancer.²¹ The tool has 48 indicators, including: 18 which concern avoidance of medications in a specific disease; 19 for recommended treatment; four indicate monitoring is required; three concern specific drug interactions; and the last four are single indicators - drug interactions, drug changes in past 90 days, smoking and vaccination status.²¹ The feasibility of using the prescribing indicators tool with older cancer patients and its effectiveness is yet to be demonstrated.

The National Comprehensive Cancer Network guidelines more simply advise special considerations for over or underuse, duration of therapy and dosage when using the following classes of medications: benzodiazepines, anticholinergics; antipsychotics; opioids and corticosteroids, all of which may well be required in older cancer patients.⁵ While tools for determining inappropriate medications now exist, their application in older cancer patients is far from standard practice.

Step 3: Checking for drug interactions

There are numerous resources that can be used by busy clinicians to check for drug interactions, ranging from standard textbooks which vary in frequency of updating, to point-of-care online resources, including some specifically for checking CAM interactions.² Interaction checkers are also built in to many electronic prescribing or dispensing systems, but they are of varying accuracy. If they are not providing clinically significant information and importantly, useful management advice, the information provided by these checkers can lead to 'alert fatigue'.² The tiering of alerts to show only those with the potential for serious outcome is one possible solution to address this.² Not all drug-drug interactions require therapy changes, but clinicians need to be aware of any potential problems to allow additional monitoring to be implemented.

Checking chemotherapy prescriptions for potential drug-drug interactions with the patient's concomitant medications is one of the standard components of medication therapy management in cancer patients.²² In a prospective study involving pharmacists in a cancer

centre in Singapore, a process was adopted that included: a comprehensive medication review to identify, resolve and prevent medication-related problems; formulating a medication treatment plan; selecting, initiating, modifying, or administering medication therapy; providing verbal education to enhance patient adherence; and communicating essential information to the patient's other primary care providers.²² Drug interactions were the most common drug related problem seen in about 30% of patients. This study supports the team approach to managing older cancer patients.

Step 4: De-prescribing

Medications identified by the methods described above as being unnecessary, inappropriate, or potentially harmful can be considered for discontinuation or so called 'de-prescribing'.²³ While this may take place on an informal basis between oncologists and their older cancer patients in Australia, there do not appear to be any specifically cancer-related publications to assist the oncologist or the cancer team with this process. Taking established methods from the geriatric patient setting, such steps will most likely include assessing the patient including their frailty and life expectancy, determining and discussing goals with the patient and/or carer and then reviewing, assessing and optimising medications, as outlined in step 2 above.²³ At this stage, the discussion about ceasing unneeded medications can begin in a structured way, in collaboration with the patient, their family or carer as appropriate, and GP.^{2,23}

Conclusions

Polypharmacy is a growing concern for clinicians involved in managing older cancer patients. Not all of the medications an older cancer patient is taking need to be ceased before starting chemotherapy, as many are appropriately prescribed to manage their co-morbid conditions. However, it is important that the treating team is aware of every medication the patient is taking to ensure safe application of the selected chemotherapy without harm resulting from adverse effects or drug interactions. Ideally, a medication therapy management service should be available to all our older cancer patients to facilitate the process. The systematic application of the four step approach is recommended for adoption by multidisciplinary cancer care teams to minimise the adverse effects of polypharmacy in older cancer patients.²

References

1. Cancer Australia website (<http://cancer australia.gov.au/>) accessed 25/2/13
2. Lees J, Chan A. Polypharmacy in the elderly cancer patient: clinical implications and management. *Lancet Oncol* 2011;12:1249-57.
3. Prithviraj GK, Koroukian S, Margevicius S, Berger NA, Bagar R, Owusu C. Patient characteristics associated with polypharmacy and inappropriate prescribing of medications among older adults with cancer. *J Geriatr Oncol* 2012;3:228-37.
4. To THM, Okera M, Prouse J, Prowse RJ, Singhal N. Infancy of an Australian geriatric oncology program - characteristics of the first 200 patients. *J Geriatr Oncol* 2010;1:81-86.
5. NCCN Clinical practice Guidelines in Oncology. Senior Adult Oncology Version 1.2014. (http://www.nccn.org/professionals/physician_gls/_guidelines.asp#senior accessed 26/08/13)
6. Patterson SM, Hughes C, Kerse N, Cardwell CR, Bradley MC. Interventions to improve the appropriate use of polypharmacy for older people. *Cochrane Database Syst Rev* 2012(5) Art. No.: CD008165.
7. Cashman J, Wright J, Ring A. The treatment of co-morbidities in older patients with metastatic cancer. *Support Care Cancer* 2010;18:651-5.
8. Wooten JM. Pharmacotherapy considerations in elderly adults. *South Med J* 2012;105:437-45.
9. Hilmer SN, Gnjdjic D. The effects of polypharmacy in older adults. *Clin Pharmacol Ther* 2009;85:86-8 and Suppl tables 1.
10. Doan J, Zakrzewski-Jakubiak H, Roy J, Turgeon J, Tannenbaum C. Prevalence and risk of potential cytochrome p450-mediated drug-drug interactions in older hospitalized patients with polypharmacy. *Ann Pharmacother* 2013;47:324-32.
11. Shah HR, Ledbetter L, Diasio R, Saif MW. A retrospective study of coagulation abnormalities in patients receiving concomitant capecitabine and warfarin. *Clin Colorectal Cancer* 2006;5:354-8.
12. Mims online Accessed 26/03/13.
13. Bowlin SJ, Xia F, Wang W, Robinson KD, Stanek EJ. Twelve-month frequency of drug-metabolizing enzyme and transporter-based drug-drug interaction potential in patients receiving oral enzyme-targeted kinase inhibitor antineoplastic agents. *Mayo Clin Proc* 2013;88:139-48.
14. Maggiore RJ, Gross CP, Togawa K, Tew WP, Mohile SG, Owusu C et al on behalf of the Cancer and Aging Research Group. Use of complementary medications among older adults with cancer. *Cancer* 2012;118:4815-23.
15. Hanigan MH, dela Cruz BL, Shord SS, Medina PJ, Fazili J, Thompson DM. Optimizing chemotherapy: concomitant medication lists. *Clin Pharmacol Therapeutics* 2011;89:114-9.
16. Gokula M, Holmes HM. Tools to Reduce Polypharmacy. *Clin Geriatr Med*. 2012; 28:323-41.
17. Beers MH, Ouslander JG, Rollingher I, Reuben DB, Brooks J, Beck JC. Explicit criteria for determining inappropriate medication use in nursing home residents. UCLA Division of Geriatric Medicine. *Arch Intern Med* 1991;151(9):1825-32.
18. Samsa GP, Hanlon JT, Schmadre KE, Weinberger M, Clipp EC, Uttech KM et al. A summated score for the medication appropriateness index: development and assessment of clinimetric properties including content validity. *J Clin Epidemiol* 1994;47(8):891-96.
19. Gallagher P, Ryan C, Byrne S, Kennedy J, O'Mahony D. STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment). Consensus validation. *Int J Clin Pharmacol Ther* 2008;46(2):72-83.
20. Fede A, Miranda M, Antonangelo D, Trevizan L, Schaffhausser H, Hamermesz B et al. Use of unnecessary medications by patients with advanced cancer: cross-sectional survey. *Support Care Cancer*. 2011; 19:1313-8.
21. Basger BJ, Chen TF, Moles RJ. Inappropriate medication use and prescribing indicators in elderly Australians. Development of a prescribing indicators tool. *Drugs Aging* 2008;25:777-93.
22. Yeah TT, Si P, Chew L. The impact of medication therapy management in older oncology patients. *Support Care Cancer* 2013;21:1287-1293.
23. Hilmer SN, Gnjdjic D, LeCouteur DG. Thinking through the medication list: Appropriate prescribing and deprescribing in robust and frail older patients. *Aust Fam Physician* 2012;12:924-8.

UNDERSTANDING NUTRITIONAL ISSUES IN THE OLDER PERSON WITH CANCER

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Abstract

The prevalence of malnutrition in both older people and those with cancer is high. Risk of malnutrition is compounded in the oncogeriatric population arising from the overlap of both age-related and cancer - induced aetiologies, leaving the older person particularly susceptible to the detrimental sequelae of disease and treatment-related morbidity. National evidence-based guidelines recommend implementation of routine malnutrition screening to identify at risk patients and facilitate early access to dietitians with expertise in nutritional management of this patient group for comprehensive nutritional assessment, intervention and monitoring. The multidisciplinary team can play a proactive role in addressing the nutritional needs of this group as part of comprehensive cancer care and improve patient-centred, clinical and cost outcomes.

In Australia in 2012, approximately 75% of new cancer cases were diagnosed in males, and 65% in females, aged 60 years and over.¹ There is some evidence to suggest that the gaps in knowledge about older peoples' responses to cancer treatment result in dose-reduced chemotherapy,² or suboptimal anticancer treatment relative to current guidelines.^{3,4} The rising life expectancy of the general population and longer survival after a diagnosis with cancer, suggest that all cancer clinicians require knowledge and expertise in managing the oncogeriatric population.

Nutritional issues in the older person with cancer

Pathophysiology of aging and nutritional concerns

Aging is characterised by a decline in organ function, including loss of lean muscle mass (sarcopenia) and/or bone mineral density, in conjunction with a reduced capacity to adapt to environmental changes arising from deficits in homeostatic mechanisms.⁵ The resultant physical frailty is compounded further by changes in cognitive function, mental health and socioeconomic status. Progressive decline in organ function will ultimately induce functional impairment and finally disability.

The pathophysiology of sarcopenia is complex, although has been described as the loss of muscle mass and muscle strength that is associated with aging.⁶ 'Anorexia of aging' describes the loss of appetite and resulting reduction in dietary intake that can occur with increasing age.⁷ Cancer cachexia is also multifaceted and has historically lacked an agreed definition. A recent international consensus document has defined cancer cachexia as a multifactorial syndrome defined by an ongoing loss of

skeletal muscle mass (with or without loss of fat mass) that cannot be fully reversed by conventional nutritional support and leads to progressive functional impairment.⁸ Its pathophysiology is characterised by a negative protein and energy balance, driven by a variable combination of reduced food intake and abnormal metabolism. However, even if patients were observed to maintain reasonable oral intake, they are still likely to experience unintentional weight loss, predominantly from fat free mass, indicating this complex proinflammatory cytokine-mediated syndrome is more metabolic than caloric in origin and hence requires multifaceted management. Cancer cachexia must therefore be distinguished from other forms of muscle depletion, in particular age-related sarcopenia.

Malnutrition

Malnutrition can be defined as inadequate nutritional intake and/or increased nutritional requirements that results in negative clinical outcomes.⁹ Anorexia of aging, cachexia and/or the effects of the tumour, and side-effects of treatment can all increase the risk of developing malnutrition. Malnutrition is common in cancer patients and risk is higher among those who are older and/or treated with chemoradiation.¹⁰ Age is a non-modifiable risk factor for becoming malnourished.¹¹ While any elderly patient with cancer is at nutritional risk, those at highest nutritional risk have gastrointestinal or head and neck cancers.¹²⁻¹⁴ Inpatients who are malnourished or who have a poor dietary intake are at greater risk of increased length of hospital stay, treatment related morbidity and mortality after adjustment for disease type and severity.¹⁵ Malnutrition risk was frequent (53%) in 175 patients aged over 65 years undergoing chemotherapy, associated with impaired functionality and cognition, which negatively

influenced their ability to complete planned intensive chemotherapy.¹⁶ The influence of nutritional status on postoperative morbidity and mortality has also been well documented, with undernutrition recognised as an independent risk factor for the increased incidence of complications, mortality, length of hospital stay and costs.^{17,18}

Malnutrition is both a cause and consequence of ill health across health care settings. Malnutrition can occur in the older person with cancer due to one or more of the following:

- decreased oral intake due to swallowing or dentition problems, impaired functional capacity, reduced appetite, depression, polypharmacy and/or illness.¹⁹
- an acute care hospital admission with resultant deterioration in nutritional status.
- presence of symptoms which impact on nutritional status as a result of: the patient's tumour, particularly head and neck or upper gastrointestinal cancer; their anticancer treatment, especially emetogenic chemotherapy or radiation fields that include the head and neck or oesophagus; excessive alcohol intake; sensory deficits; dysphagia; and social isolation, dementia, delirium, depression and destitution in the vulnerable elderly population.

A diagnosis of cancer in an older person can superimpose disease-related sequelae upon pre-existing comorbidities. As such, comprehensive screening and thorough assessment by the multidisciplinary team is essential to both determine appropriate medical treatment and facilitate earlier intervention for management of potentially treatable conditions such as malnutrition. A Comprehensive Geriatric Assessment can help determine the fitness of an older person for treatment after potential vulnerabilities have been identified through screening.²⁰

Understanding nutritional risk versus nutritional status

Malnutrition screening and nutritional assessment

Nutritional risk should be recognised as distinct from nutritional status, as even individuals who are determined to be well-nourished, and even obese at initial presentation, may be at high risk of decline in nutritional status during the course of treatment or with disease progression. Australian evidence-based practice guidelines recommend that ideally, all oncology patients should be screened for malnutrition and that formal nutritional assessment be performed on high-risk patients, using tools validated in the oncology population.^{21,22}

Malnutrition screening is a quick and simple process used by the multidisciplinary team to identify patients at risk of malnutrition who require comprehensive nutritional assessment by a trained clinician with nutrition expertise. Malnutrition screening is considered an essential component of comprehensive cancer care and should be undertaken at initial presentation in both ambulatory and inpatient settings, with rescreening performed at regular intervals throughout the trajectory

of care. One such tool is the Malnutrition Screening Tool (MST) that can be easily implemented to identify patients at nutritional risk.²³

It consists of two questions related to recent unintentional weight loss and poor intake because of a decreased appetite. The MST provides a score between 0-5, with patients considered to be at risk of malnutrition if they score ≥ 2 . It has been validated in a range of settings and is one of the simplest malnutrition screens; it can be completed by administrative staff or the patient themselves.

Nutritional assessment is a comprehensive approach to clinically determine an individual's nutritional status and identify nutrition-related problems. This involves analysis and interpretation of a range of parameters and data, including medical diagnoses, treatment plan, medication history, physical examination through anthropometric measures, nutritional biochemistry, psycho-social factors and dietary intake history. Detailed assessment of nutritional status is important because malnutrition is not always obvious. For example, an obese patient may still exhibit signs of nutritional compromise with severely depleted lean muscle mass and poor micronutrient status. Use of biochemical indices, such as albumin in isolation, as a proxy measure of nutritional status, is no longer accepted as adequate to accurately determine nutritional status and should not be considered a surrogate for a thorough clinical nutritional assessment.^{24,25} It is important to measure and record regular body weights, as it is not always apparent when someone is losing weight. Due to kyphosis, a higher healthy weight (or Body Mass Index) is acceptable for older adults, with a lower cut off of 22 or 24kg/m², typically used to define underweight as compared to a BMI of <18.5kg/m² in patients <65 years. However, the presence of oedema in a proportion of cancer patients, especially older patients, confounds interpretation of weight status and that is why comprehensive assessment tools as described below are the preferred method of nutritional assessment.

