

# The development of Version 2 of the AN-SNAP casemix classification system

Janette Green and Robert Gordon

## Abstract

This paper presents the results of a recent review of the Australian National Sub-acute and Non-acute Patient (AN-SNAP) classification system. The AN-SNAP system was developed by the Centre for Health Service Development, University of Wollongong in 1997. The review was conducted between August 2005 and September 2006. Four clinical sub-committees comprising more than 50 clinicians from sub-acute services across New South Wales as well as representatives from Queensland and the Australian Capital Territory were established to develop a set of proposals to be considered for incorporation into Version 2 of the classification.

It is proposed that the final AN-SNAP Version 2 classification will be available for implementation from 1 July 2007.

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**CASEMIX CLASSIFICATIONS** are used routinely in the health sector in Australia and internationally to assist with funding and clinical management. Diagnosis related groups (DRGs), for example, have been used to classify acute care episodes since the early 1980's. To ensure the relevance of these classifications, they need to be reviewed regularly to reflect changes in clinical practice. This paper describes the first review of the Australian National Sub-acute and Non-acute Patient (AN-SNAP) casemix classification.

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## What is known about the topic?

The AN-SNAP classification was developed in a national study that was completed by the Centre for Health Service Development at the University of Wollongong in 1997.

## What does this paper add?

This paper describes the recent review of AN-SNAP that will result in the implementation of Version 2 in 2007.

## What are the implications for practitioners?

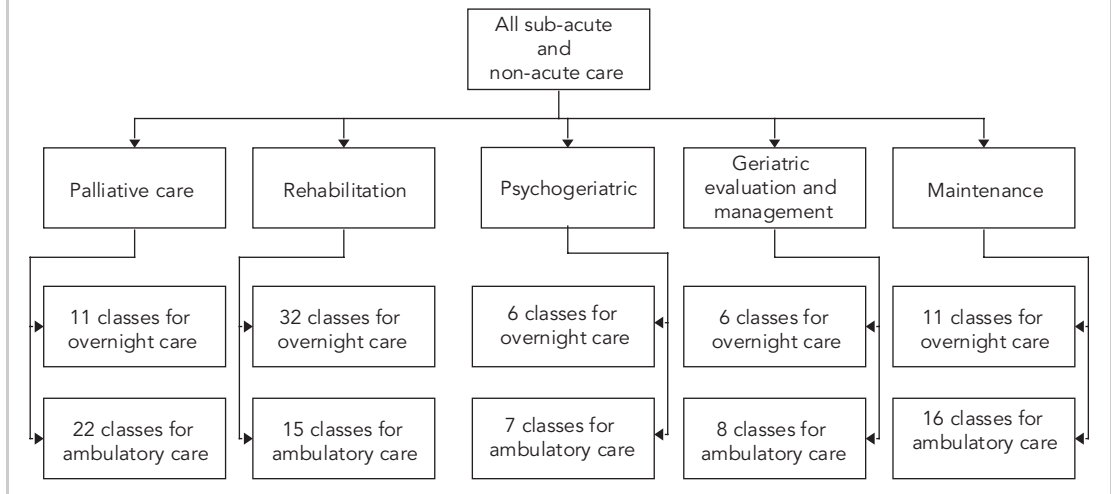
The proposed AN-SNAP Version 2 is currently being circulated to all Australian state and territory health authorities, Australian Government departments, the private sector and other key stakeholder organisations for feedback.

The AN-SNAP classification was developed in a national study that was completed by the Centre for Health Service Development at the University of Wollongong in 1997.<sup>1</sup> The AN-SNAP study involved 99 Australian and 5 New Zealand sites that collected a detailed clinical, service utilisation and cost profile on 30 604 sub-acute and non-acute episodes over a 3-month period. The study sites included public and private sector facilities, and episodes of care captured in the study were provided in inpatient, outpatient and community settings.

The objective of the AN-SNAP study was to develop a casemix classification for sub- and non-acute care. The study was commissioned following several smaller Australian studies that had suggested that this type of care is not adequately classified by systems designed for the acute care sector. In particular, there was growing recognition that patients should be classified by treatment goals, such as improvement in function, rather than diagnosis and procedure.

