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Protocol Title

Post-anaesthetic discharge scoring criteria: A comprehensive systematic review

Reviewers

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Prof. Bridie Kent (BSc(Hons), PhD, RN)¹

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Completion Date: December 2010

Background

The time immediately following a general anaesthetic is a critical period for patient recovery, requiring intensive observation to enable early detection of complications from the surgical episode. Since its introduction in 1923, the Post Anaesthesia Care Unit (PACU) is the preferred location for the immediate recovery of the post-operative patient ¹. A patient’s length of stay in PACU is dependent upon a number of factors, including pre-operative health status, surgical procedure, type of anaesthetic administered and the stability of vital signs. It has been common practice for PACU discharge policies to stipulate a minimum length of stay and traditionally a patient’s readiness for discharge has relied on nursing assessment of normality and stability of physiological parameters.

A patient’s condition can deteriorate quickly and much work has been carried out to develop tools to assist the identification of deteriorating vital signs. These have been associated with a reduction in adverse events in ward-based patients ². Increasingly, particularly since the advent of day procedure surgical units, there has been a trend towards the use of similar objective scoring systems to aid decision-making and quantify patient readiness for discharge from PACU. Several different scoring systems have been developed and tested ³-⁶. A study by Riley et al. ⁷ highlighted the methodological problems in developing a valid measurement tool for post-anaesthetic discharge scoring. Currently there is no consensus regarding the variables that should be used and a particular need has been identified to
establish criteria to assess a patient’s “home readiness” given the increasing frequency of
day surgery procedures.\textsuperscript{1}

The impetus for this systematic review has been concern about anecdotal reports of a
growing number of patient safety issues relating to post-anaesthetic care at different
metropolitan hospitals.\textsuperscript{6} While reporting of adverse events is mandatory for all Australian
hospitals, the indicators of patient safety which are collated do not allow the incidence of
events relating to post-anaesthetic care to be determined. Substantial research attention is
now being paid to generating and synthesising findings in ways that are designed to have
immediate applicability to healthcare practitioners.\textsuperscript{9-11}

Nurses manage patients in the PACU and evaluate discharge suitability. The Association of
Anaesthetists of Great Britain and Ireland (cited in 12) have recommended discharge criteria
and the Australian and New Zealand College of Anaesthetists\textsuperscript{13} have recommendations for
post-anaesthetic care. However anaesthetists often delegate the responsibility for patient
discharge to the PACU nurse.\textsuperscript{14} Basing nursing practice on evidence is fundamental to
optimal and effective care.\textsuperscript{15} Even experienced nurses can face a dilemma about the right
time to transfer patients to general wards.\textsuperscript{14} Many and varied criteria are used to assess a
patient for discharge from PACU, however evaluation of the validity and reliability of these
criteria requires further work.\textsuperscript{16} To date a systematic review of the literature relating to safe
discharge for patients from PACU to either transfer to the ward or to discharge directly to the
home environment has not been conducted.

**Review question and objectives**

This review will systematically examine the evidence to answer the question:

- What are the essential components of an effective scoring system to assess patients,
  following anaesthesia and surgery, thereby enhancing patient safety through timely and
  appropriate discharge?

The key objectives to be addressed are:

1. To identify the most commonly used predetermined PACU discharge criteria, which
can be used, predominantly but not exclusively, by nurses to assess patient
readiness for discharge from PACU.
2. To investigate whether some variables have greater relevance than others in terms of determining readiness for discharge.

3. To develop, from the evidence synthesis, a draft of a discharge tool that can be later submitted for review by a panel of experts to establish content validity.

Inclusion criteria

Types of participants

The review will consider studies that include adult patients (over 18 years of age), male and female, who have received care in the PACU for any type of surgery, planned or unplanned.

Types of Interventions

The review will consider studies that evaluate variables suitable for assessment of patient readiness for discharge from the PACU. This will include studies evaluating both individual and grouped predetermined discharge criteria; for example, measure of vital signs (temperature, respiratory rate, heart rate, blood pressure) and/or return to pre-operative baseline, capillary oxygen saturation, assessing level of consciousness, blood loss, pain assessment, and existing tools for discharge.