Several validated nutritional assessment tools are suitable for use in the elderly person with cancer. The Subjective Global Assessment (SGA),²⁶ yields a global rating that classifies nutritional status as: well-nourished (SGA A); moderate or suspected malnutrition (SGA B); or severely malnourished (SGA C). Adapted from the SGA, the scored Patient-Generated Subjective Global Assessment (scored PG-SGA)²⁷ yields both the categorical global rating and an additional continuous component relating to the severity of nutrition-impact symptoms. While both tools are validated for use in the oncology patient population (including elderly) and are recommended by current evidence-based practice guidelines, the scored PG-SGA includes a more comprehensive range of nutrition impact symptoms and tends to be more sensitive to measurable change over shorter periods of time.

Both a screening and assessment tool, the Mini-Nutritional Assessment (MNA) has been developed and

cross-validated for use in a broad spectrum of elderly populations, including hospitalised, frail housebound and the active elderly.²⁸ On a scale of 0-30, this tool yields a score with the following categories: normal nutritional status (24-30 points); at risk of malnutrition (17-23.5 points); or malnourished (<17 points). While validated for use in the elderly population, little research has been undertaken validating use of the MNA in the cancer population. In comparing the MNA with the scored PG-SGA in diagnosing malnutrition, Australian investigators determined that the MNA demonstrated high sensitivity (97%), however only moderate specificity (54%).²⁹ A similar finding was observed when comparing the two instruments in the elderly (> 65 years), with researchers concluding misclassification may have been attributable, in part, to scoring of questions relating to polypharmacy and the number of full meals consumed per day, which may not take into account characteristics typically seen in oncology patients. Therefore, the SGA and PG-SGA tools have the further advantage of being validated in all adults with cancer (ie. both those above and below 65 years of age) and also across health care settings that aids staff use of the tools and documentation and communication between settings.

Nutrition support options

The early identification and management of older people demonstrating compromised nutritional status is paramount, particularly in those undergoing multimodal treatment regimens in neoadjuvant, definitive, or adjuvant settings, as they are more likely to experience greater nutrition-impact symptoms. Improved treatment and patient outcomes have been demonstrated with appropriate nutrition intervention. Nutrition support options typically include food fortification, oral nutrition support with specialised medical nutrition therapy formula, and initiating supplementary tube feeding or total parenteral nutrition when appropriate. Each nutrition support modality has specific indications, with selection of the most appropriate method best determined on an individualised basis by a specialist dietitian in consultation with the patient, family and treating team. Evidence-based practice guidelines for the nutritional management of the patient with cancer highlight the strength of evidence with regards to nutrition support options and particular cancer types and/or treatment. There is strong evidence that early and ongoing dietary counselling (eg. by a dietitian), with or without the use of high energy-protein nutritional supplements, improves dietary intake and results in less weight loss and better quality of life. Patients requiring palliative care also necessitate special consideration, as choice and suitability of nutrition support options may vary according to where the patient is on the care pathway, in order to remain aligned with overall management goals and optimise quality of life.

Role of the multidisciplinary team in nutrition care

Comprehensive nutritional care of all patients undergoing cancer treatment involves collaboration

by all members of the multidisciplinary team to ensure positive patient outcomes are achieved. As there is now a body of strong evidence to support the role of nutrition care in cancer treatment, it is important that all members of the multidisciplinary team are aware of their potential contribution in addressing nutrition issues.³¹ Patients should be encouraged to regard nutrition care as a key component of their treatment. A positive nutrition focus with reinforcement from multiple team members has been shown to substantially increase dietary intake and improve outcomes such as quality of life in the elderly.³² Table 1 summarises key elements in the attainment of improved nutrition outcomes.

Table 1: Key points in the nutrition care of the older person with cancer.

- Older people with cancer should be screened for malnutrition risk at diagnosis, planning of anticancer therapy and regularly during treatment and follow-up.
- Patients identified as at risk of malnutrition should be referred for a comprehensive nutrition assessment and care plan (e.g. by a dietitian), which is communicated between health care settings.
- Formal nutritional assessment of patients identified as being at high nutritional risk should be undertaken utilising appropriate tools validated for use in the oncology patient outcomes.
- Early identification and treatment of nutrition problems can lead to improved patient outcomes.
- All members of the multidisciplinary team can play a proactive role in the nutritional care of patients.

Recommendations

The older person with cancer is particularly susceptible to the detrimental sequelae of malnutrition arising from the overlap of both age-related and cancer-induced aetiologies. The potential for decline in nutritional status is multifactorial, arising from reduced dietary intake (both disease and treatment-related nutrition impact symptoms), the effects of aging and the burden of disease. Members of the multidisciplinary team can proactively participate in addressing the nutritional needs of this group. In particular, it is recommended that routine malnutrition screening in both ambulatory and inpatient settings is implemented and that access to specialist dietitians for comprehensive nutritional assessment, intervention and monitoring is essential as part of an effective multidisciplinary team approach in order to achieve delivery of best practice, evidence-based nutritional care to the oncogeriatric population. Health administrators need to ensure there are adequate numbers of trained staff available in both the geriatric and cancer treatment settings

to undertake appropriate assessments, intervention and monitoring to ensure improved outcomes.

References

1. Australian Institute of Health and Welfare & Australasian Association of Cancer Registries 2012. Cancer in Australia: an overview, 2012. Cancer series no. 74. Cat. no. CAN 70. Canberra: AIHW.
2. Khasraw M, Marx G. Chemotherapy in the elderly. *Cancer Forum* 2008;32(1):8-11.
3. Etzioni DA, El-Khoueiry AB, Beart RW, Jr. Rates and predictors of chemotherapy use for stage III colon cancer: a systematic review. *Cancer* 2008;113(12):3279-89.
4. Neugut AI, Fleischauer AT, Sundararajan V, Mitra N, Heitjan DF, Jacobson JS, et al. Use of adjuvant chemotherapy and radiation therapy for rectal cancer among the elderly: a population-based study. *J Clin Oncol*. 2002;20(11):2643-50.
5. Vandewoude M. Nutritional assessment in geriatric cancer patients. *Support Care Cancer*. 2010;18(Suppl 2):S51 – S56.
6. Muscaritoli M, Anker SD, Argilés J, Aversa Z, Bauer JM, Biolo G et al. Consensus definition of sarcopenia, cachexia and pre-cachexia: Joint document elaborated by Special Interest Groups (SIG) "cachexia-anorexia in chronic wasting diseases" and "nutrition in geriatrics". *Clinical Nutrition*. 2010; 29(2): 154-159.
7. Donini LM, Savina C, Canenella C. Eating habits and appetite control in the elderly: the anorexia of aging. *Int Psychogeriatr*. 2003 Mar;15(1):73-87.
8. Fearon K, Strasser F, Anker SD, Bosaeus I, Bruera E, Fainsinger RL et al. Definition and classification of cancer cachexia: an international consensus. *Lancet Oncol*. 2011 May;12(5):489-95.
9. Watterson C, Fraser A, Banks M, Isenring E, Miller M, Silvester C, et al. Evidence based practice guidelines for the nutritional management of malnutrition in adult patients across the continuum of care. *Nutrition & Dietetics* 2009 Dec;66 (Suppl 3):1-34.
10. Isenring E, Cross G, Kellett E, Koczwara B, Daniels L. Nutritional status and information needs of medical oncology patients receiving treatment at an Australian public hospital. *Nutrition and Cancer*. 2010; 62(2):220-228.
11. Elia M, Stratton RJ. An analytic appraisal of nutrition screening tools supported by original data with particular reference to age. *Nutrition*. 2012;28(5):477-94.
12. Pressoir M, Desne S, Berchery D, Rossignol G, Poiree B, Meslier M et al. Prevalence, risk factors and clinical implications of malnutrition in French Comprehensive Cancer Centres. *Br J Cancer*. 2010; 102: 966-97
13. Findlay M, Bauer J, Brown T, Davidson W, Hill J, Isenring E et al. Evidence-based practice guidelines for the nutritional management of adult patients with head and neck cancer. 2011. (Available from: http://wiki.cancer.org.au/australia/COSA:Head_and_neck_cancer_nutrition_guidelines, accessed April 2013).
14. Brown T, Findlay M, Bauer J, von Dincklage J, Davidson W, Hill J et al. Using a wiki platform to promote guidelines internationally and maintain their currency: Evidence based guidelines for the nutritional management of adult patients with head and neck cancer. *J Hum Nutr Diet*. 2013: First published online 21 Jan 2013, DOI: 10.1111/jh. 12036).
15. Agarwal E, Ferguson M, Banks M, Batterham M, Bauer J, Capra S, et al. Malnutrition and poor food intake are associated with prolonged hospital stay, frequent readmissions, and greater in-hospital mortality: Results from the Nutrition Care Day Survey 2010. *Clinical Nutrition* (accepted 29 Nov 2012, published online 06 December 2012).
16. McCarthy A, Isenring E, Baumann S, Yates P, Skerman H, Walpole E, et al. Nutrition screening and risk factors prior to chemotherapy in cancer patients 65 years and older. *MASCC* 2013 (abstract).
17. Weimann A, Braga M, Harsanyi L, Laviano A, Ljungqvist O, Soeters P, et al. European Society of Parenteral and Enteral Nutrition (ESPEN) Guidelines on Enteral Nutrition: Surgery including organ transplantation. *Clin Nutr*. 2006 Apr;25(2):224-44.
18. Reidel B, Ismail H, Findlay M, Ryan R. Nutritional status and fitness in neoadjuvant chemoradiation and surgery for oesophagogastric cancer. *Cancer Forum* 2011; 35(3): 170 - 175.
19. Brownie S. Why are elder. *National Comprehensive Cancer Network (NCCN). Practice Guidelines in Oncology: NCCN, 2007.*
20. National Comprehensive Cancer Network (NCCN). Senior Adult Oncology v.2.2007. *NCCN Clinical Practice Guidelines in Oncology: NCCN, 2007.*
21. Isenring E, Zabel R, Bannister M, Brown T, Findlay M, Kiss N, et al. Updated evidence-based practice guidelines for the nutritional management of patients receiving radiation therapy and/or chemotherapy. *Nutrition & Dietetics* 2013; DOI: 10.1111/1747-0080.12013
22. Bauer JD, Ash S, Davidson WL, Hill JM, Brown T, Isenring EA et al. Evidence-based practice guidelines for the nutritional management of cancer cachexia. *Nutrition & Dietetics*. 2006;63:S3-32.
23. Ferguson M, Capra S, Bauer J, Isenring E, Miller M, Silvester C et al. Development of a valid and reliable malnutrition screening tool for adult acute hospital patients. *Nutrition*. 1999;15:458-464
24. Marshall WJ. Nutritional assessment; its role in the provision of nutritional support. *J Clin Pathol* 2008;61:1083-1088.
25. Bouillanne O, Hay P, Liabaud B, Duché, Cynober L, Aussel C. Evidence that albumin is not a suitable marker of body composition-related nutritional status in elderly patients. *Nutrition*. 2011;165-169.
26. Detsky AS, McLaughlin JR, Baker JP, Johnston N, Whittaker S, Mendelson RA, et al. What is subjective global assessment of nutritional status? *J Parenter Enteral Nutr*. 1987;11(1):8-13.
27. Ottery FD. Patient generated-subjective global assessment. In: McCallum PD, Poliseña CG, ed. *The clinical guide to oncology nutrition*. Chicago: The American Dietetic Association 2011;11-23
28. Guigoz Y, Vellas B and Garry PJ. Mini Nutritional Assessment: A practical assessment tool for grading the nutritional state of elderly patients. *Facts Res Gerontol (Suppl)*. 1994; 15-59.
29. Read JA, Crockett N, Volker DH, MacLennan P, Boris Choy ST, Beale P et al. Nutritional assessment in cancer: Comparing the Mini-Nutritional Assessment (MNA) with the Scored Patient- Generated Subjective Global Assessment (PGSGA). *Nutrition and Cancer*. 2005;53(1):51-56.
30. Isenring E, Loeliger J, Hodgson B. Nutritional management of patients with cancer improves nutritional and quality of life outcomes. *Cancer Forum* 2011; 35: 88-91.
31. Santaripa L, Contaldo F, Pasanisi F. Nutritional screening and early treatment of malnutrition in cancer patients. *J Cachexia Sarcopenia Muscle*. 2011; 2: 27-35.
32. Capra S, Bauer J, Davidson W, Ash S. Nutritional therapy for cancer-induced weight loss. *Nutr Clin Pract*. 2002; 17: 210-213.

FORTY YEARS OF COSA – CONTRIBUTIONS TO ONCOLOGY TEACHING AND RESEARCH

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From its beginnings, the essence of the Clinical Oncology Society of Australia (COSA) was its multi-disciplinary approach to treating cancer. While the need for a cross or multi-disciplinary approach was eventually to be seen as obvious and essential, it required considerable effort to break the established pattern of the medical profession. Surgeons were used to meeting and talking with surgeons, radiation oncologists with radiation oncologists, and so on; the long-established medical societies and colleges tended to be single-discipline in their focus.

From about 1966 or 1967 the Australian Cancer Society (ACS) organised annual scientific meetings over one or two days in November, in Melbourne and Sydney alternatively. These meetings were attended by a relatively small group of clinicians/researchers working in universities and major teaching hospitals. The meetings allowed a sharing of knowledge and experiences, and soon reflected the emergence of a multi-disciplinary approach to patient care.

The ACS continued to support these activities and by 1969 the meetings had clinical sessions for both head and neck and breast specialists. Discussions continued about forming a separate society to enhance this co-operation and on September 9 1972, the executives of the Head and Neck and Breast Groups agreed to form the Clinical Oncological Society of Australia (renamed this year to the Clinical Oncology Society of Australia). COSA was chosen as the acronym to avoid any confusion with the American Society of Clinical Oncology (ASCO), although some also liked the symbolism involved: Cosa is the Italian word for family.

The broad principles for COSA's new constitution were adopted at the first annual general meeting in November 1972. At this stage there were 107 members registered with the Head and Neck group and 82 with the Breast group, with some belonging to both groups. There were members in all Australian states except Tasmania and in the Territory of Papua and New Guinea. Brian Fleming was the chairman of the organisation, but was not formally elected President until the constitution was adopted at the November 1973 meeting.