The outcome of the study was Version 1 of AN-SNAP. The study established the existence of an

# I Structure of the AN-SNAP Classification Version 1



underlying episode classification for sub- and non-acute care in both an overnight and an ambulatory setting. The study results were published in the peer-reviewed literature<sup>2,3,4</sup> and presented at relevant casemix and medical profession conferences.<sup>5,6</sup>

The AN-SNAP Version 1 classification comprises 134 classes across five case types: palliative care, rehabilitation, psychogeriatric, geriatric evaluation and management (GEM), and maintenance care. The definition of each case type is based on both the characteristics of the patient and the goal of intervention.<sup>2</sup> Cost weights were developed for each class.

The classification explained 57.99% of the variance in all episode costs. The overnight branch (for overnight admitted patients only, excluding same-day admitted patients and all ambulatory patients) comprises 66 classes and explained 47.29% of the variance in cost of overnight care. The ambulatory branch (for same-day admitted patients, outpatients and community patients) comprises 68 classes and explained 28.11% of the variance in the cost of ambulatory care. The structure of AN-SNAP version 1 is shown in Box 1.

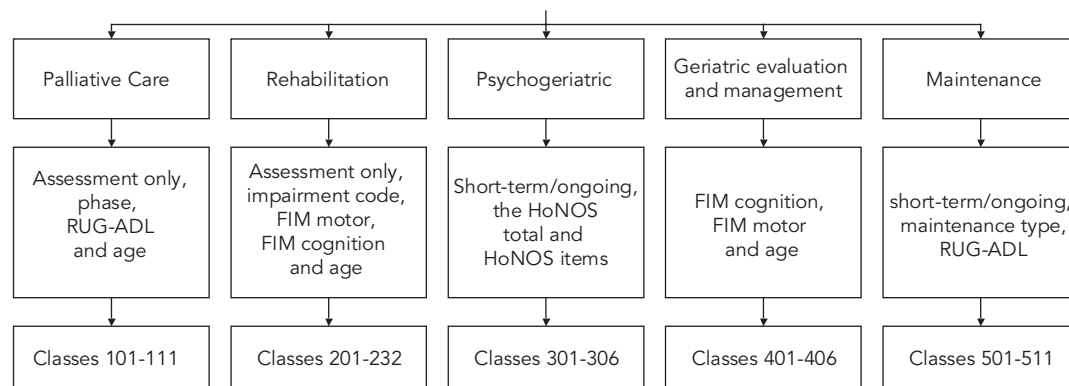
The structure of the overnight branch of the classification is shown in Box 2. For patients in

each case type, information on a number of clinical measures is required.

- In palliative care, the clinical characteristics of the patient that are used in determining the class are the phase tool (stable, unstable, deteriorating, terminal or bereavement), the functional measure “resource utilisation groups — activities of daily living” (RUG-ADL<sup>7</sup>), and age.
- Classes for GEM patients and those undergoing rehabilitation treatment depend on a combination of variables — the functional impairment group as classified by the functional impairment categories,<sup>8</sup> functional scores measured by the functional independence measure (FIM system [Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities Inc, New York, USA])<sup>8</sup> motor and cognitive subscales, and age.
- For psychogeriatric patients, the type of care (short-term or ongoing) and the Health of the Nation Outcome Scale (HoNOS)<sup>9</sup> scores determine the class.
- Within the maintenance case type, classes are determined using RUG-ADL scores, the type of maintenance and the type of care (short-term or ongoing).

The clinical tools on which AN-SNAP class assignment is based, namely the phase tool, the

## 2 Structure of the Overnight Branch of the AN-SNAP Classification Version 1



FIM system, the RUG-ADL and the HoNOS have continued to be routinely used by sub-acute and non-acute services across Australia. Recently, the World Health Organization has released the International Classification of Function (ICF),<sup>10</sup> which is a classification of health-related domains that describe body functions and structures, activities and participation. The ICF provides a useful framework and identifies a range of domains to capture data on functional status using clinical tools such as those in AN-SNAP.

Since its development, the AN-SNAP classification has been used by regulators, funders and providers for a variety of purposes including output-based funding, performance management, benchmarking and quality improvement.<sup>11</sup>

An example of the application of AN-SNAP is in New South Wales where all inpatient sub- and non-acute units have been required to collect AN-SNAP data from 1 July 1999. Episode-based funding based on the AN-SNAP classification and cost weights commenced for these units as part of the NSW episode funding arrangements from 1 July 2005.<sup>11</sup> Similarly, South Australia implemented AN-SNAP for classification and funding purposes for its major rehabilitation units in 2002.

