BMJ Open

Protocol for a within-trial economic evaluation of a psychoeducational intervention tailored to people at high risk of developing a second or subsequent melanoma

M Dieng,[1] A E Cust,[1,2] N A Kasparian,[3] P Butow,[4] D S J Costa,[4,5] S W Menzies,[6,7] G J Mann,[2,8] R L Morton[9]

CrossMark

For numbered affiliations see end of article.

Correspondence to
Mbathio Dieng; mbathio.dieng@sydney.edu.au

ABSTRACT

Introduction: Psychological support programmes are not currently funded for people with a history of melanoma. A major barrier to the implementation of effective psychological interventions in routine clinical care is a lack of cost-effectiveness data. This paper describes the planned economic evaluation alongside a randomised controlled trial of a psychoeducational intervention for people with a history of melanoma who are at high risk of developing new primary disease.

Method and analysis: The economic evaluation is a within-trial analysis to evaluate the incremental costs and health outcomes of a psychoeducational intervention compared to usual care from the perspective of the Australian healthcare system. Cost-effectiveness and cost-utility analyses will be conducted, providing estimates of the cost to reduce fear of melanoma recurrence and the cost per quality-adjusted life-year (QALY) gained. Fear of melanoma recurrence will be measured using the Fear of Cancer Recurrence Inventory and preference-based quality of life measured using the Assessment of Quality of Life—8 Dimensions (AQoL-8D) instrument. The AQoL-8D will provide utilities for estimation of QALYs in the cost-utility analysis. Unit costs of health services and medicines will be taken from the Medicare Benefits Schedule and the Pharmaceutical Benefits Scheme national databases. Health outcomes, and health service and medication use will be collected at baseline, 6 and 12 months follow-up. The within-trial analysis will be conducted at 12 months, consistent with the end point of the trial.

Ethics and dissemination: Approval to conduct the study was granted by the Sydney Local Health District (RPAH zone) Ethics Review Committee (X13-0065 and HREC/13/RPAH/86), the Department of Health and Ageing Human Research Ethics Committee (21/2013), the University of Sydney Human Research Ethics Committee (2013/595), and the Australian Institute of Health and Welfare Ethics Committee (EO 2013/4/58).

Trial registration number: ACTRN12613000304730; Pre-results.

Strengths and limitations of this study

- We have performed a number of preliminary studies, including (1) a systematic review of the literature on economic evaluations of psychological interventions to inform cost drivers and (2) a pilot study of the intervention in three melanoma clinics to determine the feasibility and acceptability of self-reported health service use and cost-related data collection.
- The protocol follows recognised guidelines to design and report economic evaluations nested in a randomised controlled trial and will include individual level data, which include objective measures of health service and medicine use, obtained by linkage to national data collections, overcoming the limitations of self-report.
- In Australia, there is not an explicit willingness to pay threshold for reduction of fear of cancer recurrence in people with cancer, or an explicit willingness to pay threshold for a quality-adjusted life-year gained.
- The Fear of Cancer Recurrence Inventory clinical cut-off point has been validated in those with other cancers but not in people at high risk of developing second or subsequent melanomas.
- A further potential limitation is the short duration of the trial, with cost-effectiveness being calculated at 12 months.

INTRODUCTION

Research supports the value of psychological interventions to enhance psychological adjustment, mental health and quality of life of people with melanoma.[1] In addition, guidelines recommend that psychological and psychoeducational interventions be offered as part of routine clinical care for people with melanoma.[2] Currently, however, there are no funded psychological support programmes for melanoma survivors during

their post-treatment follow-up. A major barrier to the implementation of these interventions in routine clinical care is a lack of data on their cost-effectiveness. In a recently published systematic review, we identified only eight economic evaluations of psychological interventions in cancer, and only one (a retrospective cost-effectiveness analysis (CEA)) was carried out in the melanoma context.[3]

