

# Defining an episode of care: A study of five Case Types

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## Abstract

*This is the first study in Australia to test definitions of various types of 'episodes of care'. The definitions reported here are those used in the 1996 National Sub-Acute and Non-Acute Patient (SNAP) Casemix Classification Study.*

*The study collected data on a total of 683 patients at 10 hospitals and 2 community health services providing a range of rehabilitation, aged care and community care services. The kappa statistic ( $k$ ) was used to determine the significance of the level of agreement between raters. The value of kappa was 0.838 with a 95 per cent confidence interval of 0.801 to 0.975.*

*The results of this study are encouraging and support the use of the five Case Types – Palliative Care, Rehabilitation, Psychogeriatric, Geriatric Evaluation and Management, and Maintenance Care. All five Case Types proved to have good inter-rater reliability, there was a good fit for most patients, and staff found the definitions easy to use.*

## Introduction

The question of how to define an episode of patient care has been the subject of much recent debate. This debate was triggered in part by the 1992 report of the National Patient Abstracting and Coding Project (Eagar & Innes 1992a, 1992b). Eagar and Innes argued that an episode of care should not be defined as that care which begins at admission and ends at discharge. Instead, they proposed that the definition of an episode of care be based on the acuity of the patient and the goal of care. They also proposed that the AN-DRG (Australian national diagnosis related group) classification be used to classify only 'acute' patient episodes of care and that existing information systems be amended to allow for 'statistical type changes' within the one hospitalisation.

In response to that report, the Australian Health Ministers' Advisory Council (AHMAC) agreed in 1992 to the introduction of a standardised national data collection system to distinguish between different episodes of inpatient care (AHMAC 1992). The AHMAC resolutions are important. An episode of inpatient care is no longer defined as being the complete period from admission to discharge. Nor is it defined by the name of the ward to which the patient is admitted. Instead, it is now recognised that a patient can move through two or more acuity episodes during the one stay in hospital. Indeed, in the case of palliative care, it is recognised that an episode of care may continue after the death of the patient.

A definition of acute care was subsequently developed and included in version 4.0 of the *National Health Data Dictionary* on the basis that it be used only for casemix definition development until it had been tested and refined. In the process, the National Health Information Management Group recommended that the boundaries between care types be defined to allow for the identification of the beginning and end of an episode of care (Australian Institute of Health and Welfare 1995).

The most recent version of the *National Health Data Dictionary* (version 5.0) defines an episode of care as a phase of treatment and recognises six types of episode – acute, rehabilitation, palliative care, non-acute care, unqualified neonate, and other care (Australian Institute of Health and Welfare 1996). Consistent with the National Health Information Agreement, all States and Territories are implementing these definitions.

None of the definitions now incorporated in the *National Health Data Dictionary* have been subjected to testing and, in the absence of data, there are questions about their validity, reliability and clinical meaning. These questions apply equally to all episode types.

This paper presents the results of the first study undertaken to test definitions of care that is not 'acute' care. The definitions were developed by the Clinical Project Team of the National Sub-Acute and Non-Acute Casemix Classification Study (Centre for Health Service Development 1996).

The definitions reported here are those employed in the 1996 National Sub-Acute and Non-Acute Casemix Classification Study. In addition to testing inter-rater reliability, the purpose of the study was to ascertain the views of clinical assessors regarding the adequacy of the Case Type definitions for the classification of sub-acute and non-acute patients and to assess the goodness of fit of the definitions.

Five Case Types are included in the National Sub-Acute and Non-Acute Casemix Classification Study and a key research hypothesis to be tested is whether each Case Type is clinically distinct as measured by the patient attributes to be captured in that study. An algorithm is used to assign each patient to one, and only one, Case Type. In the event that there is more than one Case Type which could appropriately define an episode, the episode is allocated to the first Case Type identified in the algorithm. The five Case Types listed in the order in which they appear in the algorithm are:

1. Palliative Care
2. Rehabilitation
3. Psychogeriatric
4. Geriatric Evaluation and Management
5. Maintenance Care.

Each Case Type has been defined by *describing the patient*, by defining the *goal of care*, and by *describing the service characteristics* for the Case Type.