In the private sector, the rehabilitation branch of AN-SNAP was endorsed as the national classification system for rehabilitation services and has been collected by all private rehabilitation hospi-

tals since 2000.<sup>12</sup> The Commonwealth Department of Health and Ageing included AN-SNAP in the Hospital Casemix Protocol data collection from 1 July 2002.

Although AN-SNAP has been used extensively throughout Australia for almost 10 years, a clinical review of the classification had not been undertaken. For this reason, in mid-2005 the NSW Department of Health commissioned a review to develop AN-SNAP Version 2. The objective of the review was to develop a revised version of the classification that reflects current clinical practice and cost structures of sub- and non-acute services.

### Scope of the review

It was agreed with the project sponsor that the scope of the review would be limited to the overnight branch of the classification. While the importance of undertaking further developmental work on the ambulatory branch of AN-SNAP was recognised, it was agreed that this cannot occur until the variables used to assign ambulatory episodes to classes are collected on a routine basis.

Within the overnight branch of AN-SNAP, the primary focus of the review was the rehabilitation and palliative care case types. The availability of data on psychogeriatric, GEM and maintenance episodes was limited to the NSW AN-SNAP

collection, and the number of episodes and contributing hospitals did not constitute a representative sample. However, a number of important issues emerged in relation to these case types that are considered in the discussion section below.

## Method

The review was conducted between August 2005 and September 2006. To facilitate the process, four clinical sub-committees were established, each to review one of the rehabilitation, palliative care, psychogeriatric and GEM branches of the classification. It was agreed that the rehabilitation clinical committee would also review the maintenance branch of AN-SNAP.

The four clinical committees comprised more than 50 physicians, nurses and allied health professionals from sub-acute services across NSW, Queensland and the Australian Capital Territory and included clinicians who work in both the public and private sectors. A combined workshop of each committee was convened at the commencement of the review to develop an overall approach for the study.

The psychogeriatric clinical committee met on one occasion, at which the decision was taken not to continue with the review process for this case type because of a lack of data on which to base any analysis. The GEM clinical committee also met on one occasion, at which it was decided that the classification issues associated with the GEM case type would be further considered by the rehabilitation clinical committee because of the considerable overlap between these two groups.

For the rehabilitation and palliative care clinical committees, the review process involved a series of iterations in which the committees were provided with recent clinical and related data on sub- and non-acute services. Descriptive statistics relating to recent data (as detailed below) were presented, together with possible alternatives to the current classes. Alternative classes were derived using regression tree techniques, using clinical characteristics of patients as the explanatory variables. For rehabilitation, length of stay (as a proxy for cost) was used as the response

variable in the absence of available cost data. This issue is considered further in the discussion section below.

However, in palliative care, there was not such a strong correlation between length of stay and cost, as the intensity of treatment (and hence the cost) increases as the patient nears death. For the palliative care analyses, costs from the AN-SNAP study were used as the response variable. The set of classes that produced the largest reduction in variation (RIV) of the response variable was presented to the relevant committee.

These data were reviewed in a series of meetings to identify potential refinements to the classification. The clinical committees sought to identify areas where clinical practice or other factors may have had an impact on the casemix of sub- and non-acute services since 1996. The types of issues considered included:

- changes in service delivery models;
- changes in diagnostic service patterns;
- changes in technology;
- the availability of new drugs;
- changes in cost structures that may have resulted in non-uniform changes in cost relativities between AN-SNAP classes.

The changes identified by the clinical committees were analysed to test the impact on the statistical performance of the classification. The results of the analysis were fed back to the clinical committees for further clinical consideration. This process was repeated until a final set of classes, that represented the best clinical and statistical result, was agreed to form the basis of AN-SNAP Version 2. The software used in the analyses included Microsoft Excel, Microsoft Access (Microsoft Corporation, Redmond, Wash, USA) and PC-Group (Austin Data Management Associates, Texas, USA).<sup>13</sup>

## Source data for the classification review

Three sources of data were obtained for the review. Firstly, although 9 years old, the data collected in the 1996 AN-SNAP study provided the most comprehensive data source. It included clinical variables as well as detailed service utilisation and financial data across all five AN-SNAP