Given the increasingly limited funding for healthcare resources, it is vital that psychological interventions be assessed for their impact on health outcomes and value for money. To facilitate decision-making, it is important to consider whether implementing an intervention is worthwhile given the incremental costs and incremental benefits that may be generated. The additional cost per health outcome considered 'worthwhile' is based on willingness to pay thresholds as well as other key criteria, usually defined by government decision makers. An intervention that is cost-effective has an incremental cost-effectiveness ratio (ICER) lower than the funders' willingness to pay threshold.[4] An alternative approach to using the ICER is the net benefit approach, where a cost-effective intervention is the one with the highest net benefit.[4 5]

Recommended best practice for economic evaluations of healthcare interventions is that they are conducted prospectively alongside a randomised controlled trial (RCT).[6] We are conducting a RCT of a psychoeducational intervention for people with a history of melanoma who are at high risk of developing new primary disease (ie, a second or subsequent melanoma). To heighten the transparency of our methods and results and to enable a detailed description to be provided, we describe in this paper the protocol for a within-trial economic evaluation of the psychoeducational intervention based on 12-month follow-up data. The economic question to be addressed is whether the psychoeducational intervention is cost-effective from a health system perspective, compared to usual care, in reducing the proportion of participants who report fear of melanoma recurrence at a level warranting clinical intervention, and cost-effective in terms of quality-adjusted survival.

METHODS AND ANALYSIS
Design
Full details of the RCT protocol have been published.[7] In brief, the Melanoma Care Intervention Study was a two-arm RCT designed for people with a history of melanoma who are at high risk of developing new primary disease and who were attending one of three high-risk melanoma clinics across New South Wales (NSW), Australia. People attending the clinics have had a melanoma and carry an additional risk factor, either multiple primary invasive melanomas, dysplastic nevus syndrome (ie, many atypical moles) or a strong family history; alternatively they could carry a high-penetrance mutation in

CDKN2A or CDK4 (with or without a melanoma diagnosis). Recruitment for the trial was conducted between February 2014 and January 2015 at the Sydney Melanoma Diagnostic Centre, the Melanoma Institute Australia (both in metropolitan Sydney) and the Newcastle Skin Check Clinic, located in a regional, coastal area. Randomisation was performed, ensuring allocation concealment, using the telephone randomisation service at the Australian National Health and Medical Research Council (NHMRC) Clinical Trials Centre, The University of Sydney. Recruited participants were assigned an identification code and randomised using minimisation, stratified by high-risk clinic site.

The economic evaluation is a within-trial analysis to evaluate the additional costs and health outcomes of the psychoeducational intervention compared to usual care from the perspective of the Australian healthcare system. Economic evaluations are comparative analyses of alternative interventions in regards to costs, resource use and health outcomes.[8] This protocol outlines the methods for an economic evaluation of a CEA and cost-utility analysis (CUA) to evaluate the cost per health outcome gained. The difference between the two analyses is the measure of effectiveness used. With CEA, costs are expressed in monetary units (eg, dollars) and effects in clinical outcome units (eg, additional people in whom the fear of melanoma recurrence—at a level warranting clinical intervention—is averted), while for CUA, costs are expressed in monetary units and effects in quality-adjusted life-years (QALYs) gained. The health system perspective considers costs and outcomes relevant to the Australian healthcare system. This was informed by a recent systematic review of economic evaluations of psychological and psychoeducational interventions in cancer, which reported that the main drivers of costs were direct medical costs.[3]

Study population
All trial participants will be included in the economic evaluation. Participants attending the high-risk melanoma clinics were eligible for the RCT if previously diagnosed with American Joint Committee on Cancer (AJCC)[9] melanoma stage 0, I or II, were aged 18 years or older and with sufficient English language skills to complete all aspects of the study without the assistance of an interpreter. All participants gave informed consent to take part in the RCT, including consent to access their records from the national Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) databases.

Intervention and comparator
The intervention was designed to address the gap in psychological support for people affected by melanoma. The intervention was comprised of an evidence-based psychoeducational booklet, 'Melanoma: Questions and Answers', and three individually tailored, telephone-based psychotherapeutic sessions with a psychologist.

The control group received usual care and were provided with the cancer council booklet 'Understanding Melanoma'. A summary of the intervention and comparator components is presented in table 1.