The definitions of the five Case Types are included in the appendix.

## Method

Data were collected at 10 hospitals and 2 community health services in New South Wales, Victoria, South Australia and Western Australia. Sites in the study provide a range of rehabilitation, aged care and community care services. One site (representing less than 10 per cent of all observations) is a designated rehabilitation centre. Four sites provide a range of acute, rehabilitation and aged care services, whilst seven sites provide a range of rehabilitation and aged care but no acute care. Specialist palliative care services and specialist adult mental health services were excluded from the study because these units rarely care for patients whose episode is other than palliative care or mental health.

A study coordinator at each site provided instructions to raters and managed the on-site data collection. Site coordinators selected two clinical staff from each ward/service to participate in the pilot study. The clinical staff members acting as raters included registered nurses, specialist medical staff, medical registrars and allied health staff.

The site coordinators provided each rater with the definitions of each Case Type and ensured that they were familiar with the Case Type assignment logic. Each rater was given a written instruction sheet instructing them to assign each patient to one, and only one, Case Type.

Using a scale of 0 to 4, where 0 indicates 'Very poor fit' and 4 indicates 'Very good fit', raters were asked to indicate how well the Case Type described the key attributes or characteristics of each patient. Likewise, raters were asked to assess how difficult it was to assign each person to a Case Type. A scale of 0 to 4 was used for this purpose, with 0 indicating 'Very easy' and 4 indicating 'Very difficult'.

Raters could also indicate if the patient did not fit into any of the five Case Types or, conversely, if the patient met the description of more than one Case Type. Finally, raters were asked to indicate any patient where they were not sufficiently familiar with the person's clinical condition to be confident about these ratings.

Each patient on the ward/receiving care was assessed independently by the two clinical raters and allocated to one of the five SNAP Case Types. Each assessment was made by each rater without discussion with the other rater. Both assessments were completed within the one 24-hour period. Single assessments were also collected for any patient/community client who was seen by only one practitioner on the day of assessment. These assessments were to be used solely to assess goodness of fit and ease of use.

After the data had been collected, clinical assessors were interviewed, either individually or in a group, by the site coordinator to identify any problems experienced in undertaking the required tasks and any suggestions for improving the wording of the definitions. These were documented and forwarded to the study team.

## Results

In total, 683 patients were classified to one of the five Case Types. Of this total number, 559 patients (81.8 per cent) were assessed by two raters and 124 (18.2 per cent) by one rater. As expected, most of the sole ratings occurred in community settings where the patient was seen by only one practitioner on the day of assessment. These cases were excluded from the analysis of inter-rater reliability but included for other analyses.

Figure 1 shows the ratings for the 559 patients assessed by two raters. It also shows each combination as a percentage of total observations. There was a perfect match for 496 (88.7 per cent) patients. For the remaining 63 (11.3 per cent) patients, the largest number of mismatches are between Rehabilitation and Geriatric Evaluation and Management (19 or 3.4 per cent of total observations) and Rehabilitation and Maintenance Care (18 or 3.2 per cent). However, there were also a small number of mismatches for all other combinations except Palliative Care and Rehabilitation.

|           | Rater one                           |                 |                |                 |                                     |                  |       |
|-----------|-------------------------------------|-----------------|----------------|-----------------|-------------------------------------|------------------|-------|
|           |                                     | Palliative Care | Rehabilitation | Psychogeriatric | Geriatric Evaluation and Management | Maintenance Care | Total |
| Rater two | Palliative Care                     | 21 (3.76%)      | 0 (0%)         | 1 (0.18%)       | 1 (0.18%)                           | 4 (0.72%)        | 27    |
|           | Rehabilitation                      |                 | 232 (41.5)     | 2 (0.36%)       | 19 (3.40%)                          | 18 (3.18%)       | 271   |
|           | Psychogeriatric                     |                 |                | 41 (7.33)       | 2 (0.36%)                           | 4 (0.72%)        | 47    |
|           | Geriatric Evaluation and Management |                 |                |                 | 85 (15.2)                           | 12 (2.15%)       | 97    |
|           | Maintenance Care                    |                 |                |                 |                                     | 117 (20.93)      | 117   |
|           | Total                               | 21              | 232            | 44              | 107                                 | 155              | 559   |