### 3 Source data for the classification review

Source and period	Sector	Number of units	Number of episodes by case type	
<b>1996 AN-SNAP Study</b>	Public and private	86	Palliative Care	1 868
1 July to 30 September 1996			Rehabilitation	7 397
(brain injury and spinal cord injury			Psychogeriatric	479
units – 1 July 1996 to 31			GEM	1 882
December 1996)			Maintenance	1 565
			<b>Total</b>	<b>13 191</b>
<b>Australasian Rehabilitation Outcomes Centre</b>	Public and private	120	Rehabilitation (2004)	39 645
2004 and 2005 calendar years			Rehabilitation (2005)	44 525
			<b>Total</b>	<b>84 170</b>
<b>NSW Health – AN-SNAP Data Collection</b>	Public	60	Palliative Care	10 505
2003 and 2004 calendar years			Rehabilitation	28 370
			Psychogeriatric	652
			GEM	4 314
			Maintenance	2 881
			<b>Total</b>	<b>46 722</b>

GEM = geriatric evaluation and management.

case types. This dataset was used to provide support for proposed alternative classes and, where appropriate, to investigate cost relativities between them. Only the data relating to the 13 191 episodes of overnight admitted patients were used in this review.

Secondly, data were obtained for the 2004 and 2005 calendar years from the Australasian Rehabilitation Outcomes Centre (AROC). This dataset comprised clinical data on 84 170 rehabilitation episodes from about 120 public and private sector units in all Australian states and territories except the ACT. AROC routinely collects from these units an agreed dataset that includes all of the variables used in the AN-SNAP classification. The 2004 AROC data were used to develop alternative rehabilitation classes and the 2005 data were used to test the generalisability of the proposed classes.

Finally, data were obtained from the NSW Department of Health from about 60 sub- and non-acute units participating in the NSW AN-SNAP data collection. Again, this data collection includes the variables required to assign episodes to the AN-SNAP classification and comprised

over 46 000 episodes of care across all five AN-SNAP case types. These data were used to develop alternative palliative care classes and to derive a profile of patients in the other case types.

Box 3 provides a summary of the data that were used in the review process.

Cost weights were derived for the proposed AN-SNAP version 2 classes. Cost data from its 2003 and 2004 annual hospital cost data collection were provided by NSW Health. However, most hospitals participating in the data collection used a cost-modelling approach that used existing AN-SNAP cost weights. The use of these costs in the review process would, by definition, be circular and was not therefore considered appropriate.

It was agreed instead to use the 1996 AN-SNAP study data to calculate cost weights for the new classes where no changes in cost relativities had been identified. This process was guided by advice from the clinical committees regarding any changes in cost structures that may have affected the cost relativities between classes. Where it was unclear whether or not cost relativities had changed, the committees discussed alternative processes to determine cost weights.

## Results

The review process resulted in a proposed AN-SNAP Version 2 that comprises 83 classes in the overnight branch. As the classes for each of the case types were developed using different datasets, the statistical performance for each branch will be presented separately.

An additional set of recommendations was developed relating to refining definitions, ongoing education and implementation issues associated with the AN-SNAP classification. The outcome of the review process and the recommended changes for each case type are presented below.

### **Palliative care**

The palliative care clinical committee held four full-day meetings and one teleconference. The key objective was to review the existing classes to ensure that they reflect current clinical practice.

The committee was of the view that, overall, there have not been substantial changes in clinical practice within the palliative care sector during the last 10 years. There have, however, been changes in the clinical and demographic profile of patients that have had an impact on the way clinical care is provided. In particular, there has been an increase in the proportion of non-cancer diagnoses and an increase in the average age of palliative care patients. In addition, there is now a wider and more expensive range of drugs routinely used in treating palliative care patients. It was agreed that these changes do not warrant modifying the structure of the classification. The availability of new drugs highlights the need to obtain more current cost data.

Much of the discussion at the meetings centred on the use of the phase tool. In particular, some members of the committee were of the view that there can be differences in interpretation between the unstable and deteriorating phases with the difference possibly depending on whether a change in a patient's condition is considered "expected" or not. This has the potential for the allocation to either of these

phases to be subjective and dependent on the experience of the clinician making the decision. It was recommended that further education be undertaken to address this issue. Two case studies were discussed at the meetings, but it was acknowledged that the committee's role was not to develop clearer definitions.

Another concern of the committee related to the bereavement phase which is included in the tool as an acknowledgement of the considerable workload for staff following the death of a patient. It was reported that different hospitals vary in their use of the phase, with some allocating it to all patients who die and others allocating it to none. However, the reasons for this relate more to the administrative difficulties of reconciling different service utilisation datasets than the clinical merit of the bereavement phase. The committee considered a better name for this phase would be "immediate post death support" and that differences in its use were best addressed by the business rules surrounding the classification.