Outcome measures

Table 2 summarises the outcome measures and time of collection for the outcomes that will be used in the economic evaluation. Outcome data were collected using self-reported questionnaires by the trial participants at baseline (before randomisation), 6-month and 12-month follow-up.

Two economic outcomes will be calculated. First, the primary outcome of effectiveness for the CEA will be the proportion of participants who do not report fear of melanoma recurrence warranting clinical intervention, in the past month. Fear of new or recurrent melanoma was assessed using the Severity subscale of a modified (ie, melanoma-specific) version of the 42-item Fear of Cancer Recurrence Inventory (FCRI).[10] The FCRI was categorised into two levels: FCRI Severity scores within the 'normal' range (scores ranging from 1 to 12) and FCRI Severity scores indicating a potential need for clinical intervention (scores ranging from 13 to 36).[11] A higher score is indicative of greater fear of cancer recurrence.

Second, for the CUA, the Assessment of Quality of Life—8 Dimensions (AQoL-8D) will be used to measure health-related quality of life and provides utilities for estimation of QALYs.[12 13] The AQoL-8D is a preference-based measure, designed to record health-related quality of life in a format amenable to economic evaluation. It is specifically developed for interventions that aim to improve mental health, with norms for the Australian population by age and gender. It is sensitive to change after psychological interventions because it includes domains such as depression/anxiety, social function and self-esteem. The AQoL-8D is a 35-item health-related quality of life preference-based measure from which eight dimensions and two 'superdimensions' are derived.[12] The total 35-item score will be converted to a single utility score using the AQoL-8D algorithm.[13]

Resource use and costs

For the within-trial analysis, only costs and effects that accumulate within the trial up to 12 months will be included. Costs will be identified and valued as all melanoma-related direct costs, hospital visits, hospital admissions, doctor visits, allied health services use (eg, psychologist, genetic counsellor, dietician) and intervention costs. Table 3 presents an overview of the resource use and cost measures to be used in the economic evaluation; this includes costs hypothesised to differ between intervention and control groups, costs associated with intervention development and delivery, health services and medication costs.

Costs associated with intervention development will include development and pilot testing of the psychoeducational booklet, 'Melanoma: Questions and Answers', as well as development of the intervention manual, psychologist recruitment and training, and pilot testing of the intervention. Human resource records and intervention development team records will be used for the valuation of these costs.

The trial-associated costs will take into account the salaries and administrative costs associated with coordinating the trial, production of the trial materials, postage, psychologist salaries, weekly clinical supervision costs, the recording material and telephone use (number and duration of calls). We will not include the cost of the routinely issued Cancer Council booklet, 'Understanding Melanoma', because this is being offered to both groups; hence, the cost is identical in both groups. Research team and psychologists' records relating to intervention delivery and the human resources records will be used to value the costs.

All resource use related to the psychoeducational intervention, including the use of mental health services and any direct costs related to melanoma diagnosis, treatment or risk management, including medicines, will be quantified. Unit costs for health services and medication use will be estimated from linkage to the national Medicare (MBS) and Pharmaceutical (PBS) databases. Other service use not recorded in MBS or PBS (eg, hospital admission, private psychology services, use of complementary therapies) will be based on participant self-report, collected at baseline, 6-month and 12-month follow-up. Participants' total health service use cost will be the aggregation from the number of services used by the unit cost for the service.

All resources will be valued in 2014 Australian dollars. No discounting will be applied as follow-up is over 1 year only. The cost of the booklet development in 2013 will be inflated to the current reference year.

Statistical analysis

Analyses of the main study outcomes will be carried out according to intention to treat.[6] For the economic evaluation, all statistical tests and CIs will be two sided, with statistical significance inferred at the 0.05 level. Potential differences in costs and health outcomes between the two groups and the 95% CIs will be presented. Since costs and QALYs are usually non-normally distributed,[14] we will use generalised linear models[15] for adjustment of baseline covariates. The effect of the intervention will be estimated using a linear mixed model with random intercept, including time as a repeated categorical variable and adjusting for baseline scores (ie, baseline outcome scores will be included as covariates in the model). Baseline covariates will include age, gender, family income, education level and marital status. CIs for the ICERs will be calculated using a non-parametric bootstrap procedure. Statistical analysis will be performed using SAS V.9.3 (SAS Institute, Cary, North Carolina, USA) and Excel (Microsoft Corp., Redmond, Washington, USA).