The founding fathers of COSA intended that its original two groups, Head and Neck and Breast, would be joined by others. The first group to join them was the Experimental group, renamed Cancer Research group

six years after its establishment. These researchers came together under COSA "to provide for exchange between all aspects of cancer research - clinical, laboratory, basic and applied." One significant point about this group was that, unlike the other two, it was not focused on a cancer site in the body; COSA was, thus, immediately spreading its coverage. Next to join was the Paediatric Oncology Group. Its Chairman, John Colebatch of the Royal Children's Hospital in Melbourne, was a pioneer of work on childhood leukaemia. His work had brought together pathologists, surgeons, radiotherapists and the newer contributions of medical oncologists.

Although some members of COSA were concerned about the widening membership, in 1977 after a review, the membership clause of the constitution was broadened so that it could include someone who had "made a significant contribution to knowledge in the field of cancer" or "such other persons as the Executive Committee may decide." The continued formation of new groups within COSA can be seen in the complete list appended to this paper (appendix 1). However, two groups that deserve special mention are the Medical Oncology Group, which formally joined COSA in 1979, and the formation of the Oncology Nursing Group in 1980. By 1980 there were 10 groups in COSA, representing a total membership of 900.

From its beginnings, COSA was accepted as representing the clinical side of the Australian anti-cancer campaign. COSA's influence was undoubtedly spread further by two regular publications which emerged during its first 10 years. In 1974 *Cancer Forum* was first published. It was published by the ACS but content largely came from the work of members of COSA. Lawrie Wright, who from 1979 was the ACS Executive Director, continued the close relationship with COSA. On his initiative a COSA newsletter, the *Marryalyan*, first appeared in August 1980. COSA remains affiliated with and provides medical and scientific advice to Cancer Council Australia, (formerly ACS).

Ideal Oncology Curriculum

In the 1990s, Cancer Council Australia and COSA together developed the *Ideal Oncology Curriculum*, as a document describing the essential elements of oncology education for graduating medical students.¹

This initiative was developed after the authors (Smith, Tattersall, Irwig, and Langlands – prominent senior COSA members) had documented substantial variability in training and experience and substantial lack of knowledge about cancer among the graduates from Australian medical schools.²

As a consequence the Oncology Education Committee, Cancer Council Australia and COSA, in conjunction with the authors, developed the *Ideal Oncology Curriculum* for medical schools (published 1999, Australian Cancer Society). The Oncology Education Committee is a multi-disciplinary group of cancer clinicians and educators, mainly COSA members supported by Cancer Council Australia, representing all medical schools in Australia. The objectives of the committee are to monitor and improve the standards of cancer education in Australian medical schools.

The *Ideal Oncology Curriculum* was developed as a consensus-based curriculum after extensive consumer consultation across the country, and has served as a basis of newly developed medical school curricula and as a guide to development of cancer teaching in other disciplines, including nurse practitioner training and professional development of cancer professionals.

The curriculum includes areas such as prevention, screening, early detection, diagnosis, active management, palliation and terminal care. It focuses on clinical practice, but also on understanding cancer biology. This curriculum has been adopted by the majority of medical schools in Australia, and has led to periodic review of progress in curriculum uptake and outcomes,³⁻⁵ as well as discussion of similar curriculum development in Europe,⁶ and the US.⁷

Australia and Asia Pacific Clinical Oncology Research Development

Workshops

COSA has supported the development and implementation of the Australia and Asia Pacific Clinical Oncology Research Development (ACORD) workshops, which were spearheaded by the Medical Oncology Group of Australia, as the brainchild of Bogda Koczwara. Many COSA members have made valuable contributions as faculty members towards these workshops by providing time and effort with design, conduct and evaluation of the five workshops conducted biennially since 2004. The format has been week-long, live-in, intensive workshop, whereby junior researchers get hands-on experience with design of a clinical trial, education on the principles, strategies and options for all types of trial design, and conduct and analysis, and come away with a complete trial protocol for implementation in their home institution. Designed to increase training and engagement in clinical trials by oncology professionals, ACORD workshops have been well attended by students from diverse disciplines (medical oncology, radiation oncology, surgical oncology, palliative care, nursing, allied health and other fields). These workshops are highly regarded and rank similarly to workshops run in the US and Europe.

COSA Annual Scientific Meeting

COSA has conducted an Annual Scientific Meeting continuously since 1973. These meetings have always had a high level of educational input for COSA members from all disciplines. COSA Annual Scientific Meetings are formatted around oral presentations and posters, with plenary sessions on current issues in cancer care, cancer education and basic science. In recent years, meetings have been held in collaboration with the Australian Health and Medical Research Congress, Australian and New Zealand Gastric and Oesophageal Surgery Association, International Association of Cancer Registries, Australia and New Zealand Breast Cancer Trials Group, Australian and New Zealand Urogenital and Prostate Cancer Trials Group, and International Psycho Oncology Society. These collaborations have led to value-added aspects and broad dialogue with experts not limited to the cancer field.

Several clinical trials cooperative groups, including the Australian and New Zealand Children's Haematology/Oncology Group, Australasian Gastro-Intestinal Trials Group, Australia and New Zealand Melanoma Trials Group and Australian and New Zealand Urogenital and Prostate Cancer Trials Group, were developed out of the COSA clinical groups.

Education in clinical trials

Since the mid-2000s, COSA has conducted a series of workshops and other initiatives providing educational opportunities for members in the area of clinical trials. The COSA Enabling Project (2006–2011), funded by the National Health and Medical Research Council (NHMRC) under the leadership of Steve Ackland and Haryana Dhillon, and in collaboration with the Cancer Cooperative Trial Groups (CCTGs), undertook a review of clinical trials insurance. The trial enlightened the oncology community as to the current clinical trial risk environment and insurance options, including risk mitigation strategies, inefficiencies and areas of insurance overlap. The review highlighted several options for rationalisation, and ultimately led to a consolidation of cooperative groups insurance arrangements that saved about \$150,000 per annum on premiums for CCTGs. COSA continues to facilitate the umbrella insurance policy on behalf of the nine CCTGs participating in this scheme.

Workshops conducted since 2005 have included: the development of clinical trials registers (February 2005), which ultimately lead to the development of the ANZ Clinical Trials Registry; a clinical trials research agreement workshop (2010) that led to a standardised template for agreement between cooperative groups and participating sites; and a clinical trials risk minimisation workshop (2010).

In 2009-10, in partnership with the Association of Regulatory and Clinical Specialists, COSA funded 100 members to undertake the Association of Regulatory and Clinical Specialists online applied good clinical practice education and training modules on clinical trials. These three modules include research and the foundations of good clinical practice, stakeholder roles and responsibilities, and practical considerations in the conduct of clinical trials.

In 2011, COSA received funding from Cancer Australia to develop a comprehensive strategy for increased consumer involvement at all levels of clinical cancer research across all the CCTGs. Through the efforts of COSA and the CCTGs Consumer Network, on February 2013 (World Cancer Day), Cancer Australia launched the Consumer Learning website. This site has been developed to enhance the contribution to clinical trials research of people affected by cancer. Consumers working with the CCTGs now have access to a suite of learning and support initiatives to enhance knowledge and skills in partnering with researchers to conduct quality patient-centred clinical trial research.

Complementary and Integrative Therapies

The COSA Complementary and Integrative Therapies Group was established following two workshops held in 2007 and 2008. These workshops highlighted a broad range of issues relating to the need for information and education about complementary therapies in cancer care. Also highlighted was the need to promote evidence-based information about complementary therapies for patients and health professionals, to empower oncology health professionals to engage in discussions with patients about complementary therapies, to develop and promote guidelines and minimum standards for delivery of complementary therapies, and to utilise and build on existing resources and avoid duplication.

The group has developed the Complementary Toolkit, available on the COSA website. The kit provides educational information about complementary therapies and offers suggested approaches by cancer clinicians to discuss complementary therapies with patients and where appropriate, integrate complementary and alternative therapies into their practice.

The Complementary and Integrative Therapies Group was supported by the evidence-based website group chaired by Alayne Read, whose role was to ensure the toolkit was evidence-based and contained materials necessary to assist cancer health professionals in its objectives.

In May 2013, COSA published a position statement on 'The use of complementary and alternative medicine by cancer patients'. The purpose of this document is to outline COSA's position on the use of complementary and alternative medicine (CAM) by cancer patients and to provide guidance for health professionals involved with the treatment of cancer patients who are using or wish to use CAM.

Clinician burnout survey

COSA promoted and facilitated a cancer clinician burnout survey in 2007, which led to a paper describing the incidence and severity of burnout among Australian cancer clinicians. A total of 740 COSA members (56% of the membership) completed the survey, which used various tools to assess prevalence of burnout, the prevalence of psychological distress, demographic and occupational predictors of burnout, and perceived causes of burnout. The report recommended strategies for preventing or reducing the impact of burnout of cancer care personnel.⁸ Key findings of the report were that self-reported levels of burnout were high, particularly in oncologists and palliative

care physicians, and particularly in those with direct patient contact in their jobs. The proportion of COSA respondents with moderate to severe levels of psychiatric morbidity was comparable to the Australian general population. Predictors of burnout were dissatisfaction with leave arrangements, a high perceived need for communication skills training and a perceived heavy workload.⁹

Clinical practice guidelines

COSA has facilitated and contributed to a variety of guidelines on management of various malignancies, 25 of which are available on the NHMRC website as NHMRC-approved guidelines.

Tom Reeve, Senior Medical Advisor at the Australian Cancer Network (1993-2010), had a pivotal role in managing the development and production of the majority of these guidelines over many years. His mammoth efforts towards this challenging task (cat-herding) are to be congratulated. The Australian Cancer Network, now known as Cancer Council Australia's Clinical Guidelines Network, has developed high standards of preparation and evaluation of guidelines for health professionals. Equally important, most guidelines are also produced in a condensed format for use in general practice and written for patients and non-clinical readers.

Many of these guidelines are still on oncologists' desks, although web-based electronic versions are now preferred. Cancer Council Australia's wiki platform is a web-based portal that provides information and education on clinical practice guidelines that can be updated as the evidence changes.

In 2005, COSA established the Tom Reeve Oration Award for Outstanding Contributions to Cancer Care, to formally acknowledge Tom's remarkable contribution. The aim of this award is to formally recognise a national leader resident in Australia who has made a significant contribution over a relatively long period towards cancer care through research, clinical leadership and/or community service.

In recent years COSA has developed guidelines in the areas of adolescents and young adults with cancer, the nutritional management of head and neck cancer patients and neuroendocrine tumours. All are available on the Cancer Council Australia wiki platform.

COSA chemotherapy guidelines

In 2008, COSA's Pharmacy Group, under the chairmanship of Christine Carrington, convened a working group including nurses and medical oncologists to develop a draft set of guidelines for the safe prescription, dispensing and administration of cancer chemotherapy.

The guidelines aim to assist in the prevention of medication errors and to improve patient safety with respect to the drug treatment of cancer. They are intended for a multidisciplinary audience, including medical nursing and pharmacy staff involved in delivering chemotherapy.

The guidelines define 13 areas where a guidance statement is applicable to all professional disciplines, and three individual sections based on the processes and the

professionals involved in the provision of cancer therapy. The guidelines were published in the *Asia-Pacific Journal of Clinical Oncology*.¹⁰

Wall Report, 2002

In 2001, then COSA president, John Zalberg, and the COSA Council, developed an issues paper 'Cooperative Clinical Trials in Cancer – the Need for Increased Capacity' (the Wall Report), published in 2002. This document was the result of a number of workshops, attended by COSA members of all disciplines, members of the nine CCTGs, and other stakeholders in the delivery of cancer care and clinical research. The workshops outlined the current status of cancer clinical trials in Australia, gaps in capacity, funding mechanisms and governance issues, and made a number of recommendations regarding funding and support for cooperative trials groups. Several of these recommendations have taken up by the Department of Health and Ageing and subsequently through Cancer Australia, which have provided modest funds as infrastructure support for CCTGs in Australia. One of the recommendations included the development of a clinical trials registry, which led to the highly successful ANZ Clinical Trials Registry. COSA continues to be active in advocacy for cancer clinical trials, with several members contributing to the recent Clinical Trials Action Group report by the Department of Health and Ageing and Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education,¹¹ as well as contributions towards the McKeon Review.¹²

Rural cancer services

Since 2000, COSA has developed a number of initiatives to advance rural health care and education. The 'Cancer in the Bush' conference, convened in 2001, first brought together cancer health professionals from all over Australia to recognise the unique issues facing patients and their service providers. Subsequent workshops in 2006, 2009 and 2012 have all built upon the improved multidisciplinary interaction facilitated by COSA. COSA has also subsequently collaborated with the Australian Rural Health Alliance and presented on rural cancer issues at several Alliance annual meetings. This ultimately led to a closer working relationship with Divisions of General Practice and other organisations involved in rural health.

The Regional and Rural Group of COSA was also formed. This is a multidisciplinary group focused on the unique issues facing cancer service delivery outside metropolitan areas. The group aims to highlight the deficiencies in service delivery, enhance equity of access to current best practice care and facilitate clinical research and access to clinical trials. Critical to success is cancer health education of rural health practitioners and communities, to empower them to reduce inequity in services.¹³ COSA commissioned a cross sectional survey of service provision in 2005, which identified many major gaps in service.¹⁴ This was more recently complemented by the psychosocial unmet needs of patients and of health professionals.^{15,16} COSA's efforts were rewarded with the announcement of enhanced infrastructure for regional cancer services in 2010.

Multidisciplinary education

COSA has been a partner in a major online education activity initiated by Cancer Australia. The Cancer Learning online hub aims to consolidate the enormous variety of evidence-based learning activities, resources and information in cancer care available across Australia and overseas. As a part of this activity, COSA was invited to join the Professional Development Packages Project. The aim of this project is to develop a national professional development framework and educational packages for cancer professionals, counsellors and general practitioners. It is being conducted by a consortium composed of four organisations: COSA; the National Breast and Ovarian Cancer Centre; Cancer Council Australia; and the Royal Australian College of General Practitioners. The project is managed by the Workforce Education and Development Group at the University of Sydney.

A recent educational initiative has been the multidisciplinary trainees workshops, held preceding the Annual Scientific Meeting in 2010, 2011 and 2012. As part of the commitment of COSA to enhancing and promoting multidisciplinary care, COSA developed a plan to run a training weekend that crossed all health professionals. The first workshop covered management of breast cancer, the second focused on colorectal cancer and the third on skin cancer. A broad cross-section of surgical trainees, nurses, medical and allied health professionals were in attendance.