The major objective of the committee was to determine whether the existing AN-SNAP classes are still appropriate.

All classes in the palliative care branch of the AN-SNAP classification are based on the patient's phase of illness so that any changes to the tool would have immediate consequences for the classes. However, it was acknowledged by the committee that their recommendation to change the phase tool has implications beyond the AN-SNAP classification and would need to be considered within the larger palliative care community. They therefore discussed two alternative changes to the AN-SNAP classes, one based on a phase tool in which the unstable and deteriorating phases are combined and the other based on the existing phase tool.

In the existing classification, patients in the deteriorating phase are separated into different classes based on their functional independence. It was the clinicians' view that the range of function scores that place them in the highly dependent class should be extended. They also considered that the age of these patients makes a

difference to the level of care required, with those younger than about 50 requiring a higher level of resources. When the data were tested for evidence to support this theory, it was found that splitting at a slightly different functional score than in the current classes and then dividing the lowest function group between the ages of 52 and 53 was statistically equivalent to the current splits into classes.

If, on the other hand, the unstable and deteriorating phases were to be combined, the classes for patients in this single phase would be formed by separating according to the same functional and age splits as recommended for the deteriorating phase in the alternative proposal. Again, this recommendation was based on a combination of statistical evidence and expert clinical advice.

No changes were recommended for the other palliative care classes in the existing classification.

Statistically, there was little difference between the two options and the existing classes. Using Version 1 AN-SNAP palliative care classes and the 1996 study database, the RIV was 20.98%. The classes recommended for Version 2 using the existing phase tool produced an RIV of 19.67%, while for those based on the modified phase tool the RIV was 20.42%.

At a subsequent meeting of the NSW Health AN-SNAP implementation committee, it was agreed to adopt the AN-SNAP Version 2 classes that are based on the phase tool in its current form. It was also acknowledged that this decision may need to be reviewed, pending the outcome of other work currently being conducted on the phase tool and its definitions.

Another role of the committee was to consider the existing cost weights for the classes. In particular, there was concern that pharmaceuticals have become more widely prescribed for palliative care patients and that they have become much more expensive since the original study was conducted in 1996. It is possible that the increases in the use of these new drugs would not be spread uniformly among the classes so that the existing cost relativities may

no longer be applicable. However, current cost data were not available at the level required to make reliable recommendations about changes to the cost weights. The committee therefore recommended a small costing study be undertaken to investigate changes to the costs associated with the provision of palliative care.

### **Rehabilitation**

The rehabilitation clinical committee met four times, reviewing a different set of impairment categories at each meeting. In addition, two supplementary teleconferences were held. As was the case with palliative care, the committee agreed that there has not been a substantial change in clinical practice within the rehabilitation sector during the last 10 years, although they did identify a move to provide proportionally more services on a non-inpatient basis. Where changes have occurred, they are reflected in a different clinical and demographic profile of patients that receive inpatient rehabilitation care. The committee identified the main effect of this as likely to be a change in the distribution of patients across classes, rather than a change in the relative costs between the classes.

The committee recommended an AN-SNAP Version 2 that comprises 45 rehabilitation classes. This is in contrast to the 32 classes in AN-SNAP Version 1. Using the 2004 AROC data and length of stay as the response variable, these classes produced an RIV of 26.72%. This is a slight increase on the RIV of 24.07% resulting from the Version 1 classes.

For two impairment groups, the recommended change to the classification is limited to a change in the range of motor function scores that define each class. For the neurological impairment group, the number of classes increases from three to four. For the amputation impairment group, the number of classes decreases from three to two.

In the current AN-SNAP classification, the Cardiac, Pain and Major Multiple Trauma impairment groups have a single class. For each of these, the committee recommended that the impairment group be more clearly defined to

ensure consistency in the allocation of patients. In addition, they recommended that the class for Major Multiple Trauma patients be subdivided into four classes based on the total functional score (motor plus cognitive). This is the only impairment group for which the total score is to be used.

Almost 45% of rehabilitation episodes are for patients with Orthopaedic Conditions. The committee's recommendation for this impairment group was to increase the existing four classes to ten. These would be formed by splitting firstly on a finer level of impairment (fracture, replacement or other), then by the functional motor score of the patient on admission. For patients who have had a fracture and are admitted with a low functional score, there would be a further split based on their cognitive function score.