Table 1 Summary of the intervention and comparator components

Component	Description	Intervention	Usual care
Full dermatological appointment at the high-risk clinic	Full dermatological appointments at the high-risk clinics designed to screen patients using different techniques, including dermoscopy, digital dermoscopy monitoring and total body photography	Every 6 months	Every 6 months
Psychoeducational booklet, 'Melanoma: Questions and Answers'	A 76-page, full-colour, evidence-based, psychoeducational booklet comprised of seven modules and a series of tailored resources. The booklet features comprehensive information on a range of topics, including melanoma types and risk factors, clinical care for people affected by melanoma, tools for skin self-examination and doctor–patient communication, psychological aspects associated with melanoma, including living with fear of new or recurrent melanoma, coping responses, tools for keeping track of one's care, and pathways to further information and support	Four weeks prior to 6-monthly full dermatological appointment	At the end of the trial
Cancer Council booklet, 'Understanding Melanoma'	Easy-to-read information about melanoma diagnosis, treatment, and emotional and practical issues. The booklet was sent to participants 4 weeks prior to their next full dermatological appointment	Four weeks prior to 6-monthly full dermatological appointment	Four weeks prior to 6-monthly full dermatological appointment
Psychotherapeutic Session 1	Scheduled 1 week prior to patients' 6-monthly full dermatological appointment. Session 1 featured a psychological assessment, including discussion of participants' background, experiences of melanoma and clinical care, other health-related experiences, information and support needs, and goals, hopes and wishes for the intervention	One week prior to 6-monthly full dermatological appointment	Never
Psychotherapeutic Session 2	Session 2 included exploration of participants' experience of his or her recent high-risk melanoma clinic appointment and its outcomes, the clinical care received, review of previous session and any difficulties experienced, participants' unmet information and support needs, and information and referral for addressing unmet needs, when appropriate	One week after 6-monthly full dermatological appointment	Never
Psychotherapeutic Session 3	Session 3 comprised: review of previous session and any difficulties experienced since the session, discussion of the degree to which unmet needs have been addressed, discussion of new strategies to address potential future difficulties or concerns, exploration of relevant services and resources in the booklet and other sources and facilitation of referral for ongoing psychological care, if indicated	Three weeks after 6-monthly full dermatological appointment	Never

Table 2 Overview of health outcomes measured

Health outcome	Means of collection	Timing of collection	Source of data
Fear of cancer recurrence (severity score)	FCRI administered via self-report questionnaire	Baseline prior to randomisation 6-month follow-up 12-month follow-up	Patient-reported outcomes
Health-related quality of life	AQoL-8D administered via self-report questionnaire	Baseline prior to randomisation 6-month follow-up 12-month follow-up	Patient-reported outcomes

AQoL-8D, Assessment of Quality of Life—8 Dimensions; FCRI, Fear of Cancer Recurrence Inventory.