Promoting education by consensus workshops

COSA has been very active in establishing benchmarks of practice through workshops that provide state-of-the-art review of practice in a field. COSA has acted as a facilitator of practice improvement and health system development by identification of issues. Three significant examples have been the cancer care co-ordinators workshops 2006, 2007 and 2012, which have led to benchmarking of desired outcomes and standards of care. The neuroendocrine tumours workshop in 2008 brought together experts from many different disciplines and established an ongoing practice improvement initiative in the form of a national registry – the SIGNETURE registry, facilitated by COSA. Annual adolescent and young adult workshops from 2008 to 2012 have led to greater collaboration and improved co-ordination between disciplines. The geriatric oncology workshop 2008 led to the establishment of a broad multidisciplinary group to foster this growing area of need in both service delivery and innovative care approaches.¹⁷

Conclusion

COSA and its members have been active contributors to cancer training and education for over 30 years. Many initiatives supported by COSA have been novel and have led to substantial improvements in the educational resources available to oncology health professionals, for the improvement of cancer healthcare delivery and ultimately the health of the Australian population. The aim to promote excellence and encourage multidisciplinary collaboration in all aspects of cancer care and research, manifest by COSA's

history of contribution to cancer education, still stands as an important objective in the constitution.

References

1. Oncology Education Committee (of COSA and ACS). Ideal oncology curriculum for medical schools. Australian Cancer Society, Sydney, 1999.
2. Smith WT, Tattersall MHN, Irwig LM, Langlands AO. Undergraduate Education about Cancer. *European J Cancer*. 1991; 27:1448-1453.
3. Tattersall MH, Langlands AO, Simpson JS, Forbes JF. Undergraduate Education about cancer: a survey in Australian medical schools. *Eur J Cancer Clin Oncol*. 1998; 24:467-471.
4. Barton MB, Simons RG. A survey of cancer curricula in Australian and New Zealand Medical schools in 1997. *Oncology Education Committee of the ACS. Med J Aust*. 1999; 170:225-227.
5. Barton MB, Tattersall MH, Butow PN, Crossing S, Jamrozik K, Jalaludin B, et al. Cancer knowledge and skills of interns in Australia and New Zealand in 2001: comparison with 1990, and between course types. *Med J Aust*. 2003; 178:285-289.
6. Pavlidis N, Vermorken JB, Stahel R, Bernier J, Cervantes A, Audisio R, et al. Oncology for medical students: a European School of Oncology contribution to undergraduate cancer education. *Cancer Treat Rev*. 2007;33(5):419-26.
7. Koczwara B, Barton MB J. The ideal oncology curriculum for medical students. *J Clin Oncol*. 2006; 24:5334.
8. Girgis A, Hansen V. Prevalence and predictors of burnout in the COSA oncology workforce. [Internet] Centre for Health Research and Psycho-oncology (CHeRP). 2007. Available from: <https://www.cosa.org.au/publications/reports-and-papers.aspx>
9. Girgis A, Hansen V, Goldstein D. Are Australian oncology health professionals burning out? A view from the trenches. *Eur J Cancer*. 2009;45(3):393-9.
10. Carrington C, Stone L, Koczwara B, Searle C. Development of guidelines for the safe prescribing, dispensing and administration of cancer chemotherapy. *Asia-Pac J Clin Oncol*. 2010;6(3):213-9.
11. Clinical Trials Action Group. Clinically Competitive: boosting the business of clinical trials in Australia. <http://www.innovation.gov.au/Industry/PharmaceuticalsandHealthTechnologies/ClinicalTrialsActionGroup> (accessed Sep 10, 2013).
12. Strategic Review of Health and Medical Research – Better Health through Research [Internet] Available from: www.mckeeonreview.org.au [accessed Sep 10 2013].
13. Underhill CR, Goldstein D, Grogan PB. Inequity in rural cancer survival in Australia is not an insurmountable problem. *Med J Aust*. 2006;185(9):479-80.
14. Underhill C, Bartel R, Goldstein D, Snodgrass H, Begbie S, Yates P, et al. Mapping oncology services in regional and rural Australia. *Aust J Rural Health*. 2009;17(6):321-9.
15. Butow PN, Phillips F, Schweder J, White K, Underhill C, Goldstein D. Psychosocial well-being and supportive care needs of cancer patients living in urban and rural/regional areas: a systematic review. *Support Care Cancer*. 2012;20(1):1-22.
16. Grimison P, Phillips F, Butow P, White K, Yip D, Sardelic F, et al. Are visiting oncologists enough? A qualitative study of the needs of Australian rural and regional cancer patients, carers and health professionals. *Asia Pac J Clin Oncol*. 2013; 9(3): 226-38.
17. SteerCB,MarxGM,SinghalN,McJannettM,GoldsteinD,ProwseR. Cancer in older people: a tale of two disciplines. *Intern Med J*. 2009;39(11):771-5.

Appendix 1: Professional groups within COSA

- Adolescent and Young Adult
- Biobanking
- Breast Cancer
- Cancer Biology
- Cancer Care Coordination
- Cancer Pharmacists
- Clinical Trials and Research Professionals
- Complementary and Integrative Therapies
- Developing Nations
- Epidemiology
- Familial Cancer
- Gastrointestinal Cancer
- Geriatric Oncology
- Gynaecological Cancer
- Lung Cancer
- Melanoma and Skin Cancer
- Neuroendocrine Tumours
- Neuro-oncology
- Nutrition
- Paediatric Oncology
- Palliative Care
- Psycho-oncology
- Radiation Oncology
- Regional and Rural Oncology
- Social Work
- Surgical Oncology
- Survivorship
- Urological Oncology

AWARDS

CANCER COUNCIL AUSTRALIA'S STUDENT ESSAY COMPETITION

Cancer Council Australia's annual essay competition is open to Australian residents enrolled in a medical course in an Australian university. Students are required to submit an essay on an issue related to cancer control. In 2013, the topic was 'Cancer in General Practice'. The essays are judged by members of Cancer Council Australia's Oncology Education Committee.

The winning essay in the 2013 Student Essay Competition was submitted by Amanda Tillmann. Amanda attended the summer school in Vienna, Austria, from 10-19 July.



CANCER IN GENERAL PRACTICE – ACCOMPANYING PATIENTS ALONG THE JOURNEY

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In the context of Australia's increasing cancer survivorship rates and ageing population, it is inevitable that cancer will make its mark on the careers of general practitioners. This is confirmed in reports stating that average general practitioners will annually encounter around four new patients with diagnoses of potentially fatal cancers, and that they have roughly 16 patients diagnosed with cancer under their care at any point in time.¹ General practitioners' multidimensional involvement in their patients' health, combined with the trusting and long-standing relationships they often share with patients, places them in a unique position to make significant contributions to patients' wellbeing throughout the cancer care journey.

This essay will delve into the wide and varied contributions made by general practitioners throughout the spectrum of their patients' cancer experiences, including their roles in cancer prevention, screening, diagnosis, treatment, survivorship and palliative care. The challenges currently facing the general practitioner community will also be explored, as well as the possible future initiatives to ameliorate such obstacles. The essay will ultimately conclude with consideration of the ways the skills learnt in medical education translate into future general practice and prepare students to deliver appropriate and quality care.

Role of the general practitioner at different stages of cancer management

Prevention

The alarming statistics that one in three Australian cancer cases are preventable and that more than 13,000 cancer deaths could be avoided annually if lifestyle factors such as smoking, diet, alcohol intake, physical activity, weight and sun exposure were properly managed, give an indication of the potential of preventative initiatives in reducing the burden of cancer.² Cancer prevention and lifestyle factor modification have traditionally been associated with general

practice and comprise a major part of primary practice's involvement in cancer care. On average, Australians visit a general practitioner five times annually, often with the expectation of being informed about and receiving assistance with preventative health problems. This context places primary care practitioners in an ideal position to act as agents promoting healthy lifestyle alterations and easily allows them to monitor and assess these changes.³

The Federal Government's 'Lifescrpts' initiative involves a variety of evidence-based brief-interventional means, by which general practitioners can discuss, advise and educate patients about lifestyle factors overall aiding in cancer and other chronic disease prevention.⁴ Key components of this program and complementing practices recommended by the Royal Australian College of General Practitioners (RACGP), include: utilisation of the 5As assessment and management framework; behavioural counselling approaches, incorporating motivational interviewing; and regular physical and history health checks.^{5,6} The latter, for example, has been shown in Australian studies to improve patients' willingness to implement diet and exercise changes, resulting in a consequent increase in fruit and vegetable consumption and exercise participation.³ Another essential element of lifestyle modification mediated cancer prevention in general practice is the use of referrals to counselling, follow-up and supportive services, such as Quitline for smoking. The action of such referrals has been shown in Cochrane reviews to double the efficacy of advice offered in primary care.⁶

Screening, detection and referral

Cancer screening, detection and referral represent other aspects of the cancer management spectrum in which general practice has a long-established role. Screening of breast, colorectal and cervical cancers forms a vital part of general practice and is believed to significantly contribute to better outcomes in the screened cancers, for example

Australia having the lowest mortality rate of cervical cancer globally.⁵

General practitioners hold a 'gatekeeper' position, referring to their role of mediating the transition of suspected malignancy cases from primary to secondary care through referral to appropriate specialists. Ensuring this is done efficiently and not unnecessarily requires general practitioners to engage in thorough history-taking, examination and diagnostic work-ups in a timely fashion.⁷ British audits have revealed that general practitioners refer more than 75% of patients who receive a confirmed diagnosis of cancer from secondary specialists after only one or two consultations, an indicator of the important role played by general practitioners in initial assessment.⁸

Care during active disease

As cancer management shifts from a more segregated approach, with clearly defined borders between primary and secondary health, to a multidisciplinary model increasingly characterised by integration and collaboration, the general practitioner's role in the care of patients undergoing treatment is becoming more prominent.⁹ The degree of involvement is highly dependent on the treatment modality, as well as accessibility of specialist care. An example of general practitioners' participation in the treatment stage is their involvement in chemotherapy, which can take a variety of forms including pre-treatment haematological and biochemistry checks, managing of side-effects and administration of treatment.¹⁰ Psychological support is also another crucial responsibility often held by general practitioners during treatment when patients' health-related quality of life can suffer.¹¹

Survivorship and palliative care

As curative cancer treatments improve, cancer-related mortality descends, having great implications for general practitioners by placing demand on their survivorship care services.¹⁰ The general practitioner's holistic, multidimensional and personalised approach to health is of utmost importance at this stage of the cancer care journey, which involves balancing a variety of tasks such as: monitoring for signs of recurrence; treating side-effects from treatment; health promotion; assistance with organising additional support services or involvement in support groups; addressing psychosocial effects; and care of family or caregivers related to the patient. In cases where a palliative management strategy is indicated, general practitioners can contribute to care through symptom control, carer bereavement support and care coordination, overall creating a sensitive and considerate environment for the end of life.¹³

Challenges and future directions of cancer management in general practice

Diagnostic issues

Delayed diagnosis represents a great hurdle to optimal cancer management in general practice. A British audit study involving more than 13,000 diagnosed cancer patients revealed that while early diagnosis and referral occurred in the majority of cases, roughly 20% of patients were not referred until three or more consultations had taken place

and between 34 and 97 days had elapsed since their initial presentation. These deferred diagnoses often occurred in cases with non-specific symptoms associated with multiple myeloma, lung and stomach cancers.¹⁴ Cancer symptoms presenting in patients with atypical age and gender, as well as lack of relevant risk factors, are other elements that can confound general practitioners and hinder early diagnosis.¹⁰

This tardiness of diagnosis is especially significant in determining the outcome of cancers such as lung cancer, in which early detection and treatment can significantly increase life expectancy.¹⁵ Recent projections assert that between 5000 and 10,000 deaths within five years of diagnosis, could potentially be prevented annually in England if early primary diagnosis and surgical treatment were improved.¹⁶

Strategies by which a more timely diagnosis can be achieved in future practice include the development and encouraged use of systematic and accessible clinical decision support tools, aimed at enhancing efficiency of investigation and referral pathways. Efforts to accomplish this in Australia have involved: Cancer Council's General Practice Committee's development of the Primary Care Resources Directory; Cancer Australia's Clinical Best Practice guidance material for general practitioners; and the Cancer Institute of NSW's development of a flipchart of Referral Pathways for Suspected Cancer.^{17,18,19} These resources aim to provide standardised information to the primary practice sector on the distinguishing of cancer symptoms and implementing of appropriate investigations, hence producing more efficient and informed diagnoses and referral decisions. Ultimately, the clinical improvements in general practice potentially produced by such guidelines could better the overall cancer outcome for many patients in the future.

Communication issues in multidisciplinary care

The multidisciplinary model that underpins the current desired approach to cancer care management is heavily reliant upon effective communication between stakeholders. Rowlands et al. have recently illuminated the flaws in the communication relations between secondary care providers and general practitioners when patients are discharged from specialist care, including poor timing and exchange of incomplete information.²⁰ This lack of punctuality and information regarding patient treatment and details is well documented in the literature as interfering with general practitioners' ability to confidently manage their cancer patients. The study revealed that belated receiving of important patient information placed general practitioners in the awkward position of being unable to answer patients' queries and having to, at times, depend upon the unreliable accounts of events relayed by the patients themselves. Communication with general practitioners was shown to be primarily managed by medical officers and hence, often had a clinical focus that did not meet primary care workers' need for social and allied healthcare information, which is required for holistic patient management.

In light of these findings, suggestions to mitigate communication barriers included: utilisation of shared electronic health records enabling access to health information instantaneously; implementation of standardised multidisciplinary discharge summaries; and encouraging

involvement of general practitioners in multidisciplinary team meetings.²⁰ The potential exists for these initiatives to substantially strengthen future post-treatment management of cancer patients in general practice, as well as the multidisciplinary model of cancer.

