A1. Methods

This guideline for screening, assessment and treatment of problem gambling was developed according to NHMRC guidance (1). The major steps in the process are presented in Figure 1.

Figure 1. Guideline development process

1 This guideline does not include a formal analysis of cost effectiveness of recommended practice versus current/established practice.
How the guideline came about

The Problem Gambling Research and Treatment Centre (PGRTC) was established in 2007 and is a joint initiative of the Victorian Government, the University of Melbourne and Monash University. The PGRTC is funded by the Victorian government through the Department of Justice and managed through the Board of Management. The idea for this guideline was conceived by Professor Shane Thomas (who was also the Chair of the expert advisory panel), because the team at the PGRTC identified that health and welfare professionals lacked adequate evidence-based guidelines for screening, assessing and treating problem gambling.

The funding received by the Victorian government through the Department of Justice is infrastructure funding and is not associated with any particular research or training activity, therefore editorial independence was maintained throughout the guideline development process.

Multidisciplinary contribution to guideline development

The guideline development group (GDG)

Professor Thomas identified and invited key people within the PGRTC to be involved in the development process. The GDG was responsible for the development of this guideline and was comprised of members of the PGRTC. Dr Marie Misso, from the Australasian Cochrane Centre (ACC), was also invited to be a member of the GDG to provide methodological guidance throughout the process and to enable best practice in evidence synthesis and guideline development methods informed by the Cochrane Handbook and NHMRC guidance. GDG members were not employed by industry or clinical services, and were guided by their own professional and university code of ethics. The members of the GDG included:

- Mr Chris Anderson, Project Manager, Executive Officer PGRTC, Monash University
- Dr Nicki Dowling, Senior Research Fellow PGRTC, University of Melbourne
- Professor Alun Jackson, Director PGRTC, University of Melbourne
- Ms Stephanie Merkouris, Research Assistant PGRTC, Monash University
- Dr Marie Misso, Research Fellow, Australasian Cochrane Centre, Monash University
- Dr Harriet Radermacher, Project Manager, Research Fellow, Monash University
- Professor Shane Thomas, Director PGRTC, Monash University
Expert advisory panel

In accordance with NHMRC protocol, the GDG identified and invited relevant experts from a range of disciplinary backgrounds, consumers and an Indigenous representative to be members of the expert advisory panel. The expert advisory panel comprised 17 members:

**CHAIR**
Professor Shane Thomas, Psychometrician and ethics expert, Monash University

**CLINICIANS WITH SPECIALIST EXPERTISE**
- Associate Professor Malcolm Battersby, Psychiatry, Flinders University
- Dr Nicki Dowling, Clinical Psychology, University of Melbourne
- Professor Alun Jackson, Social Work, University of Melbourne
- Professor Leon Piterman, General Practice, Monash University
- Professor Jim Westphal, Psychiatry, University of Hawaii

**CLINICIANS WITH GENERAL EXPERTISE**
- Associate Professor Danielle Mazza, General Practice, Monash University

**CONSUMERS REPRESENTATIVES**
- Mr Wayne Seiler
- Ms Gabi Byrne

**HEALTH ECONOMIST**
- Ms Lara Donovan, previously Centre for Health Economics, Monash University

**INDIGENOUS REPRESENTATIVE**
- Mr Ashley Gordon, Indigenous Research and Gambling Consultant

**INDUSTRY**
- Ms Sonja Bauer, Responsible Gaming, Crown Melbourne
- Ms Nadine Grinblat, Australasian Gaming Council

**PUBLIC POLICY/GOVERNMENT**
- Mr Trevor Hunt, Victorian Department of Justice (up to October 2010)
- Ms Sue Hughes, Victorian Department of Justice (from November 2010)
- Ms Leeanne Head, Office for Problem Gambling, South Australia

**SPECIALISTS IN EVIDENCE REVIEW AND GUIDELINE DEVELOPMENT**
- Dr Marie Misso, Australasian Cochrane Centre, Monash University