Table 3 Overview of resource use measures

Item of resource use	Unit	Unit costs	Source of data
Intervention			
Booklet development	Hour research time	AUD/hour	Grant budget
Pilot testing			
Booklet design	Hour Graphic design	AUD/hour	Designer invoice
Booklet printing	Booklet	AUD/booklet	Printing invoice
Questionnaire printing	Questionnaire	AUD/survey	Printing invoice
Postage	Reply paid envelope	AUD/envelope	Trial records
Intervention manual development	Therapist hour	AUD/hour	University HR
Psychologist recruitment	Advertisement	AUD/advert	APS invoice
Psychologist training	Hour of training	AUD/hour	University HR
Weekly clinical supervision	Hour of supervision	AUD/hour	Trial records
Trial-related costs			
Trial coordination	Hour PhD student	AUD/hour	University HR
	Hour RA	AUD/hour	University HR
Psychologist salary	Hour psychologist	AUD/hour	University HR
Booklets printing	Booklet	AUD/booklet	University HR
Questionnaires printing	Questionnaire	AUD/survey	Printing invoice
Telephone counselling	Minutes telephone call	AUD/min	Provider rates
Recording materials	Recorder	AUD/recorder	Trial records
Stamps	Set	AUD/set	Trial records
Envelopes	Box	AUD/box	Trial records
Health services use			
Doctors' visits	Mean number of hours of visit	85% scheduled fee in AUD	Medicare Australia
Diagnostic testing			
Psychologist visit			
Psychiatrist visit			
Social worker			
Counselling service			
Complementary therapies			
Other allied health			
Medication use			
Prescribed medications	Dose	PBS fee	Medicare Australia

APS, Australian Psychological Society; AUD, Australian dollar; HR, Human resources; PBS, Pharmaceutical Benefits Scheme; RA, research assistant.

Sample size

The sample size was based on the main study clinical end points, not the expected difference in cost-effectiveness. Sample size calculations were based on 80% power and a two-sided $\alpha=0.05$ test. Since there was not a validated, accepted estimate of the minimal clinically important difference for the Fear of Cancer Recurrence Inventory Severity subscale, we based the sample size calculation on a standardised mean difference (Cohen's d) of 0.5, which is a moderate effect size and is applicable to a wide variety of patient-reported outcomes.[16] Based on previous research (not yet published), the SD was estimated as 29; thus, the expected mean difference in the FCRI scale was 14.5. Using these values, and after taking into account the maximum expected attrition rate of 20%, the sample size required

was 77 per group. Sample sizes based on economic outcomes are usually large in order to detect statistically significant differences due to the large variability in the use of healthcare resources and cost measures.[17] It was therefore not feasible for our trial to be based on the economic end point because of the relatively limited number of patients attending the high-risk melanoma clinics. To overcome this limitation in the evaluation, we will plot a cost-effectiveness acceptability curve (CEAC). The CEAC is a graphical representation of the quantification of the uncertainty around the expected cost-effectiveness, at different willingness to pay levels.[5]

CEA and CUA
The economic evaluation will use patient-level data on resource use and effects within the clinical trial period to assess the cost-effectiveness of the psychoeducational intervention compared to the usual care. Total and average costs for the intervention and control groups and the average cost per participant will be reported in disaggregated and aggregated formats. Total and mean outcomes (fear of cancer recurrence severity and quality-adjusted survival) will be reported for the intervention and usual care groups. For fear of cancer recurrence severity and QALYs, we will adjust for baseline values.[18] ICER will be calculated and reported. Results of the CEA will be expressed as the incremental cost per additional person without a FCRI Severity subscale score above the clinical cut-off (13). Results of the CUA will be expressed as the incremental cost per QALY gained in the intervention group compared with the usual care group.[4] Results will be plotted on a cost-effectiveness plane.

The cost per person without a fear of melanoma recurrence at a level warranting clinical intervention will allow us to compare the cost-effectiveness results with other similar psychoeducational interventions in melanoma. The cost per QALY will be useful for comparison of cost-effectiveness with other cancers and diseases because QALYs are not disease specific.[17] Reporting of the study design, methods and results will follow the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement.[19]

Missing data
Mean imputation will be used to handle missing baseline values. Multiple imputation approaches will be used to handle missing outcomes data (eg, FCRI Severity scores). For AQoL-8D scores, we will follow the developer's guideline for missing data; that is, missing data will be handled by imputing values within each dimension. If more item responses in the dimensions are missing, the observations will be dropped and there will not be a dimension score or instrument score for the individual.[12] To address potential biases due to incomplete follow-up, we will use multiple imputation approaches to replace cost values that are missing at random or missing completely at random.[14 20 21] Since cost data are unlikely to be normally distributed,[14] we will use the

multiple imputation chained equations approach to impute missing cost data. Costs will be imputed at the total cost level.[14]