Type of Outcomes

This review will consider studies that include variables for patient assessment, examples of which are the following outcome measures:

- stable vital signs and/or stable capillary oxygen saturation
- presence or absence of nausea and/or vomiting
- pain score
- medication administration (such as anti-emetics and analgesics)
- PACU time
- PACU discharge delay
- adverse events related to early discharge from PACU, e.g:
  - complications that may have been avoided (e.g. medical emergency team (MET) calls)
- unexpected admissions to intensive care, critical care or high dependency units
- readmission rates (to theatre or hospital)
- increased length of hospital stay

**Types of Studies**

This review will consider any randomised controlled trials (RCTs) and quasi-randomised controlled trials that compare sets of variables or discharge tools to identify patients who are ready to be discharged from PACU. In the absence of RCTs, other research designs such as nonrandomised controlled trials, before and after studies and descriptive studies will be considered for inclusion in a narrative summary to enable the identification of current best evidence for the essential components of an effective scoring system to assess patients following surgery and anaesthesia, which will enhance patient safety through timely and appropriate discharge.

**Search Strategy**

In the early 1970’s discharge scores were first introduced to determine discharge from the PACU environment. The review will therefore consider studies published in the English language between 1970 and 2010.

The search strategy aims to find both published and unpublished studies. An initial scoping phase will be undertaken to identify any relevant MeSH terms and keywords. During the development of the search strategy consideration will be given to the diverse terminology used and the spelling of keywords as this may influence identification of relevant trials. A three step search strategy will be utilised for each component of this review. An initial limited search of MEDLINE and CINAHL will be undertaken, followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe the articles. A second search using all identified keywords and index terms will then be undertaken across all included databases. Thirdly, the reference list of all identified reports and articles will be searched for additional studies.

The databases to be searched include:

- AMED
- BioMedCentral
The search will also be conducted in the Grey Literature including:

- Conference proceedings
- Directory of open access journals
- Dissertations international
- Google Scholar
- Networked digital library of theses

In addition broader strategies will include: hand searching of journals, contact with key individuals who have researched and written on any relevant aspects, and government health department websites. All of the identified materials will be assessed for relevance to the review and a full report retrieved where studies meet the inclusion criteria. Studies identified from the reference list searches will be assessed for relevance on the study title. Wherever possible, personal contact will be made with relevant individuals and organisations for recommendation of literature e.g. Australian College of Operating Room Nurses (ACORN), Australian and New Zealand College of Anaesthetists (ANZCA) and the Australian Commission on Safety and Quality in Healthcare.
Initial keywords to be used will be:

- Post-operati* OR post-surg*
- Post-operative care OR post-operative complication*
- Post-anaesth OR post-anesth*
- Nurs* assessment
- Surgical/ adverse effect*
- Adverse event*
- PACU
- Recovery
- Discharge scor*
- Criteria
- Length of stay

**Assessment of methodological quality**

Papers selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review. The two reviewers will use the standardised critical appraisal instruments from Joanna Briggs Institute JBI-MAStARI (Meta Analysis of Statistics Assessment and Review Instrument; Appendix I) for quantitative evidence. Any disagreements that arise between the two reviewers will be resolved through discussion, or by a third reviewer.

**Data Collection**

Quantitative data will be extracted from papers included in the review using the standardised data extraction tool from the JBI-MAStARI (Appendix II). The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives.

**Data Synthesis**

Quantitative papers will, where possible, be pooled in statistical meta-analysis using the JBI-MAStARI. Odds ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed using the standard Chi-square test. Where statistical pooling is not possible, the findings will be presented in narrative form.
Conflicts of interest

No conflicts of interest noted.

Acknowledgements

The reviewer’s would like to acknowledge Deakin University’s Clinical Care, Quality and Risk Management (CCQRoM) Strategic Research Centre for funding this systematic review through the CCQRoM- Research Grants Scheme.