All members of the GDG and expert advisory panel fully disclosed their affiliations and declared any conflicts of interest by signing a conflict of interest declaration and confidentiality form. Those who had a direct or financial interest in any aspect of the guideline declared their interest to the Chair and they did not take part in any vote or discussion concerning that matter. Some of the potential conflicts of interest that were considered included:

1. Having a commercial interest, or having been employed by an entity with a commercial interest in the treatment of people with a diagnosis of problem gambling
2. Having served as a consultant for any entity having a commercial interest in problem gambling screening, assessment or treatment
3. Whether they or any immediate family member had any ownership interests in any entity, the stock of which is not publicly traded, which has a commercial interest in problem gambling screening, assessment or treatment products
4. Whether they or any immediate family member had any ownership interests valued at $1500 or more in any entity that has a commercial interest in any problem gambling screening, assessment or treatment products or guidelines

5. Whether they were currently receiving or had received research funding from any entity that has a commercial interest in any problem gambling screening, assessment or treatment products or guidelines

6. Whether they or any immediate family member had been paid honoraria or received gifts of value or equal to or greater than $3,500 per year or $7,500 over a three year period from any entity having a commercial interest in problem gambling screening, assessment or treatment products or guidelines

7. Any other potential conflicts of interest in relation to the problem gambling screening, assessment and treatment guideline

**Identification of clinical questions**

The clinical questions on which this guideline is based were devised by the GDG in consultation with and based upon input from the expert advisory panel. We deliberately chose a broad range of questions, and anticipated that for many of the questions we may not find suitable evidence. However, it was important to pose the questions nevertheless as this would enable us to formally identify any gaps in the evidence base. For a list of the clinical questions see the respective sections in this report.

For the screening and assessment part of the guideline six clinical questions were developed and 22 clinical questions were developed for the treatment part. Detailed inclusion and exclusion criteria regarding the participants, interventions, comparisons and outcomes (PICO) were identified and entered into tables for each clinical question (see Appendix A2.6 and A3.5 for each PICO table).

**Identification and review of other relevant gambling guidelines**

A search was conducted to identify any existing evidence-based guidelines to answer the clinical questions. Key gambling e-resources known to the GDG were searched to identify other relevant guidelines.

Two existing guidelines were identified on the treatment of people with gambling problems:


There were no guidelines identified for screening and assessment.

In order to assess the quality and suitability of the existing guidelines for potential adaptation, four independent reviewers assessed these guidelines using the AGREE instrument (2).

The AGREE instrument contains 21 questions covering scope and purpose, stakeholder involvement, rigour of development, clarity and presentation, applicability and editorial independence. Items are scored on a 4-point Likert scale from strongly agree to strongly disagree. Scores from the independent reviewers are calculated into an overall quality percentage for each domain.

The domain scores for the two existing guidelines are presented in Table 1. The GDG determined that these two guidelines were not suitable for adaptation and commenced the evidence identification process according to the clinical questions.

**Table 1. AGREE review scores obtained for the two existing guidelines**

<table>
<thead>
<tr>
<th>Domain</th>
<th>British Medical Association</th>
<th>Korn and Shaffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain 1: Scope and purpose</td>
<td>16.7%</td>
<td>52.7%</td>
</tr>
<tr>
<td>Domain 2: Stakeholder involvement</td>
<td>8.33%</td>
<td>18.75%</td>
</tr>
<tr>
<td>Domain 3: Rigour of development</td>
<td>14.29%</td>
<td>25%</td>
</tr>
<tr>
<td>Domain 4: Clarity and presentation</td>
<td>45.83%</td>
<td>16.6%</td>
</tr>
<tr>
<td>Domain 5: Applicability</td>
<td>5.56%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Domain 6: Editorial independence</td>
<td>83.33%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>
Identification of evidence

Searched databases

The following electronic databases were used to identify relevant literature:

- CINAHL
- The Cochrane Library
  - Cochrane Database of Systematic Reviews (Cochrane Reviews)
  - Database of Abstracts of Reviews of Effects (Other Reviews)
  - Cochrane Central Register of Controlled Trials (Clinical Trials)
  - Cochrane Database of Methodology Reviews (Methods Reviews)
  - The Cochrane Methodology Register (Methods Studies)
  - Health Technology Assessment Database (Technology Assessments)
  - NHS Economic Evaluation Database (Economic Evaluations)
- EMBASE
- EBM Reviews (OVID)
- Medline
- Medline in-process and other non-indexed citations
- PsycInfo
- ProQuest (Pharmaceutical News Index, ProQuest Health and Medical Complete, ProQuest Research Library, ProQuest Science Journals, ProQuest Social Science Journals)

The following journals were hand-searched as they are not indexed in any of the included databases or the following years were not indexed: Gambling Research (2003 onwards), International Gambling Studies (2001-2003) and Journal of Gambling Issues (2000-2006).

Reference lists of relevant articles identified by the search strategy and relevant reviews/meta-analysis were also searched for identification of additional studies.

Key gambling e-resources known to the GDG were searched to identify other relevant systematic reviews.

Search strategy

A broad ranging systematic search was developed by the GDG. The search strategy was limited to peer-reviewed journal articles with an English abstract published from 1st January 1980 to 2nd February 2010.

For Medline, PsycInfo, all EBM Reviews & ProQuest:

1. exp Gambling
2. gambl$
3. betting
4. wager
5. gaming
6. 1 or 2 or 3 or 4 or 5
For EMBASE & CINAHL
1. gambling
2. betting
3. wager
4. gaming
5. 1 or 2 or 3 or 4

This search identified 13,022 citations. Upon removal of duplicate citations and clearly irrelevant articles (e.g. studies investigating mice), by a single reviewer, a total of 3139 articles remained.

Review of evidence

Inclusion of studies
A reviewer scanned the titles, abstract sections and keywords of every record retrieved by the search strategy according to the a priori selection criteria (see PICO tables, Appendix A2.6 and A3.5). Each article was attributed a label to indicate whether it was included or excluded; if excluded, the reason was specified (e.g. excluded due to design, irrelevant topic etc.). Full articles were retrieved for further assessment if the information given suggested that the study met the inclusion criteria. Two independent reviewers then conferred to make a decision regarding the final inclusion of retrieved articles against the criteria.

Studies that used previously collected data to develop new problem gambling screening/assessment methods (modeling) were excluded.

Of the 3139 articles, a total of 4 studies were identified to address screening and assessment; and 35 studies (reported in 38 articles) addressed treatment.

A list of excluded studies was compiled, which consisted of articles that were retrieved in full text and did not meet the inclusion criteria. Reasons for exclusion were also provided (see A2.5 and A3.4).

Classification and assessment of evidence
Studies identified for inclusion in the review and development of the guideline were initially classified according to the NHMRC levels of evidence (Table 2).
<table>
<thead>
<tr>
<th>Level</th>
<th>Intervention §</th>
<th>Diagnosis **</th>
<th>Prognosis</th>
<th>Screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>A systematic review of level II studies</td>
<td>A systematic review of level II studies</td>
<td>A systematic review of level II studies</td>
<td>A systematic review of level II studies</td>
</tr>
<tr>
<td>II</td>
<td>A randomised controlled trial</td>
<td>A study of test accuracy with: an independent, blinded comparison with a valid reference standard, §§ among consecutive patients with a defined clinical presentation ††</td>
<td>A prospective cohort study ‡‡</td>
<td>A randomised controlled trial</td>
</tr>
<tr>
<td>III-1</td>
<td>A pseudorandomised controlled trial (i.e. alternate allocation or some other method)</td>
<td>A study of test accuracy with: an independent, blinded comparison with a valid reference standard, §§ among non-consecutive patients with a defined clinical presentation ††</td>
<td>All or none §§</td>
<td>A pseudorandomised controlled trial (i.e. alternate allocation or some other method)</td>
</tr>
<tr>
<td>III-2</td>
<td>A comparative study with concurrent controls: • Non-randomised, experimental trial † • Cohort study • Case-control study • Interrupted time series with a control group</td>
<td>A comparison with reference standard that does not meet the criteria required for Level II and III-1 evidence</td>
<td>Analysis of prognostic factors amongst untreated control patients in a randomised controlled trial</td>
<td>A comparative study with concurrent controls: • Non-randomised, experimental trial • Cohort study • Case-control study</td>
</tr>
<tr>
<td>III-3</td>
<td>A comparative study without concurrent controls: • Historical control</td>
<td>Diagnostic case-control study ††</td>
<td>A retrospective cohort study</td>
<td>A comparative study without concurrent controls:</td>
</tr>
</tbody>
</table>
study
• Two or more single arm study
• Interrupted time series without a parallel control group