Sensitivity analysis
Bootstrapping will be used to estimate a distribution around costs and health outcomes, and to estimate the CIs around the ICER. Several one-way sensitivity analyses will be carried out. First, to address the uncertainty around the ICER relating to the external validity, we will carry out sensitivity analyses on the most important cost drivers to assess the impact of protocol-driven healthcare use. Second, total cost will be calculated with and without the cost of intervention development to ascertain whether an increased cost in the intervention arm could be explained by the cost of the intervention. Third, regression analyses will be carried out to ascertain more efficient estimates of trial-wide treatment cost-effectiveness and allow the estimation of cost-effectiveness relating to subgroups based on patient characteristics.[22] We have collected several patient-level variables that will be used as covariates (eg, age, gender, education level, income level and previous clinical history) in a regression model. In addition, one-way sensitivity analyses will be conducted around the probability that the psychoeducational intervention is cost-effective across a range of values, and a CEAC[23] will be plotted.

Ethics approvals and trial registration
Approval to conduct the study was granted by the Sydney Local Health District (RPAH zone) Ethics Review Committee (13 March 2013; X13-0065 and HREC/13/RPAH/86), the Department of Health and Ageing Human Research Ethics Committee (12 August 2013), and the Australian Institute of Health and Welfare Ethics Committee (26 November 2013; EO 2013/4/58) for Medicare linkage. The trial was registered with the Australian and New Zealand Clinical Trials Registry on 19 March 2013 (Registration Number: ACTRN12613000304730). The RCT protocol has been endorsed by the Australia and New Zealand Melanoma Trials Group (ANZMTG) and by the Scientific Advisory Committee of the Psycho-oncology Co-operative Research Group (PoCoG).

DISCUSSION
To inform the implementation of interventions in clinical practice, guidelines recommend providing evidence of value for money;[6] however, there are a limited number of economic evaluations alongside clinical trials available in the psycho-oncology literature.[3 24] For transparency of reporting and to enable a detailed description of the economic evaluation methods to be provided, this paper presents the protocol of a within-trial economic evaluation aiming to assess the cost-effectiveness of a psychoeducational intervention developed for people with a history of melanoma at high risk

of developing new primary disease. This study will provide the first prospective, trial-based evidence on the healthcare costs associated with psychoeducational support for people with melanoma.

This study has several strengths. First, in preparation for the economic evaluation of the intervention, we have performed a number of preliminary studies, including (1) a systematic review of the literature on economic evaluations of psychological interventions to inform cost drivers and (2) a pilot study of the intervention in three melanoma clinics to determine the feasibility and acceptability of self-reported health service use and cost-related data. Second, this protocol follows recognised guidelines to design and report on economic evaluations nested in a RCT.[6] In addition, the economic evaluation will include individual-level data, which are preferable for economic evaluations.[6] Importantly, these individual-level data include objective measures of health service and medicine use, obtained by linkage to national data collections, overcoming the limitations of self-report.[25] Reliable economic evaluations are crucial to shape healthcare policy, in particular when the possibility of bias in economic evidence has been minimised by randomisation.[26] Economic evaluations of psychological and psychoeducational programmes are also necessary to inform decision makers and to promote the funding and implementation of these interventions in clinical care. A review of the literature found a scarcity of cost-effectiveness studies related to psychological interventions in cancer in general and in melanoma in particular.[3] The only previous study by Bares et al[27] was a retrospective economic evaluation of a psychological intervention to alleviate emotional distress in people with melanoma. The authors found an ICER of $402.37 for 1 point decrease of the Global Severity Index of the Brief Symptom Inventory scale for the usual care group, compared to an ICER of $7.66 for 1 point decrease for the intervention group (usual care+cognitive–behavioural therapy). However, the study lacked methodological rigour in that the perspective chosen was not stated, not all costs and outcomes were properly identified and valued, and a sensitivity analysis was not conducted.[3]