Problems with rural cancer care

One third of Australian cancer patients live in regional, rural and remote areas, and are typically attributed with poorer outcomes. Reduced access to predominantly urban-based specialist and tertiary hospital services, and workforce shortages, place rural general practitioners under mounting pressure to manage cancer cases in difficult conditions, such as shorter consultations and resource-poor environments relative to their urban colleagues.²¹

Australian studies have confirmed that higher and more specialised levels of skill are often demanded of rural practitioners during the cancer management of patients. Select examples of this include: the ability to engage in a greater amount of procedures including chemotherapy administration; management of emergencies such as neutropenia; and the capacity to distinguish between the urgency of cases for referral through refined skills detecting the nuances of clinical presentations.²² Many of these activities require special training and safety, management and support strategies, which are inaccessible for most rural practitioners, hence resulting in less preparedness and confidence during management.²³

Initiatives that hope to address these matters and direct future rural general practice cancer care towards a better supported and more multidisciplinary state include programs such as: Telehealth; the Government's establishment of specialised regional cancer centres; networking services between rural and urban professionals such as CanNET; and other state strategies.²⁴ Education represents another component of the plan to improve future rural general practice deliverance of cancer care. Cancer Australia's Cancer Learning online hub provides rural general practitioners with easily accessible educational activities and resources to facilitate the tailoring of their knowledge to the particular demands of rural cancer management.²⁵ Workshops and mentoring programs are other means by which rural general practitioners cancer knowledge can be expanded. A prime example of this approach is Country Health SA's Rural Chemotherapy Mentoring Program, which significantly enhances primary practitioners' understanding of chemotherapy principles, following collaborative learning with urban oncology specialists.²⁶

Problems with Indigenous cancer care

Cancer represents the second greatest cause of mortality among Indigenous Australians, despite attracting a disproportionately low amount of attention and often being considered a lower priority aspect of indigenous health.^{27,28} Within healthcare settings, not excluding general practice, impedance of optimal management of Indigenous cases largely revolves around a lack of cultural understanding and culturally-appropriate techniques, which can give rise to problems such as ineffective communication.²⁹ This cultural competency deficit can perpetuate problems related to poor cancer outcomes, such as the prevalence

of negative preventative lifestyle factors like smoking, lower screening rates and later diagnosis trends. This highlights the importance of general practitioners being attuned to the indigenous perspective, as they are often a central component of medical services in Indigenous communities.³⁰

One of the most recently launched initiatives, aiming to improve future indigenous cancer prospects through education about cancer from an indigenous perspective and offering of cultural-sensitivity guidance for medical professionals, is the National Indigenous Cancer Network (NICaN). Following in the wake of other health-oriented 'Close the Gap' initiatives, NICaN aspires to provide members access to evidence-based informative resources, as well as the opportunity to attend Indigenous Cancer Roundtable network meetings and take part in Yarning Place discussion, forums.³¹ It is expected that through participation in such organisations, as well as indigenous culture training programs offered by bodies like the Royal Australian College of General Practitioners, general practitioners will gain greater skill in handling Indigenous patients and consequently provide effective cancer care in the future to this patient sub-group.

Importance of university medical education in preparation for cancer management in general practice

The need to begin developing skills during university medical studies, that will later serve as solid foundations in general practice cancer management, is well recognised. Recommendations in Cancer Council Australia's *Ideal Oncology Curriculum*, as well as the Royal Australian College of General Practitioners' Oncology Syllabus, stress the importance of gaining a firm and comprehensive understanding of cancer management and its epidemiological and social context in Australia, in order to form a strong base from which finer skills can be built.^{32,33} This broad and varied bedrock of knowledge, formed in medical school, is particularly important and relevant for future general practitioners whose involvement throughout the cancer journey necessitates a good understanding of the medical science and cultural principles underlying care, as well as the ability to effectively communicate and engage in positive teamwork dynamics.

Conclusion

Increasing survivorship rates and ageing population statistics have not only changed the cancer landscape of Australia, but have also brought about changes in general practitioners' involvement with cancer management. Departure from the traditional role that was more limited to prevention, screening, referral and post-treatment care, has led to general practitioners having the opportunity to actively see patients through the entire expanse of the cancer journey by engaging in multidisciplinary and multidimensional care. However, accompanying this general practitioner role revision is the revival of old and creation of new challenges to cancer care delivery, such as issues with diagnosis, communication and service to rural and Indigenous communities. Through the implementation

of initiatives targeting these problematic areas, as well as continued medical school oncology skills education, it is hoped that general practice cancer care will be well equipped to assume an important and vital role in meeting the future needs of Australians affected by cancer.

References

1. Cancer Council Victorian [Internet]. [updated 2012 December 1; cited 2013 April 19]. Available from <http://www.cancervic.org.au/downloads/cpc/gps/cancer-care/Lesley-Pugh.pdf>.
2. Cancer Council Australia [Internet]. [updated 2012 August 12; cited 2013 April 20]. Available from <http://www.cancer.org.au/preventing-cancer/>.
3. Harris M [Internet]. Preventative Health Taskforce; c2007 [updated 2009 January 14; cited 2013 2013 April 20]. Available from [http://www.preventativehealth.org.au/internet/preventativehealth/publishing.nsf/Content/0FBE203C1C547A82CA257529000231BF/\\$File/commppaper-primary-hlth-care-harris.pdf](http://www.preventativehealth.org.au/internet/preventativehealth/publishing.nsf/Content/0FBE203C1C547A82CA257529000231BF/$File/commppaper-primary-hlth-care-harris.pdf).
4. Australian Government Department of Health and Ageing [Internet]. Commonwealth of Australia; c2010 [updated 2012 November 8; cited 2013 April 19]. Available from <http://www.health.gov.au/lifescrpts#res>.
5. Royal Australian College of General Practitioners. Guidelines for preventive activities in general practice. Melbourne: RACGP; 2012. 60 – 72
6. Australian Government Department of Health and Ageing. Lifescrpts practice manual. Canberra: Commonwealth of Australia; 2010.
7. Olesen F. Early diagnosis of cancer – the role of general practice. *Scandinavian Journal of Primary Health Care*. 2009; 27:193 – 194.
8. Mayor S. GPs spot 80% of cancers within two consultations, audit shows. *BMJ*. 2013; 346:772.
9. Weller DP, Harris MF. Cancer care: what role for the general practitioner? *MJA*. 2008;189(2):59 – 60.
10. Mitchell GK. The role of general practice in cancer care. *Australian Family Physician*. 2008;37(9): 698 – 702.
11. Roorda C, Bock H, van der Veen WJ, Lindeman A, Jansen L, van der Meer K. Role of the general practitioner during the active breast cancer treatment phase: an analysis of health care use. *Support Care Cancer*. 2012;20:705 – 714.
12. Mao JJ, Bowman MA, Stricker CT, DeMichele A, Jacobs L, Chan D, Armstrong K. Delivery of Survivorship Care by Primary Care Physicians: The Perspective of Breast Cancer Patients. *J Clin Oncol*. 2009;27(6):933 – 938.
13. Mitchell GK, Reymond EJ, McGrath BP. Palliative care: promoting general practice participation. *MJA*. 2004;180:207 – 208.
14. Lyratzopoulos G, Abel GA, McPhail S, Neal RD, Rubin GP. Measures of promptness of cancer diagnosis in primary care: secondary analysis of national audit on patients with 18 common and rarer cancers. *Br J Cancer*. 2013;108(3):686 – 690.
15. Mayo Clinic [Internet]. Mayo Foundation for Medical Education and Research; c2001-13 [updated 2012 April 17; cited 2013 April 21]. Available from <http://www.mayoclinic.org/lung-cancer/>.
16. Rubin G. Improving cancer outcomes: better access to diagnostics in primary care could be critical. *Br J Gen Pract*. 2011;61(586):317 – 318.
17. Cancer Council Australia [Internet]. [updated 2013 July 5; cited 2013 April 23]. Available from <http://www.cancer.org.au/health-professionals/primary-care-resources.html>.
18. Cancer Australia [Internet]. Australian Government; c2013 [cited 2013 April 21]. Available from <http://canceraustralia.gov.au/clinical-best-practice>.
19. Cancer Institute NSW [Internet]. [updated 2009 June; cited 2013 April 23]. Available from <http://www.cancerlearning.gov.au/docs/PathwaysFlipcharts.pdf>.
20. Rowlands S, Callen J, Westbrook J. Are General Practitioners getting the information they need from hospitals to manage their lung cancer patients? A qualitative exploration. *Health Information Management Journal*. 2012;41(2):4 – 13.
21. National Rural Health Alliance [Internet]. National Rural Health Alliance, Inc.; c2013 [updated 2012 January; cited 2013 April 20]. Available from <http://nrha.ruralhealth.org.au/cms/uploads/factsheets/fact-sheet-08-cancer.pdf>.
22. Hanks H, Veitch PC, Harris, MF. A rural/urban comparison of the roles of the general practitioner in colorectal cancer management. *Aust J Rural Health*. 2008;16:376 – 382.
23. McCarthy A, Hegney D, Brown L, Gilbar P, Brodrigg TM, Swales J. Characteristics of chemotherapy practice in rural and remote area health facilities in Queensland. *Aust J Rural Health*. 2003;11:138 – 144.
24. Adams P, Hardwick J, Embree V, Sinclair S, Conn B, Bishop J. Models of Cancer Services for Rural and Remote Communities. Sydney: Cancer Institute NSW; 2009.
25. Australian Government Department of Health and Ageing [Internet]. Cancer Australia; c2013 [updated 2013 May 1; cited 2013 April 20]. Available from <http://www.cancerlearning.gov.au/about/index.php>.
26. Hoon EA, Newbury JW, Chapman P, Price J. Education to improve cancer care in rural South Australia. *Rural & Remote Health*. 2009;9:1-10.
27. Cancer Council Australia [Internet]. [updated 2013 February 4; cited 2013 April 22] Available from <http://www.cancer.org.au/news/news-articles/new-network-to-push-indigenous-cancer-into-the-spotlight.html>.
28. Saunders V, Elston J, Gennat H. Early detection and management of breast and cervical cancer in Aboriginal and Torres Strait Islander women: Supporting the role of the General Practitioner. School of Public Health and Tropical Medicine, James Cook University; 2002.
29. Australian Indigenous HealthInfoNet [Internet]. Australian Indigenous HealthInfoNet; c2013. [updated 2009 August 11; cited 2013 April 21]. Available from <http://www.healthinonet.edu.edu.au/chronic-conditions/cancer/reviews/our-review>.
30. Condon JR, Cunningham J, Barnes T, Armstrong BK, Selva-Nayagam S. Cancer diagnosis and treatment in the Northern Territory: assessing health service performance for indigenous Australians. *Intern Med J*. 2006;36:498 – 505.
31. National Indigenous Cancer Network [Internet]. [cited 2013 April 21]. Available from <http://www.nican.org.au/>.
32. Cancer Council Australia. Ideal Oncology Curriculum for Medical Schools. Sydney: The Cancer Council Australia; 2007.
33. Royal Australian College of General Practitioners The RACGP Curriculum for Australian General Practice 2011: Oncology. Melbourne: The Royal Australian College of General Practitioners; 2011.

MOGA NOVARTIS ONCOLOGY CANCER ACHIEVEMENT AWARD 2013

The Medical Oncology Group of Australia, together with Novartis Oncology, presents the Cancer Achievement Award to recognise an outstanding contribution to Australian cancer research and control. The award formally recognises the contributions made by scientists, clinicians and other health care professionals to the scientific study of cancer in Australia.

Since 1999, this award has been presented to 14 leaders in the field of Australian medical research, oncology and related disciplines. The recipient of the 2013 Award was Professor Frances M. Boyle AM, Director of the Patricia Ritchie Centre for Cancer Care and Research, The Mater in Sydney, Professor of Medical Oncology at the Sydney Medical School and the Northern Clinical School, Conjoint Professor of Medical Oncology at the University of Newcastle, Medical Director of the Pam McLean Centre, University of Sydney and, Chair of the Board of Directors of the Australia and New Zealand Breast Cancer Trials Group.

The award was received by Professor Boyle at the Medical Oncology Group of Australia Annual Scientific Meeting in Melbourne on 2nd August 2013, at which she delivered the following address.

Frances M Boyle AM

Director, Patricia Ritchie Centre for Cancer Care and Research, Mater Hospital, Rocklands Rd, North Sydney.
Email: frances.boyle@sydney.edu.au



From left to right: Dr Rosemary Harrup, Deputy Chairman of MOGA, Professor Fran Boyle, recipient of the Cancer Achievement Award 2013, and Peter Murphy from Novartis Oncology.

I would like to thank the Medical Oncology Group and Novartis for this great honour, which has given me an opportunity to reflect upon much that I have learnt during the past 23 years as a member of this band of ‘fellow travellers’, and to share some of those thoughts with you today.

I left the Mater in Brisbane to begin my medical oncology training at Royal North Shore Hospital in 1990. At the end of the first week, John Levi, who was Head of Department said to me (at the Friday night wine tasting which was then a very pleasant feature of RNSH life): “It’s obvious you are going to be able to look after the patients, so what else

are you going to do for medical oncology?” I would love to say the heavens opened and I saw a vision of my life as it is now – instead history records that I said: “Anything that does not involve mice”. A decade later, after a PhD full of rats, and involvement with the Medical Oncology Group of Australia (MOGA) executive and communication skills training, Royal Australasian College of Physicians Scientific Advisory Committee, Clinical Oncology Society of Australia, National Breast Cancer Centre, Australia and New Zealand Breast Cancer Trials Group, Australian Cancer Network and Breast Cancer Network Australia, I wondered whether the mice might have been easier to manage!

AWARDS

In 2003, looking for a quieter life, I accepted a commission from the National Breast Cancer Centre to develop a communication training program for members of multidisciplinary cancer teams, which were at that time being formalised around the country. At the Pam McLean Centre, we had been working for some years to improve doctor-patient communication, so this seemed like a natural extension. Three months into the project we realised that the quality of the evidence base was woefully inadequate, and we were forced to resort to expert opinion.

I volunteered my experiences of teamwork gleaned from years of singing in a liturgical choir, but my colleague Prof Stewart Dunn pointed out that no lives were ever lost during a Palestrina Motet or Byrd Mass, however out of tune. "Cancer care was much more dangerous," he asserted. Take rugby, the game they play in heaven, and which he had played and coached. Drawing on the World Cup, then playing itself out to a devastating conclusion in Australia, we built a model of cancer teamwork based on rugby.¹ Clearly the All Blacks were metastatic melanoma, menacing yet occasionally brittle. England was Her2 positive breast cancer, with just one driver mutation, Jonny Wilkinson. The patient was the ball (since it is the ball that scores, gaining points for both survival and quality of life). The surgeon was the hooker gaining possession, propped up by radiology and pathology, after the GP feeds the scrum. The medical oncologist was the open-side breakaway, the radiation oncologist the blindside breakaway, the breast care nurse steered the big egos at number 8, and the back line did all the running and scoring. But where were the family and friends? Just cheering on the sidelines? And what about the pharmaceutical industry? Only active in the dressing room? And how was this going to be understood in Victoria?

Fortunately for our project plan, on Boxing Day 2003 the final film in Peter Jackson's Lord of the Rings Trilogy was released. As I watched Frodo climbing Mt Doom to destroy the ring, I was reminded of how patients struggle through the last cycles of chemotherapy, unable to "recall the taste of food or the sound of water".² Then when he returns to the Shire, he asks: "How do you pick up the threads of an old life...there are some things that time cannot mend."² – the survivor issues which we were beginning to realise as the lingering aftermath of cancer treatment. And when the story ends with Frodo going 'into the west', was he dying as a consequence of late toxicity, or taking up dragon boating to begin his rehabilitation?

