ASSC Australian Skin and Skin Cancer Research Centre

MELANOMA SCREENING SUMMIT

MEETING REPORT

The University Of Queensland AUSTRALIA

QIMR Berghofer Medical Research Institute

This is the meeting report compiled from the ASSC Melanoma Screening Summit 25-26 March, 2019.

The Summit was held at the Translational Research Institute, Brisbane, Australia

Host: Australian Skin and Skin Cancer Research Centre (ASSC), supported by The University of Queensland and QIMR Berghofer Medical Research Institute.

Organising Committee: Joanne Aitken, Peter Baade, Anne Cust, Adele Green, Monika Janda, Kiarash Khosrotehrani, Victoria Mar, Rachel Neale, H. Peter Soyer, David Whiteman, Melissa Kerr

Contributors: Monika Janda, Katie Lee, Rachel Neale.

PROGRAM

Monday 25 March, 2019		
10:30	Welcome	Professor Monika Janda The University of Queensland
Session I: Epidemiology		
10:40	Principles of screening and how it applies to melanoma	Professor David Whiteman QIMR Berghofer Medical Research Institute
10:55	Overdiagnosis of melanoma	Dr Katy Bell University of Sydney
11:10	Feasibility of population vs targeted screening	Professor Peter Baade Cancer Council Queensland
11:25	Health economics of melanoma detection, diagnosis & treatment	Associate Professor Louisa Gordon QIMR Berghofer Medical Research Institute
Session II: National & international perspectives: Screening programs and trials		
11:40	Melanoma screening trials in Australia	Professor Joanne Aitken Cancer Council Queensland
11:55	10 years of skin cancer screening in Germany: difficulties and open questions	Professor Alexander Katalinic University of Lübeck, Germany
12:10	Clinical perspective: Acceptable absolutes and what to do about all the keratinocyte cancers	Professor Scott Menzies University of Sydney
12:30	Lunch	
Session III: Current and future landscape: Methodology of screening and early detection		
1:30	The role of whole body imaging & the opportunity for screening	Professor H. Peter Soyer The University of Queensland
1:45	Impacts of AI and new technology for detection	Professor Susan Swetter Stanford University, USA
2:00	Is pathology the gold standard for melanoma diagnosis?	Professor Richard Scolyer Melanoma Institute Australia
2:20	A population-based screening program versus opportunistic screening and early detection	Professor Sancy Leachman Oregon Health & Science University, USA
2:35	National requirements for the government to consider a screening program	Dr Jeanette Young Queensland Government
2:55	Afternoon tea	
Session IV: Panel discussion – Opportunities and challenges		
3:20	What is the road map for melanoma screening in Australia?	Facilitator: Professor Karen Canfell Cancer Council Australia
4:30	Wrap-up of Melanoma Screening Summit	Associate Professor Rachel Neale Associate Professor Anne Cust
Session V: Closed session (Day 2 – invitation only)		
8:30 – 12:30	Policy forum By invitation only	Facilitator: Karen Canfell

Presentations: http://www.assc.org.au/news-and-events/events-archive/melanoma-screening-summit-presentations/

INTRODUCTION

A skin cancer screening summit was held in Brisbane (25-26 March, 2019) organised by a national committee. The chair of the committee, **Professor Monika Janda,** welcomed the audience and explained the aims of the summit were to review the evidence regarding screening programs and their effectiveness, and to develop a roadmap for reducing melanoma mortality in Australia through evaluation of new opportunities in early detection. The summit was convened by the Australian Skin and Skin Cancer Research Centre (www.assc.org.au) and brought together more than 100 representatives from cancer control agencies, specialist medical colleges, government departments, research institutions, policy makers and consumers. Day 1 of the summit comprised a series of invited talks, and Day 2 was a closed forum attended by representatives of key organisations. All presentations from day 1 can be found on the ASSC website, and a brief summary of day 1 is provided below.

SESSION I: EPIDEMIOLOGY

Prof David Whiteman: Principles of screening and how it applies to melanoma

- Currently, melanoma screening does not meet all of the World Health Organisation criteria for a population screening program.
- Melanoma screening similar to other screening programs will result in over-diagnosis; that is, the diagnosis of tumours that are slow-growing and non-progressive and would not have harmed the patient had they remained undetected. The size of this problem is unknown.
- Data from the melanoma screening trial show that the positive and negative predictive values of whole body skin examination are low when applied to the general population due to the low prevalence of melanoma.
- Melanoma risk prediction tools make targeted screening theoretically feasible, but the mortality gains from this approach are currently unknown.
- There is debate about whether the most appropriate screening test is whole-body skin examination or a technological solution.