A limitation of the proposed evaluation is that in Australia, there is not an explicit willingness to pay threshold for reduction of fear of cancer recurrence in people with cancer, or an explicit willingness to pay threshold for cost per QALY gained. However, an observation of the decisions of the Pharmaceutical Benefits Advisory Committee between 1994 and 2003 points to an 'arbitrary' threshold of $A69 900 per QALY gained.[28] In addition, the FCRI clinical cut-off point has been validated in those with other cancers but not in people at high risk of developing second or subsequent melanomas. Furthermore, the use of a clinical cut-point of 13 or above on the severity subscale of the FCRI has been proposed as the point at which people should be referred for a psychological assessment and potentially treatment.[11] However, we would undertake a sensitivity

analysis for the main economic outcome if future published cut-points were to differ markedly. Common to all cost-effectiveness analyses conducted alongside clinical studies, restrictive inclusion criteria and protocol-driven resource use among other factors could influence the external validity of the results.[6] Therefore, we will conduct a range of sensitivity analyses around key variables (cost drivers, total cost calculated with and without the cost of the intervention development, patient characteristics) to address the uncertainty around the ICER relating to the external validity. A further potential limitation is the short duration of the trial, with cost-effectiveness being calculated at 12 months.

CONCLUSION

The publication and peer-review of economic evaluation protocols alongside clinical trials is recommended to increase transparency and minimise bias.[29] This study aims to contribute valuable evidence about the cost-effectiveness of a psychoeducational intervention for people with a history of melanoma at high risk of developing new primary disease. The results of this study will be of immediate relevance for decision makers regarding implementation of this novel psychoeducational intervention for this patient group. In addition, if cost-effectiveness is demonstrated, the multidisciplinary collaboration on this project, involving several melanoma clinics, psycho-oncology and melanoma trial groups and consumer groups, will facilitate future implementation.

Author affiliations
[1]Cancer Epidemiology and Prevention Research, Sydney School of Public Health, The University of Sydney, Sydney, New South Wales, Australia
[2]Melanoma Institute Australia, The University of Sydney, North Sydney, New South Wales, Australia
[3]Discipline of Paediatrics, School of Women's and Children's Health, UNSW Medicine, The University of New South Wales, Sydney, New South Wales, Australia
[4]Psycho-oncology Co-operative Research Group, School of Psychology, The University of Sydney, Sydney, New South Wales, Australia
[5]Pain Management Research Institute, University of Sydney at Royal North Shore Hospital, St Leonards, New South Wales, Australia
[6]Discipline of Dermatology, Sydney Medical School, The University of Sydney, Camperdown, New South Wales, Australia
[7]The Sydney Melanoma Diagnostic Centre, Royal Prince Alfred Hospital, Camperdown, New South Wales, Australia
[8]Centre for Cancer Research, Westmead Institute for Medical Research, The University of Sydney, Westmead, New South Wales, Australia
[9]NHMRC Clinical Trials Centre, The University of Sydney, Camperdown, New South Wales, Australia