Into my office that week came Jennifer, at the end of six cycles of chemotherapy, with her partner. She too had seen the film with her nephews, and pulling off her beanie, confided that they had remarked that she looked like Gollum. Thin face, grey skin, three strands of hair – the likeness was remarkable. Horrified, I asked if she felt that way (since things do not end well for Gollum in the story). "Ah no," she said. "I am Frodo, and I'm going to be ok, because I had Sam with me." She identified the key role her partner had played in keeping her going, keeping up her hopes, nagging and dragging her to eat and treat.

"Where were the professionals in your story?" I asked, thinking perhaps I had been at least a little helpful to her. "Outside the black gates, where they should be, looking

at the big picture and thinking strategically, caring from a distance and as a team," she said. And we began together to identify the members of the Fellowship – they were all there and accessible to anyone (even Victorians), who had read Tolkein's beloved books or watched the films. This was the fastest *Journal of Clinical Oncology* publication I ever wrote and the reviewers even added a few characters to the story:³

- Aragorn the lead surgeon, with the big sword and beautiful eyes, working closely with Arwen the care coordinator (best if they keep it professional till the work is done).
- Legolas the medical oncologist - agile, reflective, loyal, a great listener and visionary, targeting with his elvish arrows from afar.
- Gimli the radiation oncologist, comfortable underground, technologically savvy, undaunted by hopeless odds.
- Gandalf the venerable family physician, who runs the initial diagnostics and makes the referral to Rivendell, drops out for a bit when the hospital team take over, but picks up the pieces in the end.
- Elrond the diagnostician, interpreting the signature on the ring, so we know how it might be unmade.
- The inventive Elves of Lothlorien, protective of their secrets, but ultimately producing the critical new tools for Frodo's survival.
- Faramir the psychologist, offering Frodo understanding in the wilderness and facilitating his decision-making.

So we reconfigured our model, and in the decade since have dipped many times into aspects of this archetypal story of fellowship in the face of supreme challenge. I offer you today 10 unofficial guidelines for improving your effectiveness as a medical oncologist in a cancer care team.

1. Find (or become) Aragorn. True leadership is based on more than technical brilliance. Coupled with a respect for and knowledge of history and the literature, an ability to cut through to find new solutions is vital. Collaborating with wizards, he is resilient and always hopeful. As our fellowship lines up outside the black gates, we want to be following someone with an ability to inspire unity, courage and sacrifice, and to focus on the patient amidst the big picture. If you are uncertain of your own Aragorn potential, and someone you trust hands you a really big sword, 'lean in' as Sheryl Sandberg would say and give it a swing.⁴ You will become what you were meant to be by doing it.
2. Beware the divisive team member. Boromir, although brave and skilled, focuses on his own needs. Unwilling to accept leadership, he is disruptive in the multidisciplinary team meeting (the Council of Elrond), has intimidating body language which frightens Frodo, and fails to see that Frodo must choose his own course. He is at risk of litigation and if he cannot be reformed, should be offered a dignified farewell. Better without, than besieged from within.
3. Be focused by the dwarves. Legolas and Gimli start

the story as rivals based on historical enmities, but end up side by side as friends.² Radiation oncologists are robust in defence of patients quality of life. "Certainty of death, small chance of success, what are we waiting for?" says Gimli.² The reason nobody tosses the dwarf,⁵ is that they keep accurate account of their activities. They also understand the value of treasure and technology. As my great friend and fellow Brisbane escapee, Dr Susan Pendlebury says: "A problem that can be solved with money is not a real problem."

4. Partner with consumers to improve care. Bilbo, who has carried the ring before, and lived to write the tale, is equipped to offer Frodo insights that no-one else can. He offers an endorsement of the team, the protective body armour of experience, and a sword that functions as an early warning system. Not only did he survive his challenges, he was enriched by them, a powerful message of hope. I personally owe a great debt to Lyn Swinburne, founder of Breast Cancer Network Australia and partner in advocacy with MOGA, about whom Galadriel's words must surely be recalled: "Even the smallest person can change the course of the future."⁵
5. Interact wisely with the Elves of Lothlorien. The industry are natural kin to Legolas, with a shared history of research and passion for innovation. When we are engaged in clinical trials, it is important to recall the trust that Frodo puts in all of us. Galadriel herself reminds us that; "The quest stands on the edge of a knife. Stray but a little and it will fail, to the ruin of us all. Yet hope remains, while the company is true."⁵
6. Incorporate a psychologist into your team. They will be able to offer insights into patients' and families' needs and behaviours, so that we can adjust our plans. In addition, they will be able to assist us when we suffer with our patients and recognise the early signs of burnout and exhaustion, supporting troubled team members in the Houses of Healing.
7. Improve your own communication skills, which need to be honed constantly as new challenges arise. Legolas has a tendency to lapse into Elvish when the prognosis is poor, and needs to be reminded by Aragorn to drop the jargon and the despair and get with the program at Helm's Deep.⁶ Read our colleague Ranjana Srivastava's wonderful book, *Dying for a chat*,⁷ if you are in any doubt. Aragorn also masters that most useful tool, the crystal ball (palantir), and I would recommend that every oncologist install one on their desk. It is an inexpensive aid that assists patients to ask questions about what is most important to them.
8. Recognise when you have strayed on to Mt Doom. Some patients don't have a Sam at all, or may need us to step into hotter emotional territory at some points in the journey, empathising to facilitate their care. As time goes on, I am better at knowing when this is happening, choosing more deliberately the extent of engagement, and booking the eagles ahead of time to get me back out again. We can only continue to safely do what we do, standing so close to suffering and death, because we trust our fellows and are watching each other's backs.

9. Respect each other's time. Gandalf reminds Frodo: "All we have to decide is what to do with the time given to us."⁵ We each have only 168 hours in a week, and can cope with pressure or volume within that constant, not both simultaneously – this is a manifestation of Boyle's law of gases, but it holds true of our teams, which won't function well when overloaded or wasting time. As family life ebbs and flows, we will also need leeway from our teams to manage other responsibilities.
10. Celebrate along the way. It's an epic story with an ultimately ambiguous ending. Merry and Pippin have to stop a few times to "...sit on the field of victory, enjoying a few well earned comforts."² Many patients won't know they are cured for years, and New England journal publications are few and far between, but we can celebrate the chemotherapy finished, scans cleared, hair regrown, important milestones reached, and trials accrued. We spend a lot of time learning to break bad news, but could afford to share good news with less reservation. Fortunately, Legolas has a legendary capacity to hold his drink.⁶

I would like in closing to pay tribute to my home team of Michael, Clare and Leo Hennessy, who have accompanied me in this journey of discovery in Middle Earth. Family holidays arranged around Lord of the Rings film locations, and early onset weapons training are just a few of the consequences of my parenting style, so it is a relief that we have all survived. Thanks also to the many clinicians and my long suffering breast cancer team at the Mater, who have allowed themselves to be swept up in the story and photographed in costume for this project. One of the best moments was smuggling Anduril into the College of Surgeons meeting in a poster tube, and asking great surgeons to "just be Aragorn for me for a minute, before security pounces." They never hesitated. The creative team at the Pam McLean Centre - Stewart Dunn, Paul Heinrich and Jennie Dibley - are legends and friends.

In closing, I often ponder the words of Gandalf: "Some believe it is only great power that can keep evil in check. But that is not what I have found. It is the small, everyday deeds of ordinary folk who keep the darkness at bay. Acts of kindness and love".⁸

Thank you.

References

1. Boyle FM, Robinson E, Heinrich P, Dunn SM. Cancer: Communicating in the team game. *ANZ J Surg.* 2004;74:477-481
2. The Lord of the Rings. The Return of the King. New Line Cinemas 2003.
3. Boyle FM, Robinson E, Dunn SM, Heinrich P. Multidisciplinary Care in Cancer: The fellowship of the ring. *Journal of Clinical Oncology.* 2005;23:916-920
4. Sandberg S. Lean in. Random House, Australia, 2013.
5. The Lord of the Rings. The Fellowship of the Ring. Peter Jackson. New Line Cinemas. 2001
6. Srivastava R. *Dying for a chat*. Penguin 2012
7. The Lord of the Rings. The Two Towers. Peter Jackson. New Line Cinemas 2002
8. The Hobbit. Peter Jackson. New Line Cinemas 2012

AUSTRALIAN BEHAVIOURAL RESEARCH IN CANCER

Newcastle Cancer Control Collaborative (New-3C) New South Wales

Using e-health to deliver patient-centred cancer care

There is growing recognition that the delivery of healthcare should embrace innovations that occur in our society, such as the mainstream use of electronic devices and digital media. When our group pioneered the use of touchscreen computers for health behaviour research in the mid-1990s, new software programs had to be developed and existing hardware modified. The size of the touchscreen computers made portability between health settings impossible and posed significant problems in achieving privacy for patients participating in research studies. There was considerable concern that patients would not be able to use the equipment or feel comfortable with its applications. Some 20 years later, the use of electronic mechanisms for collecting and transferring health information to both patients and health care providers is highly acceptable and increasingly widespread.

Electronic approaches offer a number of advantages over static approaches including:

(1) Multimodal information presentation. Complex information can be presented using a variety of formats including audio and visual (written, graphics, video). Compared to words and numbers, information presented pictorially is processed more rapidly and recalled more readily.

(2) Tailoring of information. Information can be tailored to the particular characteristics of the user, such as language, age, gender, socio-economic status, health problems and role (patient, caregiver, health care provider). Information can also be layered to accommodate individual differences in the amount and type of information preferred.

(3) Rapid updating of content. With the large volume of research produced annually, printed materials quickly become out-of-date. Electronic formats allow content to be updated centrally and routinely as the latest evidence becomes available.

(4) Access. An increasingly large proportion of the population has access to and utilises digital technology such as the internet and hand-held electronic devices. This means that information can be collected and conveyed regardless of setting, geographic location, time of day or health status.

Our group is applying e-health in a suite of research projects to improve the quality of care provided to cancer patients across the following themes:

(1) Risk assessment. We are using portable tablets to assess cancer risk factors and promote health behaviours among patients presenting to general practice and Aboriginal Medical Services.

(2) Shared decision-making. In collaboration with nine

cancer treatment centres, we are using portable tablets to test the effectiveness of providing haematological cancer patients with multimedia information about the technical and psychosocial aspects of their care. The flexibility of the e-health approach is demonstrated by the clinician tailoring the information made available to each individual patient based on their diagnosis.

(3) Communication. We are using portable tablets to present standardised filmed vignettes to patients and their significant others to facilitate discussions about preferences for end of life care. The program allows patients' care preferences to be stored, which can then be accessed and modified by patients at any time.

(4) Social support. In collaboration with Cancer Council Helpline, we are testing the effectiveness of providing information and support to lung cancer patients via live chat with a trained oncology nurse consultant.

Behavioural Research and Evaluation Unit (BREU), South Australia

Intervention to reduce carer burden and depression among carers of cancer patients

Carers of cancer patients provide extended and often unrecognised support to hundreds of thousands of Australians each year. Over half of carers report depression and/or anxiety and one-third report feelings of excessive burden. However, there are few professional services or supportive care structures to accommodate their needs.

Cancer Council SA, in partnership with Deakin University, Cancer Council Victoria, Royal Adelaide Hospital, Epworth Healthcare, Eastern Health, Barwon Health, Carers Victoria, North Eastern Metropolitan Integrated Cancer Service and Barwon South Western Regional Integrated Cancer Service, have commenced recruitment for a randomised control trial that will test the effectiveness of a telephone based intervention to reduce carer burden and depression among carers of cancer patients. The study is being funded by the National Health and Medical Research Council.

This study will test the hypothesis that excessive carer burden is modifiable through a telephone intervention that involves taking an established and highly successful service for cancer patients (Cancer Council Helpline) and expanding it to support carers of cancer patients. The intervention comprises:

a) a proactive and structured outcall program of information and support, delivered by experienced helpline nurses to carers, that links them to a range of community based supportive care services as required;

b) screening carers for distress and referring those with elevated levels for follow up psychological services.

With the ageing of the population, we can expect to see a significant increase in the number of people diagnosed with cancer and living with the disease, which will result in

significant numbers of carers caring for cancer patients. This study will impact on the health outcomes among carers, which could potentially be generalised across different chronic disease groups.

Sun protection and SunSmart schools membership in South Australian primary schools

Cancer Council SA recently conducted in-depth telephone interviews with 23 principals of primary schools in South Australia who were not currently members of the National SunSmart Schools Program. The aim of the research was to explore principals' knowledge and perceptions of the SunSmart Schools Program, the current sun protection practices in non-SunSmart schools, and any barriers to improving various sun protection practices in primary schools. The research was conducted in order to develop strategies to increase engagement with primary schools in South Australia and to improve the promotion of comprehensive sun protection practices via the National SunSmart Schools Program.

Preliminary results suggest that the majority of principals had heard of the program before, that the SunSmart Schools Program was perceived positively, and that there was high support among principals to streamline the three-yearly membership review process. In addition, the majority of schools had effective sun protection practices in place, particularly with regard to Cancer Council approved styles of hats and adequate shade. A term-based system of sun protection was viewed as being convenient and easy to understand, and the incompatibility of this with Cancer Council SA guidelines was the most salient barrier to joining the SunSmart Schools Program. These results will now be used to inform engagement with primary schools to assist them in overcoming barriers to adopting comprehensive sun protection strategies.

Centre for Behavioural Research in Cancer (CBRC), Victoria

What is the role of tobacco control advertising intensity and duration in reducing adolescent smoking prevalence?

While tobacco control mass media campaigns can reduce adolescent smoking, little is known about the most effective advertising broadcast strategies to achieve this outcome. This National Health and Medical Research Council funded study, examined how intensity and duration of tobacco control advertising relates to adolescent smoking prevalence, using data from Australian secondary school students participating in national cross-sectional surveys, conducted triennially between 1993 and 2008 (sample size range: 12,314 to 16,611).

For each student, monthly targeted rating points (TRPs, a measure of television advertising exposure) for tobacco control advertising were calculated for the three and 12 months prior to surveying. For each time period, cumulative TRPs exposure and exposure to three intensity levels (≥ 100 TRPs/month; ≥ 400 TRPs/month; ≥ 800 TRPs/month), over increasing durations (e.g. one month, two months, etc.) were calculated. Logistic regression examined associations between TRPs and students' smoking in the previous four weeks, after controlling for demographic and policy variables. Exposure to ≥ 400 TRPs/month and ≥ 800 TRPs/month were both associated with reduced smoking, although the duration needed for this effect differed for the two intensity levels. Advertising at a moderate intensity (≥ 400 TRPs/month) was associated with reduced smoking, but only if maintained on a monthly basis, whereas advertising at a high intensity (≥ 800 TRPs/month) was effective even if this level was not maintained every month. These findings indicate that both anti-smoking advertising intensity and duration are important for ensuring reductions in adolescent smoking prevalence.