Stroke accounts for about 11% of rehabilitation episodes each year in the AROC dataset. In the current AN-SNAP classification, there are five stroke classes. Burns patients are also assigned to these classes. There are very few patients admitted for rehabilitation following a burn (roughly 20–30 per year nationally). The committee recommended that they be grouped into one of the Major Multiple Trauma impairment groups, rather than being grouped with stroke patients. They further recommended that the existing stroke class for patients with moderate motor function scores be split based on the patient's cognitive function score.

Clinicians on the committee were concerned that for brain injury patients the FIM is not the best measure to use for patients who are in the Brain Dysfunction impairment group. Instead, they recommended that the Post Traumatic Amnesia (PTA) duration score be investigated as an alternative. Some preliminary analysis was conducted on existing data, investigating the relationship between PTA duration score, FIM score and length of stay. However, there were insufficient data to provide reliable guidance to the committee. They therefore recommended that a further study be conducted on this issue. They further recommended that the existing

four classes be increased to six, based on motor function scores and, for those with the highest motor function, on cognitive function score.

Other patients are grouped into one of the four classes for other impairments. Since the beginning of AN-SNAP data collections, the proportion of episodes allocated to these classes has been increasing. There is some concern that many of these extra episodes would formerly have been classified as GEMs. The committee recommended that further work be undertaken to investigate this issue and that, in the meantime, the existing classes for All Other Impairments remain unchanged.

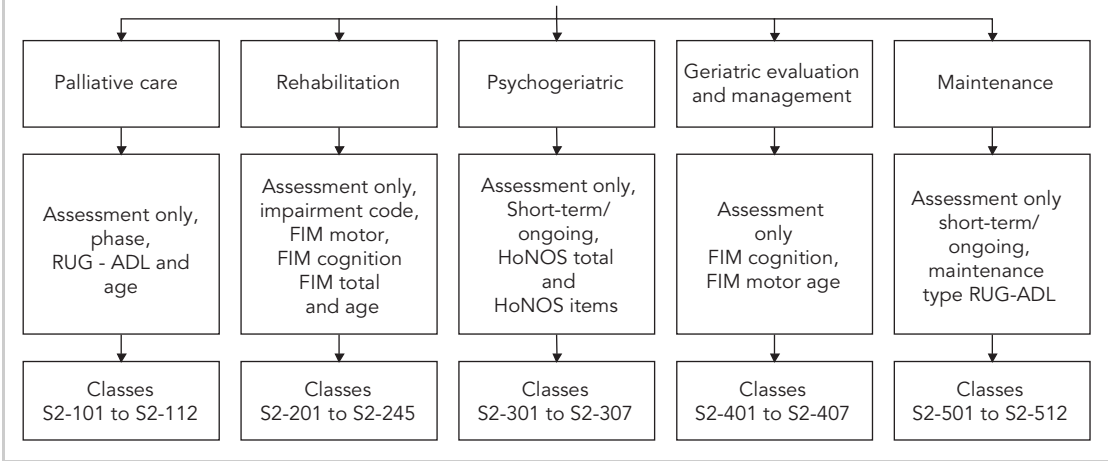
In considering changes to each impairment group, the committee considered whether the cost relativities between classes may have changed since the development of AN-SNAP Version 1. In the absence of current cost data, the committee was unable to identify these types of changes. The issue of cost data is discussed below.

One of the recommendations from this committee related to the "90-day" business rule. When the AN-SNAP classification was developed, it was recommended that episodes with a length of stay of more than 90 days be ended and a new episode started, following a clinical review. The committee felt that this was unnecessary clinically and suggested that it leads to unnecessary administrative complexities. The recommendation was to not continue its use in the NSW AN-SNAP data collection.

Although the "90 day" business rule is not part of the AN-SNAP classification, the decision regarding its use potentially has an impact on potential changes to several AN-SNAP classes. In particular, patients with a spinal cord dysfunction and those with the very lowest motor function score are likely to be the most affected by this rule, as they often have very long lengths of stay. Consequently, the committee recommended that almost all the classes for these patients remain unchanged, pending further review when sufficient data become available. The one exception was the class for spinal patients with low motor function scores. It was



#### 4 Recommended structure of the overnight branch of the AN-SNAP Classification Version 2



recommended that this class be split in two, depending on whether the patient was more than 32 years old or not.