REFERENCES

1. McLoone J, Menzies S, Meiser B, et al. Psycho-educational interventions for melanoma survivors: a systematic review. *Psychooncology* 2013;22:1444–56.
2. Australian Institute of Health and Welfare. *Clinical practice guidelines for the management of melanoma in Australia and New Zealand.* Wellington: Cancer Council Australia and Australian Cancer Network, Sydney and New Zealand Guidelines Group, 2008.
3. Dieng M, Cust AE, Kasparian NA, et al. Economic evaluations of psychosocial interventions in cancer: a systematic review. *Psychooncology* 2016. [Epub ahead of print 26 Jan 2016]. doi:10.1002/pon.4075.
4. Drummond MF SM, Torrance GW, O'Brien BJ, et al. *Methods for the economic evaluation of health care programmes.* 3rd edn. Oxford University Press, 2005.
5. Edlin R, McCabe C, Hulme C, et al. *Cost effectiveness modelling for health technology assessment: a practical course.* New York: Springer, 2015.
6. Ramsey S, Willke R, Briggs A, et al. Good research practices for cost-effectiveness analysis alongside clinical trials: the ISPOR RCT-CEA Task Force report. *Value Health* 2005;8:521–33.
7. Dieng M, Kasparian NA, Morton RL, et al. The Melanoma care study: protocol of a randomised controlled trial of a psycho-educational intervention for melanoma survivors at high risk of developing new primary disease. *BMC Psychol* 2015;3:23.
8. Hoch JS, Dewa CS. An introduction to economic evaluation: what's in a name? *Can J Psychiatry* 2005;50:159–66.
9. Balch CM, Gershenwald JE, Soong SJ, et al. Final version of 2009 AJCC melanoma staging and classification. *J Clin Oncol* 2009;27:6199–206.
10. Simard S, Savard J. Fear of Cancer Recurrence Inventory: development and initial validation of a multidimensional measure of fear of cancer recurrence. *Support Care Cancer* 2009;17:241–51.
11. Simard S, Savard J. Screening and comorbidity of clinical levels of fear of cancer recurrence. *J Cancer Surviv* 2015;9:481–91.
12. Richardson J, Iezzi A, Khan MA, et al. Validity and reliability of the Assessment of Quality of Life (AQoL)-8D multi-attribute utility instrument. *Patient* 2014;7:85–96.
13. Richardson J, Sinha K, Iezzi A, et al. Modelling utility weights for the Assessment of Quality of Life (AQoL)-8D. *Qual Life Res* 2014;23:2395–404.
14. Faria R, Gomes M, Epstein D, et al. A guide to handling missing data in cost-effectiveness analysis conducted within randomised controlled trials. *Pharmacoeconomics* 2014;32:1157–70.
15. Briggs A, Sculpher M, Karl C. *Decision modelling for health economic evaluation.* New York: Oxford University Press, 2006.
16. Norman GR, Sloan JA, Wyrwich KW. Interpretation of changes in health-related quality of life: the remarkable universality of half a standard deviation. *Med Care* 2003;41:582–92.
17. Petrou S, Gray A. Economic evaluation alongside randomised controlled trials: design, conduct, analysis, and reporting. *BMJ* 2011;342:d1548.
18. Manca A, Hawkins N, Sculpher MJ. Estimating mean QALYs in trial-based cost-effectiveness analysis: the importance of controlling for baseline utility. *Health Econ* 2005;14:487–96.
19. Husereau D, Drummond M, Petrou S, et al. Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement. *BMC Med* 2013;11:1–6.
20. Briggs A, Clark T, Wolstenholme J, et al. Missing…presumed at random: cost-analysis of incomplete data. *Health Econ* 2003;12:377–92.
21. Schafer JL. Multiple imputation: a primer. *Stat Methods Med Res* 1999;8:3–15.
22. Hoch JS, Briggs AH, Willan AR. Something old, something new, something borrowed, something blue: a framework for the marriage of health econometrics and cost-effectiveness analysis. *Health Econ* 2003;11:415–30.
23. Fenwick E, O'Brien BJ, Briggs A. Cost-effectiveness acceptability curves—facts, fallacies and frequently asked questions. *Health Econ* 2004;13:405–15.
24. O'Sullivan AK, Thompson D, Drummond MF. Collection of health-economic data alongside clinical trials: is there a future for piggyback evaluations? *Value Health* 2005;8:67–79.
25. Glick HA, Doshi JA, Sonnad SS, et al. *Economic evaluation in clinical trials.* 2nd edn. Oxford: Oxford University Press, 2015.
26. Gold MR, Siegel JE, Daniels N, et al. *Cost-effectiveness in health and medicine: report of the panel on cost-effectiveness in health and medicine.* New York: Oxford University Press, 1996:283–5.
27. Bares CB, Trask PC, Schwartz SM. An exercise in cost-effectiveness analysis: treating emotional distress in melanoma patients. *J Clin Psychol Med Settings* 2002;9:193–200.
28. Henry DA, Hill SR, Harris A. Drug prices and value for money: The Australian Pharmaceutical Benefits Scheme. *JAMA* 2005;294:2630–2.
29. Godlee F. Publishing study protocols: making them visible will improve registration, reporting and recruitment. *BMC News Views* 2001;2:4.