Unmet support needs and distress among women with a BRCA1/2 mutation

Women who carry a mutation in one of the breast/ovarian cancer genes, BRCA1 or BRCA2, can have similar distress levels to breast cancer patients. However, the association between unmet needs and psychological distress among this group is unclear. This study, funded by the National Breast Cancer Foundation, aimed to: (1) describe the unmet support needs of women with a known BRCA1/2 mutation; (2) determine how unmet needs are related to psychological distress; and (3) identify variables that predict level of unmet need and distress. Female BRCA1/2 mutation carriers ($n=279$), identified through Familial Cancer Centres in three states, completed surveys assessing need for help on 16 information and support items, and the Impact of Events Scale (IES), to measure level of distress to their positive genetic test result. Participants reported an average of 5.4 moderate to very high unmet needs, while 21% had scores indicating moderate distress and 13% indicating severe distress. Predictors of higher levels of unmet need were younger age, shorter time since notification of mutation status and not having someone to confide in. Higher levels of unmet need were associated with higher levels of distress. These findings indicate the supportive care needs of many BRCA1/2 mutation carriers are not being addressed through standard genetic counselling sessions. Identifying appropriate interventions that target commonly identified unmet needs, and determining what extra services are needed for this potentially vulnerable group may be worthwhile. For further information, contact: A/Prof Victoria White (Vicki.White@cancervic.org.au).

CANCER COUNCIL AUSTRALIA

Coalition makes major commitment to bowel cancer screening – 35,000 lives saved

The Coalition made a commitment in August to complete the National Bowel Cancer Screening Program by 2020, potentially saving 35,000 lives over the next 40 years, according to Cancer Council Australia.

Cancer Council Australia CEO, Professor Ian Olver, congratulated Shadow Health Minister Peter Dutton on the announcement, which included a \$46 million commitment to add two new age groups to the screening program from 2015.

Under the Coalition plan, the remaining age groups would be added over the following five years, making bowel cancer screening available every two years for all Australians aged 50 to 74.

Professor Olver said the Coalition's commitment was the best thing any future Australian government could do to reduce the nation's cancer burden.

"Bowel cancer is the second biggest cancer killer in Australia, yet it can usually be treated successfully if caught early," he said.

Patent system changes a step in the right direction

The Federal Government announced safeguards in May to protect consumers from commercial monopolies over vital services such as genetic testing for cancer risk.

Professor Olver said he welcomed a bill that would clarify the application of Crown use provisions to help ensure that patent enforcement claims could not prevent governments from providing vital healthcare services.

"Back in 2008, the commercial licensee for patents on the BRCA1 and BRCA2 breast and ovarian cancer genes sought to enforce its patent claims over the state and territory laboratories that were providing those tests as a public service," Professor Olver said.

"This bill will serve to clarify the Patents Acts in respect to Crown use provisions.

The Government recognised that more work is necessary to achieve a balance between rewarding innovation and ensuring equitable access to medical technology. "

World No Tobacco Day an ideal time to commit globally to plain packaging

Cancer Council Australia and the National Heart Foundation of Australia commended the Irish Government in May for moving towards plain packaging of tobacco products, and called on future Australia governments to continue defending our landmark laws from international legal challenges.

"Already we are seeing anecdotal evidence of plain packages deterring smokers in Australia, which helps to explain why the tobacco industry is so opposed to the concept," Professor Olver said.

CEO of the National Heart Foundation of Australia, Dr Lyn Roberts, said the most powerful opponents of plain packaging were the tobacco companies who profit from addicting new smokers.

"In view of Australia's leadership role and the bipartisan support for plain packaging, it's critical that Australian governments continue to defend the integrity of laws with such great potential to save lives," said Dr Roberts.

The theme of World No Tobacco Day in 2013 was "Ban tobacco advertising, promotion and sponsorship".

Cancer Council welcomes landmark US ruling on gene patents

Cancer Council Australia believes the US Supreme Court's ruling that human genes cannot be patented provides a precedent for the Australian Government to change the Patents Act.

The ruling, based on the premise that genetic materials are not inventions, provides clarity for Australian policy makers.

Professor Olver welcomed the decision and said it addressed the issue of commercial monopolies over genetic mutations vital to cancer prevention, diagnosis and treatment.

This newfound clarity would have prevented the 2008 issue where the Australian licensee for the BRCA1 and BRCA2 patents demanded public laboratories cease conducting the tests.

"We welcome innovation in medical research, which should be rewarded by a robust patents system," Professor Olver said. "However, discovery and isolating genetic material is not innovation."

New food labels will guide healthier choices

Cancer Council Australia welcomed the decision in June to introduce a new health star rating scheme and for it to be made mandatory if it is not widely adopted by food companies within two years.

The decision, made by an intergovernmental forum on food policy, will allow Australians to make more informed, healthy food choices.

Australia is facing a significant increase in cancers caused by obesity and food choices remains one of the key factors behind the anticipated rise.

Professor Olver noted that many people want to make healthier choices, but research demonstrated the current food labelling system was unclear and confusing.

"The health star rating system provides a clear, overall indication based on the amount of sugars, saturated fats and salt in packaged food," he said. Basing the ratings on 100 gram servings, the scheme will enable consumers to make direct comparisons between products.

"We look forward to seeing the food companies adopt the new scheme to support the provision of clearer product information to their customers," said Professor Olver.

Tobacco excise increase could save 100,000 lives

Cancer Council Australia has estimated up to 100,000 lives could be saved by the cumulative effect of the Australian Government's 12.5% recurrent increase in tobacco excise in August.

Estimates based on the impact of price on smoking prevalence show the excise increases would prompt around 210,000 Australian smokers to quit.

"More than half of all long-term smokers will die prematurely of a smoking-caused disease," Professor Olver said.

"So if people who are prompted to quit by the measure would otherwise have smoked long-term, we can estimate that up to a 100,000 Australians can avoid a premature death."

Further projections estimate at least 40,000 young people between 12 and 17 would also be deterred from smoking, making the 100,000 potentially avoided deaths a conservative prediction.

The excise, along with strict plain packaging laws, marks another strong measure taken by the Australian Government to rid the country of tobacco-caused burdens such as cancer.

Professor Olver said increasing the cost of tobacco products was particularly effective for young people and those on lower incomes, who bear the brunt of the tobacco disease burden in Australia.

Cancer Council publishes new SunSmart position statements

Cancer Council Australia has published two new position statements on sun safety for infants and window tinting.

Babies aged 0 – 12 months have sensitive skin that burns easily. Cancer Council's latest statement considers the medical and scientific evidence available in order to provide an overview of measures that should be taken to protect babies skin, while balancing vitamin D requirements.

The second position statement reviews the role that window tinting plays in blocking out harmful UV light. The statement outlines that in general, UV radiation through the windows of buildings and cars poses little health risk to people unless they are spending extended periods of time close to windows that receive direct sun.

Cancer Council recommends that people who spend long periods of time in a vehicle when the UV index levels are at 3 or above, use a combination of sun protection measures, such as long sleeved clothing, sunglasses and sunscreen that is SPF 30 or higher. The statement suggests that the need for window tinting on car and building glass should be considered with regard to the risks to the occupants.

CLINICAL GUIDELINES NETWORK

Cancer Council Australia's Clinical Guidelines Network has a number of new guidelines in development, as well as transiting existing guidelines to its Cancer Guidelines Wiki platform wiki.cancer.org.au

Cancer Council Australia CEO, Professor Ian Olver, attended the Guidelines International Network (GIN) conference held in San Francisco in August as a plenary speaker, presenting 'the Wiki approach to keeping guidelines up to date'.

New guidelines in development

Clinical practice guidelines for the management of sarcoma

Draft guidelines were released on the Cancer Guidelines Wiki for public consultation in September. Comments were reviewed and addressed by the working party and Cancer Council Australia and the Australasian Sarcoma Study Group expect to launch the final guidelines on the Cancer Guidelines Wiki in November.

Clinical practice guidelines for the diagnosis and management of Barrett's oesophagus and mucosal neoplasia

Working party authors have been assessing the literature and developing their topic content and evidence-based recommendations. The draft guidelines are planned to be released on the Cancer Guidelines Wiki for public consultation in 2014.

Clinical Practice Guidelines for PSA testing and management of test-detected prostate cancer

These guidelines have been undergoing a systematic literature review and are being developed to meet the National Health and Medical Research Council standard for approval. Upon completion of the literature review, the Expert Advisory Panel will develop draft content and formulate evidence-based recommendations. Cancer Council Australia together with the Prostate Cancer Foundation of Australia, aim to release the draft guidelines for public consultation by mid-2014.

Guidelines currently under revision

Clinical practice guidelines for the prevention, diagnosis and management of lung cancer

Revision of the prevention and diagnosis sections of the 2004 guidelines is progressing. The working party has developed topic groups, key clinical questions and search strategies for the guidelines. When the literature searches

are completed, the results will be distributed to working party authors for their critical assessment.

For more information on clinical guidelines, contact Christine Vuletich, Clinical Guidelines Network Manager, on 02 8063 4100 or christine.vuletich@cancer.org.au

Clinical practice guidelines are available at wiki.cancer.org.au

CLINICAL ONCOLOGY SOCIETY OF AUSTRALIA, COSA

Annual Scientific Meeting (ASM)

I do hope that by the time you read this you will have already attended the 40th COSA ASM in Adelaide. Our convenor, Nimit Singhal, and his program committee brought together a comprehensive program featuring gastro-intestinal cancers and geriatric oncology – an emerging area of interest for COSA members and the theme for this edition of *Cancer Forum*. We were delighted to welcome such a strong contingent of international and national speakers.

COSA is proud to announce that in 2014, the 41st COSA ASM will be held in conjunction with the UICC World Cancer Congress, in the first week of December at the Melbourne Convention and Exhibition Centre. The COSA ASM will run 1-3 December, and World Cancer Congress 3-5 December, with Thursday (5th) being a joint day. We anticipate delegates will register for either the COSA ASM or the World Cancer Congress, with a discount offered if people register for both, and on the joint day delegates will be free to move between each conference regardless of registration.

The theme for COSA's 41st ASM will highlight cancer survivorship, supportive care and palliative care – all important areas of interest for COSA members, and hopefully attractive to World Cancer Congress delegates.

Associate Professor Mei Krishnasamy has graciously agreed to act as convenor for the 2014 COSA ASM. Mei is currently Director of Cancer Nursing Practice and Research and Director of the Department of Cancer Experiences Research at Peter MacCallum Cancer Centre, Melbourne, and COSA President Elect. COSA is delighted to have Mei's enthusiasm and experience lead the 2014 ASM program.

Access to chemotherapy drugs

Acting on the recommendations from the Senate inquiry into access to chemotherapy drugs such as docetaxel, the Department of Health and Ageing released a subsequent discussion paper and called for submissions, particularly seeking detailed information regarding institutional preparation and administration of chemotherapies.

The detail required was beyond the scope for COSA; we

therefore made a brief submission reiterating our original recommendations outlining the wide ranging ramifications of the PBS price disclosure cuts. The issues are primarily weighted toward the private sector, yet there are impacts on public health institutions.

COSA met with the review panel in August – a commentary from that meeting will be included in my next report.

Leadership in improving cancer research

In recent months COSA has made two submissions on behalf of our members particularly relating to cancer research:

a) 'The Independent Hospital Pricing Authority review of standard costing for clinical trials.' COSA's submission to this review was in collaboration with the Cancer Cooperative Trials Groups (CCTGs). Our joint submission highlighted the fact that CCTGs focus on important scientific questions without commercial considerations as a key focus. Many of these trials are randomised, comparing standard of care to an experimental arm. Funding for CCTG trials is often limited and it is challenging to fund both the costs for the experimental arm and standard of care.

b) 'The National Health and Medical Research Council's public consultation on proposed revisions to consent in the National Statement on Ethical Conduct of Human Research.' In this submission, COSA supported the need for a combination of ways to secure consent as a pragmatic and flexible approach, noting the option for opt-out consent would provide ethical review bodies with an additional tool to apply to low risk research such as clinical registries.

Complementary and integrative therapies

In May, COSA released a position statement for health care professionals supporting the use of complementary and alternative medicine by cancer patients. This document has already received significant support and is being referenced nationally and internationally, and can be downloaded at cosa.org.au

Marie Malica, Executive Officer

FACULTY OF RADIATION ONCOLOGY, RANZCR

Radiation oncology communications campaign

The faculty has launched a campaign to increase the public awareness of radiation oncology by promoting the clinical effectiveness of radiation therapy as a cancer treatment modality, as well as the contribution of radiation oncologists, radiation therapists and radiation oncology medical physicists as the key professions in cancer care arena.

The campaign was launched with a clear proposition and brand, and involves a series of public relations activities with consumers, advocacy groups and other healthcare professionals. The faculty values endorsement and support from our stakeholders for this initiative. Any suggestion/idea is welcomed by the faculty, so please email us at faculty@ranzcr.edu.au.

Tripartite consumer forum and stakeholders meeting

On behalf of tripartite committee, the faculty convened a consumer forum in August in Sydney, with the aims of educating an interested and informed consumer panel about radiation oncology and the tripartite plan, and enlisting their suggestions. It is also expected the consumer panel will educate other consumers, and become advocates for radiation oncology.

The Department of Health and Ageing has also agreed to call and host a meeting of key stakeholders nationally to discuss priorities in radiation oncology and to develop the implementation strategy for the plan. This is likely to be held in November, and will bring together all the disciplines contributing to cancer care to develop a cohesive approach. Consumer inputs will strengthen the tripartite position in the discussions.

Those two meetings will encourage collaboration between Governments, service providers, the professions, advocates, and consumers, which is critical to the implementation of the tripartite national strategic plan for radiation oncology.

Radiation oncology practice standards

Following a successful launch of the Australian tripartite radiation oncology practice standards in 2011, discussions were held around the best way to implement the standards. The faculty has provided its view to the Department of Health and Ageing that it is essential that a full set of standards is implemented across all radiation therapy facilities in Australia.

Recently, Queensland Health adopted the tripartite radiation oncology practice standards as the quality standards for both public and private radiation therapy treatment facilities across the state. It is anticipated that the standards will be

incorporated into Queensland's statewide cancer strategic plan.

This initiative will undoubtedly add a level of safety and public confidence for radiation oncology departments. The faculty and tripartite committee will encourage the implementation and endorsement of the standards by all states and territories.

Radiation oncology incident reporting system

The Department of Health and Ageing recently released a report on the findings of a survey of incident reporting system used in Australian radiation oncology facilities. The survey by the Radiation Oncology Reform Implementation Committee quality working group provides a useful summary of the current status of incident reporting systems used in Australian radiation oncology facilities.