### Discussion

A revised version of the AN-SNAP classification has been developed (Box 4). It is based on available data on sub-acute and non-acute activity in Australia in 2004 and 2005. An extensive process of clinical review and statistical analyses was undertaken to ensure that the revised classification reflects changes in clinical practice and cost structures that have occurred since the first version of the classification was released in 1997.

Implementation of AN-SNAP Version 2 is a matter for individual jurisdictions. However, in the view of the authors, the review process has identified changes in clinical practice and cost structures that have occurred since 1997 and may have an impact on the classification. Implementation is planned for NSW from 1 July 2007.

Overall, three major recommendations emerged from the review process. Firstly, further work is required in relation to the review of the psychogeriatric and GEM branches of the classification. Secondly, there is a need to conduct ongoing training and education work for clinicians using AN-SNAP. Finally, further work is

required to produce more current cost weights for the revised classification. Each of these recommendations is discussed below.

In relation to the psychogeriatric and GEM branches of the classification, the study was not able to conduct an effective review. For these case types, the only data that could be obtained within the scope of the study were from the NSW AN-SNAP data collection. However, only a small number of facilities in NSW currently classify any episodes as either GEM or psychogeriatric. This was not the case when the AN-SNAP study was conducted in 1996.

In relation to GEM, there are two possible explanations for this change. It may be that these episodes are being classified as rehabilitation episodes and being assigned to the Debility or Other Disabling Impairments categories. Alternatively, it is possible that these episodes are being classified as acute. In any event, the low volume of GEM episodes is more likely to occur in NSW than in other jurisdictions where there are stand-alone GEM units.

The recommendation for this case type is to continue with the current classification of GEM classes pending further work. This should include obtaining data from jurisdictions such as Victoria where patients in GEM units are routinely classified as GEM.

In relation to psychogeriatric episodes, the majority of psychogeriatric units in NSW are now funded as mental health services rather than aged care services. As such, they do not participate in the AN-SNAP data collection. Again, the recommendation for this case type is to continue with the current classification of psychogeriatric classes pending further work. This work could include other jurisdictions and a broader policy consideration of the issues around the classification of psychogeriatric care.

The second key recommendation relates to the need for ongoing training and education for staff involved in the use of the AN-SNAP classification. The recommendations from the palliative care clinical committee, in particular, were largely about education of clinical staff and clarification of business rules surrounding the classification.

These issues are also currently being addressed by the Palliative Care Outcomes Collaboration, a national initiative aiming, among other things, to develop and implement a national data collection for palliative care services. It is important for the palliative sector to work cooperatively to ensure that a coordinated approach is adopted to classification, benchmarking and quality improvement initiatives.

The final key recommendation relates to the lack of reliable cost data. AN-SNAP Version 1 classes were based on episodes costed on a daily basis in the 1996 study. A shortcoming of the current study was that episode costs were not available for the 2003, 2004 and 2005 clinical data used in the review process. Instead, for the analysis of the rehabilitation data, length of stay was used as a proxy measure for cost. For future work, it is hoped that episode cost data may be available from jurisdictions that have patient costing systems in place. It may also be possible to derive estimates of episode costs based on Hospital Casemix Protocol charge data for episodes provided in the private sector.

Although the correlation between cost and length of stay is high, it is not perfect. Patients who require more intensive treatment will not be identified if this doesn't add to their length of stay in hospital. Indeed, in palliative care, the amount

of treatment provided intensifies as the patient approaches death. For this reason, cost data from the 1996 study were used rather than length of stay for the analysis of palliative care data.

The lack of cost data at an episode level also meant that it was not possible to identify changes to the cost relativities between classes. Cost weights for the new classes have been calculated using 1996 data. However, where the committees suggested that the relative costs may have changed, a small cost study could be conducted to identify current cost relativities.

Following the review, the technical report<sup>14</sup> outlining the proposed AN-SNAP Version 2 classification was circulated to all Australian state and territory health authorities, Australian Government departments, the private sector and other key stakeholder organisations for feedback. It is proposed that the final AN-SNAP Version 2 of the classification will be available for implementation from 1 July 2007.

## Acknowledgements

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The NSW Department of Health commissioned this review, provided some data and were represented at meetings where the discussion informed the analysis and interpretation, however they did not assist with the writing of the article.

## Competing interests

The authors declare that they have no competing interests.

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