<table>
<thead>
<tr>
<th>LEVELS OF EVIDENCE FOR THE TREATMENT REVIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Due to the impact of internal validity on studies addressing interventions for treatment of problem gambling, only level I and II evidence has been considered in the treatment section of this guideline.</td>
</tr>
</tbody>
</table>

**Assessment of methodological quality**

The methodological quality of the included studies was assessed using a priori criteria (4). Individual quality items were investigated using a descriptive component approach. Any disagreement was resolved by discussion and mediation with a third party to reach a consensus. Each criterion was graded as met, unmet or unclear.

*Effectiveness of screening, assessment and treatment*

The GDG judged that the most rigorous study design to address questions relating to the effectiveness of screening and assessment methods (clinical questions 1a to 4b, see guideline) and treatment (clinical questions 1a to 22b, see guideline) is considered to be a randomised controlled trial that independently compares the screening method or the intervention with an appropriate control. Based on these criteria, the validity of the methodology of included articles was assessed against the following criteria to determine a level of risk of bias:

- conflicts of interest addressed
- specified a clearly focused question
- study design used is appropriate to answer the question
- specified appropriate inclusion/exclusion criteria
- specified method of randomisation
- specified allocation concealment
- specified patient blinding
- specified investigator and care provider blinding
- specified outcome assessor blinding
- addressed whether the groups were treated the same
- specified duration of follow-up
- outcomes measured in a standard, valid and reliable way
• outcomes assessed objectively and independently
• sufficiently powered study to detect any differences between the groups
• appropriate statistical analysis undertaken
• similarity of groups at baseline with regards to key prognostic variables addressed
• specified percentage of individuals recruited into each arm of the study and those that dropped out
• addressed whether all the subjects were analysed in the groups to which they were randomly allocated (i.e. intention to treat analysis)
• selective outcome reporting addressed
• appropriate outcomes measured

**Accuracy of screening and assessment**
The GDG judged that the most rigorous study design to address questions relating to the accuracy of screening (clinical questions 5a to 6b, see guideline) is a prospectively-designed longitudinal cohort study that independently compares the tool with an appropriate reference standard (criterion or comparison standard) in consecutively-selected patients from a relevant clinical population. Based on these criteria, the validity of the methodology of included articles was assessed against the following criteria to determine a level of risk of bias (4):

- specified inclusion/exclusion criteria
- explicit description of participants
- appropriate spectrum of consecutively-selected participants
- prospective selection of participants
- Problem gambling screening/assessment method is compared with an appropriate criterion/comparison standard
- Problem gambling screening/assessment method is compared with the criterion/comparison standard in all participants
- blinded assessment of problem gambling screening/assessment method and criterion/comparison standard results
- Problem gambling screening/assessment method and criterion/comparison standard undertaken prior to any interventions

An overall risk of bias was determined for each study according to the following (4):

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>All of the criteria have been fulfilled or where criteria have not been fulfilled it is very unlikely the conclusions of the study would be affected.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Some of the criteria have been fulfilled and those criteria that have not been fulfilled may affect the conclusions of the study.</td>
</tr>
<tr>
<td>High</td>
<td>Few or no criteria fulfilled or the conclusions of the study are likely or very likely to be affected.</td>
</tr>
<tr>
<td>Insufficient information</td>
<td>Not enough information provided on methodological quality to be able to determine risk of bias.</td>
</tr>
</tbody>
</table>
Data extraction

Data, according to a priori criteria, were extracted from the included studies using a specially developed data extraction form (4). Information was collected on general details (title, authors, reference/source, country, year of publication, setting), participants (age, sex, inclusion/exclusion criteria, withdrawals/losses to follow-up, subgroups), results (point estimates and measures of variability, frequency counts for dichotomous variables, number of participants, intention-to-treat analysis) and validity results. Other information relating to psychometric properties and administration of the screening or assessment tool was also documented. A second reviewer then performed double-data extraction on a subset (~20%) of studies to ensure accuracy of results. Missing data was obtained from the authors wherever possible. Any disagreement was resolved by discussion and mediation with a third party to reach a consensus.