At the Radiation Oncology Safety Information System workshop held in Melbourne last year, there was consensus that incident reporting should become an essential part of standard radiation oncology practice in all facilities. There was agreement that Australian radiation oncology facilities would benefit from uniform reporting using identical classifications across Australia, and that all centres would benefit from access to national incident reporting data identifying benchmarks and trends.

In the tripartite national strategic plan for radiation oncology, one of the recommendations is that a national incident monitoring system specific to radiation oncology be implemented. This will require co-ordination by different levels of government and various stakeholders.

Innovative training and research initiatives

The faculty is exploring the possibility of collaborating with other medical colleges on introducing training programs for multidisciplinary workforce positions in cancer care. The main objective of this initiative is to provide other medical professionals, such as general practitioners, enhanced skills to be actively involved in cancer patient management.

The model of the 'clinician-scientist' has become more attractive as a means of combining specialist training with a formal research higher degree. There is a growing number of radiation oncologists seeking to engage with this model. The faculty is exploring how this may be accommodated alongside the standard clinical training requirements, to support and encourage trainees wishing to pursue this path. We are now in the process of developing a research higher degree program, which will enable trainees to undertake full-time research activities while maintaining the quality of clinical radiation oncology training.

Prof Gill Duchesne, Dean, Faculty of Radiation Oncology

MEDICAL ONCOLOGY GROUP OF AUSTRALIA, MOGA

MOGA's Annual Scientific Meeting - Blood, Biomarkers and Beyond, held in August in Melbourne focused on current research, clinical and professional oncology issues around biomarkers, their role in the routine management of patients with cancer and how they guide drug development. The scope of the scientific program extended well beyond biomarkers, to include sessions on: circulating tumours and stem cells; proteomics; next gen sequencing: plasma DNA; genomics; and an update on the 2015 study.

This combined with broad tumour type coverage and a strong line-up of five international and more than 23 Australian expert speakers and chairs, to attract a record number of delegates. Among the invited speakers, MOGA welcomed Professor Allen Chan (Hong Kong), Professor Mark J. Ratain (United States of America), Professor Caroline Robert (France) and Professor Amit M. Oza (Canada). MOGA also welcomed Professor Kazuo Tamura (President, Japan Society for Medical Oncology (JSMO)) and Professor Akita (Education Committee Chair, JSMO) as international speakers. MOGA and JSMO are developing future projects and activities of mutual interest, including plans for the MOGA Chairman to be a guest speaker at the JSMO Meeting in Sendai in September. In keeping with the association's efforts to build South East Asian regional networks, the meeting also attracted attendees from Taiwan, Cuba, Singapore and Hong Kong.

Highlights of the program included: industry symposia on 'Barriers to Access to Oncology Medicines in Australia' and 'Making Targeted Therapy possible for Ovarian Cancer'; tumour specific sessions, covering melanoma, lung, prostate, ovarian and gynaecological cancers, cancers of the unknown primary and ATCLL; a session on 'Who pays for high costs drugs?'; an Asia Pacific perspectives session; an update on guidelines for brain; metastases in breast cancer; a meeting on guideline development for safe handling of monoclonal antibodies; a focus group meeting to develop a chemotherapy phone app; consultant and trainee oral presentation sessions; and the 'Best of the Best Research 2013'.

MOGA has been the focus of strong interest from the media over the second quarter of the year, providing expert comment on a range of oncology issues. Drugs shortages and access issues continue to be high on the media agenda, in particular issues around oncology drugs and treatment that should be available in Australia but are not. The latter, of course, arises directly from the deferred and pending decisions through the Australian regulatory system.

There has also been significant progress with the associations' policy and advocacy work for oncology drugs and treatment. In June, MOGA made a submission to the Therapeutics Goods Administration consultation examining product information and consumer medicine information. The submission focused on long standing issues of concern to oncology professionals, including the notable gap between product information and actual clinical practice. MOGA continues to advocate for a new national pathway

for oncology drugs listing and product information changes for older agents. Notably, a submission is being developed for the listing of tamoxifen for breast cancer prevention in Australia, to align with recent developments in the UK and recent publications highlighting the importance of SERMs in breast cancer prevention. These recent developments have provided additional support for the submission MOGA put to the regulators more than 18 months ago to advocate this important listing change.

At its last meeting, the Pharmaceutical Benefits Advisory Committee (PBAC) made a number of positive recommendations that reflect various positions advocated by MOGA including: extending the listing for lenalidomide to include treatment of transfusion dependent, low risk/INT-1, 5q-myelodysplastic syndrome on the basis of acceptable cost effectiveness compared with best supportive care; and the listing of vinorelbine tablets on the Pharmaceutical Benefits Scheme (PBS) as an authority required benefit for the treatment of advanced breast cancer, after failure of standard prior therapy which includes anthracyclines, on the basis of clinical need at the price offered in the submission. Most importantly, both ipilimumab and abiraterone, the subject of ongoing submissions and discussions by MOGA in the post PBAC phase at pending subsequent Cabinet as well as Ministerial approvals, have now gone through the system and been placed on the PBS.

MOGA has recently requested regulatory consideration be given to the large number of antibiotics that are not PBS listed, but are used extensively in a range of conditions in addition to oncological conditions. Some of these are used in areas such as soft tissue, bone infections and in penicillin sensitive patients where only one available drug exists, there are associated problems and where an alternate on the PBS is a priority.

MOGA recently provided the PBAC with a listing of essential oncology drugs we believe should never go into short supply in Australia. This list was developed with a focus on curative regimens and includes some supportive care drugs, antibiotics and anti-emetics. MOGA is currently developing additional information details of the regimen for each drug drawn from the EviQ database, so that current prices and costs for each regimen can be determined by the regulator and, if curative, survival benefits will also be considered.

MOGA's 10th anniversary Australia and Asia Pacific Clinical Research Development (ACORD) Workshop will be held from 14-20 September 2014 at Coolumb, Queensland. Confirmed partners include the American Association for Cancer Research, American Society for Clinical Oncology and Cancer Council Australia. This week-long intensive training program on clinical trials design for cancer researchers in all oncology subspecialties, from Australia and the Asia Pacific region, is the regional equivalent of programs run by the European Society for Medical Oncology and the American Society for Clinical Oncology.

The scientific program includes lectures and practicals, with daily plenary sessions providing an overview of a number

of relevant topics and skills, such as: ethics, statistics and quality of life; small group by methods and disciplines; concurrent discussions on each oncology discipline; protocol sessions to discuss individual protocols and provide feedback on participants' progress over the week; and office hours – one-on-one time with faculty members to discuss their protocol

ACORD is open to candidates with training in medical, radiation, gynaecological, paediatric, geriatric, surgical

oncology and psycho-oncology, palliative care, nursing, pharmacology, haematology, pathology and allied health disciplines. Registrations will open online at www.acord.org.au from 4 November 2013. Applicants must write and submit a short concept outline (<500 words) for a proposed clinical research project to be developed at the workshop, with supporting referee materials.

Associate Professor Gary Richardson - MOGA Chairman

CALENDAR OF MEETINGS

AUSTRALIA AND NEW ZEALAND

November

1-2	The Alfred General Surgery Meeting 2013	Melbourne, Victoria	RACS Conferences & Event Management Website: www.surgeons.org Email: alfred@surgeons.org Phone: +61 3 9249 1139
9-10	Clinical Oncology Society of Australia (COSA) Advanced Trainees Weekend	Adelaide, South Australia	ASN Events Pty Ltd Website: www.asnevents.net.au Email: eg@asnevents.net.au Phone: +61 3 5983 2400
12-14	Clinical Oncology Society of Australia's (COSA's) 40th Annual Scientific Meeting	Adelaide, South Australia	Clinical Oncology Society of Australia (COSA) Website: www.cosa.org.au Email: cosa@cancer.org.au Phone: +61 2 8063 4100
12-15	Australasian Leukaemia and Lymphoma Group (ALLG) Scientific Meeting	Sydney, New South Wales	Australasian Leukaemia and Lymphoma Group (ALLG) Website: www.allg.org.au Email: info@allg.org.au Phone: +61 3 9656 9011
21-24	Global Controversies and Advances in Skin Cancer Conference	Brisbane, Queensland	Cancer Council Queensland Website: www.gc-sc.org Email: admin@ccm.com.au Phone: + 61 7 3368 2644
22	The Second Annual Crown Princess Mary Cancer Centre Symposium	Sydney, New South Wales	Sydney West Translational Cancer Research Centre Website: www.sydneywest.org.au/symposium Email: pamela.provan@sydney.edu.au Phone: +61 02 9845 9561

2014

August

3-5	10th Australian Lymphology Association Conference	Auckland, New Zealand	Australasian Lymphology Association Website: www.alaconference.com.au Email: info@lymphology.asn.au Phone: +61 3 9895 4486
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September

14-19	Australia and Asia Pacific Clinical Oncology Research Development Workshop (ACORD)	Coolool, Queensland	Medical Oncology Group of Australia (MOGA) Website: www.moga.org.au Email: moga@moga.org.au Phone: +61 2 8247 6210
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November

8-11	15th Biennial Meeting of the International Gynaecological Cancer Society (IGCS)	Melbourne, Victoria	International Gynaecological Cancer Society (IGCS) Website: www.igcs.org Email: adminoffice@igcs.org Phone: +1 502 891 4575
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INTERNATIONAL

November

3-6	5th International Cancer Control Congress	Lima, Peru	International Conferences Service Ltd Website: www.iccc5.com Email: ccc2013@icsevents.com Phone: +1 604 681 2153
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CALENDAR OF MEETINGS

4-8	International Psycho-Oncology Society (IPOS) 15th World Congress of Psycho-Oncology	Rotterdam, The Netherlands	International Psycho-Oncology Society (IPOS) Website: www.ipos-society.org/ipos2013 Email: info@ipos-society.org Phone: +1 434 293 5350
6-8	Chemotherapy Foundation Symposium XXXI	New York, United States of America	The Chemotherapy Foundation Website: www.chemotherapyfoundationsymposium.org Email: jaclyn.silverman@mssm.edu Phone: +1 212 866 2813
7-8	2013 American Institute for Cancer Research (AICR) Annual Research Conference on Food, Nutrition, Physical Activity and Cancer	Bethesda, United States of America	American Institute for Cancer Research Website: www.aicr.org/cancer-research/conference Email: aicrweb@aicr.org Phone: +1 800 843 8114
7-9	Advanced Breast Cancer Second International Consensus Conference (ABC2)	Lisbon, Portugal	European School of Oncology (ESO) Website: www.abc-lisbon.org Email: eso@eso.net Phone: +39 02 85464 51
7-9	3rd Guangzhou International Symposium on Oncology	Guangzhou, China	Guangdong Anti-cancer Association Website: www.gzoenglish.sysucc.org.cn Email: gzco2011@163.com Phone: +86 20 87343138
21-24	African Organisation for Research and Training in Cancer (AORTIC)	Durban, South Africa	African Organisation for Research and Training in Cancer (AORTIC) Website: www.aortic-africa.org Email: info@aortic2013.org Phone: +27 21 689 5359
December			
6-8	Asia-Pacific Gastroenterology Cancer Summit 2013	Singapore	MCI – Dubai Office Website: www.apgcs.org Email: apgcs@mci-group.com Phone: +971 4 311 6300
10-14	36th Annual San Antonio Breast Cancer Symposium	San Antonio, United States of America	Cancer Therapy Website: www.sabcs.org/ Email: sabcs@uthscsa.edu Phone: +1 210 450 1550
2014			
March			
17-21	12th International Congress on Obesity	Kuala Lumpur, Malaysia	International Association for the Study of Obesity (IASO) Website: www.iaso.org/events/ico/ico-2014 Email: enquiries@iaso.org Phone: +44 20 7685 2580
May			
6-9	Royal Australasian College of Surgeons (RACS) Annual Scientific Congress 2014	Marina Bay Sands, Singapore	Royal Australasian College of Surgeons Website: www.surgeons.org Email: college.sec@surgeons.org Phone: +61 3 9249 1200
June			
12-14	European Society of Thoracic Imaging (ESTI) Annual Scientific Meeting	Amsterdam, The Netherlands	European Society of Thoracic Imaging (ESTI) Website: www.myesti.org Email: office@myESTI.org Phone: +43 1 5322165

CANCER COUNCIL AUSTRALIA

Cancer Council Australia is the nation's peak cancer control organisation.

Its members are the leading state and territory Cancer Councils, working together to undertake and fund cancer research, prevent and control cancer and provide information and support for people affected by cancer.



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CLINICAL ONCOLOGY SOCIETY OF AUSTRALIA

The Clinical Oncology Society of Australia (COSA) is a multidisciplinary society for health professionals working in cancer research or the treatment, rehabilitation or palliation of cancer patients.

It conducts an annual scientific meeting, seminars and educational activities related to current cancer issues. COSA is affiliated with Cancer Council Australia.



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MEMBERSHIP

Further information about COSA and membership applications are available from:

www.cosa.org.au or cosa@cancer.org.au

Membership fees for 2013
Medical Members: \$170
Non Medical Members: \$110 (includes GST)

COSA Groups

Adolescent & Young Adult
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Cancer Pharmacists
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Complementary & Integrative Therapies
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Radiation Oncology
Regional & Rural Oncology
Social Work
Surgical Oncology
Survivorship
Urologic Oncology

Information for contributors

Cancer Forum provides an avenue for communication between all those involved in the fight against cancer and especially seeks to promote contact across disciplinary barriers.

To this end articles need to be comprehensible to as wide a section of the readership as possible. Authors should provide sufficient introductory material to place their articles in context for those outside their field of specialisation.

Format

Cancer Forum welcomes original articles about medical, scientific, political, social, educational and administrative aspects of cancer control. All manuscripts should be submitted by email to info@cancerforum.org.au as MS Word documents.

Length: 2000-2500 words.

Font: Arial - 20pt for title, 12pt for headings and 10pt for text.

Following the title, include your full name, organisation and email address.

Include an introductory heading and sub-headings that describe the content.

Number pages in the footer.

Abstract

All manuscripts must include an abstract of approximately 200 words, providing a summary of the key findings or statements.

Illustrations

Photographs and line drawings can be submitted via email or on disk, preferably in tiff or jpeg format, or as transparencies or high quality prints.

If images are not owned by the author, written permission to reproduce the images should be provided with the submission.

Referencing

Reference numbers within the text should be superscripted and placed after punctuation.

The list of references at the end of the paper should be numbered consecutively in the order in which they are first mentioned and be consistent with the National Library of Medicine's International Committee of Medical Journal Editors' *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*.

eg. Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. *N Engl J Med*. 2002 Jul 25;347(4):284-7.

A full guide is available at www.nlm.nih.gov/bsd/uniform_requirements.html

The Editorial Board will make the final decision on publication of articles and may request clarifications or additional information.

Manuscripts should be emailed to:

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