References


# JBI-MAStARI Critical Appraisal Checklist for Quantitative Studies

## Experimental Studies

<table>
<thead>
<tr>
<th>Reviewer</th>
<th>Date</th>
<th>Author</th>
<th>Year</th>
<th>Record Number</th>
<th>Yes</th>
<th>No</th>
<th>Unclear</th>
</tr>
</thead>
</table>

1. Was the assignment to treatment groups truly random? 
2. Were participants blinded to treatment allocation? 
3. Was allocation to treatment groups concealed from the allocator? 
4. Were the outcomes of people who withdrew described and included in the analysis? 
5. Were those assessing outcomes blind to the treatment allocation? 
6. Were the control and treatment groups comparable at entry? 
7. Were groups treated identically other than for the named interventions? 
8. Were outcomes measured in the same way for all groups? 
9. Were outcomes measured in a reliable way? 
10. Was appropriate statistical analysis used?

Overall appraisal: Include [ ] Exclude [ ] Seek further info. [ ]

Comments (Including reasons for exclusion)
# Comparable Cohort/ Case Control

Reviewer __________ Date __________
Author __________ Year ________ Record Number ________

<table>
<thead>
<tr>
<th>Question</th>
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</thead>
<tbody>
<tr>
<td>1. Is sample representative of patients in the population as a whole?</td>
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<tr>
<td>2. Are the patients at a similar point in the course of their condition/illness?</td>
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<tr>
<td>3. Has bias been minimised in relation to selection of cases and of controls?</td>
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<tr>
<td>4. Are confounding factors identified and strategies to deal with them stated?</td>
<td></td>
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<tr>
<td>5. Are outcomes assessed using objective criteria?</td>
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<tr>
<td>6. Was follow up carried out over a sufficient time period?</td>
<td></td>
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<tr>
<td>7. Were the outcomes of people who withdrew described and included in the analysis?</td>
<td></td>
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<tr>
<td>8. Were outcomes measured in a reliable way?</td>
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<tr>
<td>9. Was appropriate statistical analysis used?</td>
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</tbody>
</table>

Overall appraisal:  Include [ ] Exclude [ ] Seek further info [ ]

Comments (Including reason for exclusion)
**Descriptive and Case Series Studies**

**Type:**

**User:**

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<tr>
<th>Criteria</th>
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<th>Secondary</th>
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<th>Unclear</th>
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</thead>
<tbody>
<tr>
<td>1) Was study based on a random or pseudo-random sample?</td>
<td>No</td>
<td>No</td>
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<tr>
<td>2) Were the criteria for inclusion in the sample clearly defined?</td>
<td>No</td>
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<tr>
<td>3) Were confounding factors identified and strategies to deal with them stated?</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>4) Were outcomes assessed using objective criteria?</td>
<td>No</td>
<td>Yes</td>
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</tr>
<tr>
<td>5) If comparisons are being made, was there sufficient descriptions of the groups?</td>
<td>No</td>
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<tr>
<td>6) Was follow up carried out over a sufficient time period?</td>
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<td>Unclear</td>
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<td>7) Were the outcomes of people who withdrew described and included in the analysis?</td>
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<tr>
<td>8) Were outcomes measured in a reliable way?</td>
<td>No</td>
<td>Yes</td>
<td></td>
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<tr>
<td>9) Was appropriate statistical analysis used?</td>
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Include: [Defined] [Undefined] [Not Applicable]

Reason: 

[Update] [Cancel]
Appendix II

**JBI-MAStARI Data Extraction Form**
for Quantitative Data

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<tr>
<td>Reviewer</td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td></td>
</tr>
<tr>
<td>Setting</td>
<td></td>
</tr>
<tr>
<td>Participants</td>
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</tr>
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<td>Number of Participants</td>
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</tr>
<tr>
<td>Group A</td>
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<tr>
<td>Group B</td>
<td></td>
</tr>
<tr>
<td>Interventions</td>
<td></td>
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<tr>
<td>Intervention A</td>
<td></td>
</tr>
<tr>
<td>Intervention B</td>
<td></td>
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<tr>
<td>Outcome Measures</td>
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</tr>
<tr>
<td>Outcome Description</td>
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</tr>
<tr>
<td>Scale/Measure</td>
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</tbody>
</table>
# Results

## Dichotomous Data

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Treatment Group Number/total number</th>
<th>Control Group Number/total number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

## Continuous Data

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Treatment Group Mean &amp; SD (number)</th>
<th>Control Group Mean &amp; SD (number)</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

Authors Conclusion

_________________________________________________________________

_________________________________________________________________

Reviewers Conclusion

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