Quality appraisal and data extraction tables can be found in the Appendices (A2.4 and A3.3).

How recommendations were formulated

Where evidence existed to answer the clinical questions, evidence-based recommendations were made, with the grade of the recommendations reflecting the volume, consistency, clinical impact, generalisability and applicability of the evidence (Table 3). A body of evidence assessment matrix was created for each recommendation (see Appendix A2.2 and A3.1). Where the evidence identified in the evidence review was insufficient to make a recommendation of grade C or better, clinical questions were addressed by either consensus-based recommendations, practice points or research recommendations, where appropriate. The expert advisory panel then further developed the recommendations to ensure that clinical, consumer, indigenous and culturally and linguistically diverse (CALD) group perspectives were reflected.

For the screening and for the assessment questions, where there was no or insufficient evidence to make an evidence-based recommendation, where appropriate a consensus-based recommendation was made. Consensus-based recommendations are non-evidence-based recommendations that were developed and approved by the multidisciplinary GDG and expert advisory panel, based on the expert opinion of that group. The GDG decided that no consensus-based recommendations would be made in the absence of sufficient evidence for the treatment questions. The GDG were concerned that consensus-based recommendations for treatment, if implemented, could pose a risk to the target population.

Where appropriate, recommendations for research and practice points were made for screening, assessment and treatment.

All recommendations were developed by the GDG and reviewed by the expert advisory panel.
Table 3. Body of evidence assessment matrix

<table>
<thead>
<tr>
<th>Component</th>
<th>A: Excellent</th>
<th>B: Good</th>
<th>C: Satisfactory</th>
<th>D: Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume of evidence</td>
<td>several level I or II studies with low risk of bias</td>
<td>one or two level II studies with low risk of bias or a SR/multiple level III studies with low risk of bias</td>
<td>level III studies with low risk of bias, or level I or II studies with moderate risk of bias</td>
<td>level IV studies, or level I to III studies with high risk of bias</td>
</tr>
<tr>
<td>Consistency</td>
<td>all studies consistent</td>
<td>consistent and inconsistency may be explained</td>
<td>inconsistency reflecting genuine uncertainty around clinical question</td>
<td>evidence is inconsistent</td>
</tr>
<tr>
<td>Clinical impact</td>
<td>very large</td>
<td>substantial</td>
<td>moderate</td>
<td>slight or restricted</td>
</tr>
<tr>
<td>Generalisability</td>
<td>population/s studied in body of evidence are the same as the target population for the guideline</td>
<td>population/s studied in the body of evidence are similar to the target population for the guideline</td>
<td>population/s studied in body of evidence different to target population for guideline but it is clinically sensible to apply this evidence to target population</td>
<td>population/s studied in body of evidence different to target population and hard to judge whether it is sensible to generalise to target population</td>
</tr>
<tr>
<td>Applicability</td>
<td>directly applicable to Australian healthcare context</td>
<td>applicable to Australian healthcare context with few caveats</td>
<td>probably applicable to Australian healthcare context with some caveats</td>
<td>not applicable to Australian healthcare context</td>
</tr>
</tbody>
</table>

Where there was no or insufficient evidence (i.e. grade D) to answer a clinical question no evidence-based recommendation was made. See Table 4 for the definition of ‘no’, ‘insufficient’ and ‘sufficient’ evidence used in this review.
Table 4. Definition of terms used in the draft evidence-based recommendations