Dr Katy Bell: Overdiagnosis of melanoma

- In Australia there has been a marked increase in the incidence of melanoma. From 1982 to 2015 the incidence rose from 27 to 52 cases per 100,000. The increase in mortality was much lower (3.0 to 4.5 deaths per 100,000) suggesting that a proportion of the increase in incidence may be due to over-diagnosis.
- Harms of over-diagnosis include psychological stress, and the risks and costs (both individually and to the health system) of tests, treatment and ongoing surveillance.
- Dr Bell and colleagues used an innovative approach to estimate the extent of melanoma over-diagnosis in Australia. If only invasive melanomas are included and 1982 rates are compared to 2012 rates, approximately 15% of invasive melanomas in women and 22% in men may have been over-diagnosed.
- Over-diagnosis is unavoidable in cancer screening, and needs to be considered alongside the benefits of identifying potentially harmful melanomas at an earlier stage.

Professor Peter Baade: Feasibility of population vs targeted screening

- A randomised-controlled trial (RCT) with the outcome of mortality in the general population would likely not be feasible as the number of people needed to screen would be very large.
- An alternative outcome is melanoma thickness, but even using this outcome, a trial at a whole population level would require a large sample size. If the study were restricted to men aged 50 years and over, the sample size would be approximately 41,000 in each group.
- Using the above statistics, approximately 2,400 men 50 years and over would need to be screened to avoid one death from melanoma.
- Restricting the trial to people at high risk of melanoma would reduce the required sample size and the number needed to screen. However, such a design relies on the validity of the tool used to predict risk. One option is the QSkin risk prediction tool, but this has limitations, and cannot be used to predict risk of thick melanomas.
- Rather than initially screening for trial entry, an alternative design would be to use an adaptive enrichment method, when after a period of recruitment, interim analysis decides whether the test is effective for all people or only a subgroup of higher-risk participants, and recruitment of participants at higher risk then continues accordingly.

Associate Professor Louisa Gordon: Health economics of melanoma detection, diagnosis & treatment

- The health system burden of UV damaged skin is estimated at over $1 billion/year, including treatment of early and advanced melanoma, SCCs, BCCs, other skin malignancies and non-malignant manifestations of UV damage.
- The rate of skin excisions has increased by 63% over the past decade.
- Recent studies of the cost-effectiveness of screening or surveillance have had very variable results and are difficult to compare due to variable populations and methods. Screening also comes with opportunity costs: investment in early detection competes with primary prevention or treatment development, which have the same goal of reducing melanoma deaths.

Session II: National and international perspectives: Screening programs and trials

Professor Joanne Aitken: Melanoma screening trials in Australia

- Early detection programs aim to detect melanoma at the pre-invasive or early invasive stage, before symptoms develop.
- A pilot randomised control trial (which did not progress to a full trial) and a case-control study both suggest that screening programs reduce the incidence of thick melanomas and increase the incidence of thin melanomas.
- In the case-control study, people who had been screened within 3 years of their diagnosis were 38% more likely to have a thin (≤0.75mm) melanoma and 40% less likely to have a thick (≥3mm) melanoma.
- Whether these reductions in thick melanoma and increases in thin melanoma detection by screening are cost effective remains to be seen.

Professor Alexander Katalinic: 10 years of skin cancer screening in Germany: difficulties and open questions

- People over 35 years old were offered screening when they attended their doctor; screening interval was 2 years and the screening involved a 10-minute whole-body examination.
- Doctors underwent mandatory training in screening, and 70% of GPs and 93% of dermatologists participated.
- Screening resulted in increase in melanoma incidence, especially in situ and stage 1.
- So far, no clear increase or decrease in has been mortality observed.
- Participation was low (<40% of the population per screening round), possibly due to the lack of invitations to be screened and lack of awareness campaigns.
- There was insufficient quality assurance and evaluation, and the one-time education for GPs might have been insufficient.