<table>
<thead>
<tr>
<th>GLOSSARY OF TERMS USED IN FORMULATING EVIDENCE-BASED RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No evidence</td>
</tr>
<tr>
<td>No studies were identified.. This does not mean there was</td>
</tr>
<tr>
<td>no evidence available, just that it did not meet our</td>
</tr>
<tr>
<td>inclusion criteria.</td>
</tr>
<tr>
<td>Insufficient evidence</td>
</tr>
<tr>
<td>Only one study met the inclusion criteria, and this was not</td>
</tr>
<tr>
<td>of sufficient quality (and therefore not reliable evidence) to</td>
</tr>
<tr>
<td>make an evidence-based recommendation.</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>More than one study met the inclusion criteria, but the</td>
</tr>
<tr>
<td>studies were not comparable or the findings were</td>
</tr>
<tr>
<td>inconsistent, therefore it was not appropriate to</td>
</tr>
<tr>
<td>synthesise to make an evidence-based recommendation.</td>
</tr>
<tr>
<td>Sufficient evidence</td>
</tr>
<tr>
<td>More than one study met the inclusion criteria, and the</td>
</tr>
<tr>
<td>findings were comparable, consistent and of sufficient</td>
</tr>
<tr>
<td>quality to make an evidence-based recommendation.</td>
</tr>
</tbody>
</table>

The component grades (in Table 3, above) were then compiled and an overall grade was assigned to each recommendation. The overall grade reflects the strength of the recommendation in terms of trust or confidence practitioners can have in the recommendation when applied in a clinical situation (see Table 4).

Where there was insufficient or no evidence to make an evidence-based recommendation, a clinical consensus or research recommendation was made based on the clinical expertise of the multidisciplinary guideline development group. Where important issues arose from discussion of evidence-based or clinical consensus-based recommendations, and thus evidence was not sought, clinical practice points have been provided. They are essential tips on how to safely and effectively implement the recommendations. Clinical consensus-based recommendations, clinical practice points and research recommendations, which are not based on a body of evidence but rather clinical expertise, are therefore not suitable for grading according to NHMRC criteria. The description of the four categories of recommendations is outlined in Table 5.
Table 5. Categories of recommendations (1)

<table>
<thead>
<tr>
<th>Recommendation category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-based</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Body of evidence can be trusted to guide practice</td>
</tr>
<tr>
<td>B</td>
<td>Body of evidence can be trusted to guide practice in most situations</td>
</tr>
<tr>
<td>C</td>
<td>Body of evidence provides some support for recommendation(s) but care should be taken in its application</td>
</tr>
<tr>
<td>D</td>
<td>Body of evidence is weak and recommendation must be applied with caution</td>
</tr>
<tr>
<td>Consensus-based</td>
<td>Recommendation based on expert opinion as insufficient evidence available</td>
</tr>
<tr>
<td>Practice Point</td>
<td>Practical advice and information based on expert opinion</td>
</tr>
<tr>
<td>Research Recommendation</td>
<td>Recommendation for further research, often provided when there is a gap in the evidence</td>
</tr>
</tbody>
</table>

All evidence-based recommendations formulated from each evidence review were reviewed three times to ensure consensus among the GDG: 1) a first draft recommendation(s) was suggested by the evidence team; 2) a second draft was discussed and revised by the GDG; 3) the revised recommendation was discussed and revised by the expert advisory panel.

Proposed public consultation process (currently underway)

In accordance with the NHMRC Act 1992 (the Act), the GDG will prepare a draft of the guideline and submit it to the NHMRC Council. A notice will be published, in the format as described in the Act, which will: (1) contain a summary of the draft guideline; (2) state where copies of the draft guideline can be obtained; and (3) invite persons or bodies to make submissions relating to the draft in accordance with the procedures, and within the period, specified in the notice (30 days from the publication of the last notice). A wide range of external groups will be targeted by the expert advisory panel including: practicing clinicians, allied health and professional organisations, consumer groups, Commonwealth, State and Territory and Local Government, health authorities, industry groups and other specific subgroups (e.g. indigenous, CALD and low socioeconomic communities). Media releases, newspaper advertisements and announcements on various websites will be used to publicise the public consultation phase. A summary table of the submissions received, together with the justification as to why each submission comment was or was not included in the document will be provided to the NHMRC at the time of lodging the final draft. These submissions will be available on request by the NHMRC.
References