Professor Scott Menzies: Clinical perspective: Acceptable absolutes and what to do about all the keratinocyte cancers

- False negative screening examinations are defined as those where a melanoma was detected post-screening.
- The number of false negative screenings depends on the sensitivity of screening, growth rates of melanomas, and the incidence of interval tumours.
- Screening may be more beneficial if targeting high-risk people and by using technology that improves sensitivity such as sequential digital dermoscopy monitoring.
- Potential harms of screening include higher false positive rates, overdiagnosis and overtreatment, and negative psychosocial consequences.
- Some subtypes of melanoma such as nodular ones are difficult to detect while still thin with visual inspection alone.
- Another side effect of melanoma screening is an increase in keratinocyte cancer detection. This is not necessarily a problem, since KCs often need to be treated anyway: amelanotic melanomas often mimic BCC, and SCC has low mortality but can evolve rapidly.

Session III: Current and future landscape: Methodology of screening and early detection

Professor H. Peter Soyer: The role of whole body imaging & the opportunity for screening Dermoscopy

- Patients with many lesions present the biggest clinical challenge
- Whole body imaging using either 2D or 3D imaging systems may allow clinicians to better track and compared lesions over time.
- The Australian Centre of Excellence in Melanoma Imaging and Diagnosis will combine a network 3D imaging systems in regional cities throughout eastern Australia with teledermatology.
- This will result in a large skin imaging database for data mining and in the future may allow in combination with genetic data and other risk factors for melanoma to improve risk stratification and the selection of high-risk patients who would benefit from regular screening.

Professor Susan Swetter: Impacts of AI and new technology for detection

- Multilayer neural network artificial intelligence systems can now achieve a level of pattern recognition far beyond human abilities.
- At least eight recent publications have reported convolutional neural networks that performed as well as board-certified dermatologists.
- However, these studies did artificially handicap dermatologists by not allowing them to use the usual full clinical information.
- Further studies needed to assess how these types of systems work with more complex diagnosis options, on various skin types, and in prospective studies, and also to determine how best to use AI to enhance clinical decision making.

Professor Richard Scolyer: Is pathology the gold standard for melanoma diagnosis?

- The ultimate gold standard is the clinical behaviour of a lesion, but waiting to see the outcome is not a practical approach, so pathology remains the de facto gold standard.
- Most pathological diagnoses are straightforward and correct; only a small subset of lesions that are borderline on histopathological examination and difficult to diagnose.
- Clinical history, areas of particular concern within the lesion, and providing images such as ex vivo dermoscopy of the excision can aid the pathologist.
- Molecular testing can also provide extra information.

Professor Sancy Leachman: A population-based screening program versus opportunistic screening and early detection

- Oregon study will roll out a population based early detection program, using a repeated measures design and comparison with other USA states.
- Approach will be stratified depending on people's risk levels.
- The general population will be offered a mobile app.
- Moderate risk population, with pigmentary and photodamage risk factors, will be offered e-consults and in-person clinics.
- High risk population, with personal melanoma history or atypical moles, will be offered teledermatology or in-person visits, dermoscopy and biopsies.
- Ultra-high risk population, with genetic predisposition, will be offered specialty clinics and advanced skin imaging.

Dr Jeanette Young: National requirements for the government to consider a screening program

- The Standing Committee on Screening (SCoS) advises on emerging screening issues, provides oversight for policy development, implementation and evaluation, expert technical advice on new evidence, and liaises with screening experts.
- Current population-based cancer screening programs in Australia are the National BreastScreen Program, National Cervical Screening Program, and National Bowel Cancer Screening Program.
- To be considered, a screening program must have a test meeting stringent requirements, have a clear referral system for management and follow-up, be cost effective, and have benefits that outweigh potential harms overall.
- SCoS does not currently recommend population screening for melanoma as current diagnostic practices are not optimal in terms of accuracy or cost-effectiveness.
- Instead, Australian Clinical Practice Guidelines recommend a risk-stratified approach of ongoing surveillance of high-risk individuals; these guidelines are being updated with genetic considerations and risk assessment methods.

- Further work remains to refine the risk-based screening approach, such as defining appropriate surveillance intervals and the best process for surveillance.

A/Prof Anne Cust and A/Prof Rachel Neale provided a summary of the presentations for the audience, highlighting key points raised by each presenter and the audience.

Session IV: Panel discussion: Opportunities and challenges – facilitated by Prof Karen Canfell

A panel of experts comprising **Dr Jeanette Young, Professor Susan Swetter, Professor Adele Green, Professor Jon Emery, and Mr Jay Allen** discussed a range of issues around implementing a roadmap to a screening program. This concluded day one of proceedings.