Figure 1: Results of two rater assessments

Table 1 shows the mismatches in more detail. Three types of mismatch account for 78 per cent of all mismatches – Rehabilitation/Geriatric Evaluation and Management; Geriatric Evaluation and Management/Maintenance Care and Rehabilitation/Maintenance Care. Rehabilitation, Geriatric Evaluation and Management and Maintenance Care also account for 78 per cent of all matches.

**Table 1: Mismatch by Case Type**

| <b>Case Type Rater 1</b>            | <b>Case Type Rater 2</b>            | <b>Total number</b> | <b>Percentage of all mismatches</b> |
|-------------------------------------|-------------------------------------|---------------------|-------------------------------------|
| Palliative Care                     | Psychogeriatric                     | 1                   | 1.59                                |
| Palliative Care                     | Geriatric Evaluation and Management | 1                   | 1.59                                |
| Palliative Care                     | Maintenance Care                    | 4                   | 6.35                                |
| Rehabilitation                      | Psychogeriatric                     | 2                   | 3.18                                |
| Rehabilitation                      | Geriatric Evaluation and Management | 19                  | 30.16                               |
| Rehabilitation                      | Maintenance Care                    | 18                  | 28.57                               |
| Psychogeriatric                     | Geriatric Evaluation and Management | 2                   | 3.18                                |
| Psychogeriatric                     | Maintenance Care                    | 4                   | 6.35                                |
| Geriatric Evaluation and Management | Maintenance Care                    | 12                  | 19.05                               |

The kappa statistic (k) was used to determine the significance of the level of agreement between raters. The kappa co-efficient of agreement is the ratio of the proportion of times that the raters agree (corrected for chance agreement) to the proportion of times that the raters could agree (corrected for chance agreement). The value of kappa was 0.838 with a 95 per cent confidence interval of 0.801 to 0.875.

## **Goodness of fit**

Each rater used a scale of 0 to 4 to indicate how well each Case Type described the key attributes or characteristics of each patient. A score of 0 indicated 'Very poor fit' and a score of 4 indicated 'Very good fit'. Goodness of fit was calculated based on a total of 683 patients. This includes the 124 patients with only one rater. The average goodness of fit score was 3.48, indicating that there was a good fit for most patients. Table 2 shows the goodness of fit score by Case Type. At 3.70 with two raters and 3.44 with one rater, the Maintenance Care Case Type had the best fit score. Among the Case Types, Geriatric Evaluation and Management had the lowest fit score (3.27). Not surprisingly, the mismatch group Rehabilitation/Geriatric Evaluation and Management has the lowest score overall (2.90), indicating that these patients did not fit the definitions as well as other patients assigned to either Rehabilitation or Geriatric Evaluation and Management.

## **Ease of assignment**

Each rater used a scale of 0 to 4 to indicate how easy it was to assign each patient to a Case Type. A score of 0 indicated 'Very easy' and a score of 4 indicated 'Very difficult'.

Again, ease was calculated based on a total of 683 observations. The average ease score was 0.91, indicating that there were no significant difficulties assigning sub-acute and non-acute patients to one of the five Case Types.

Table 3 shows the ease of assignment score by Case Type. At 0.54 with two raters and 0.17 with one rater, the Psychogeriatric Case Type had the best ease score. Among the Case Types, Geriatric Evaluation and Management had the lowest ease score (1.15). Overall, the match groups have better ease of assignment scores than the mismatch groups. However, the numbers in some cells are very small and so it is difficult to draw any definitive conclusions.

## **Feedback on the Case Types**

Raters were asked to identify any patient who could be assigned to more than one Case Type and to identify patients who did not meet the description of any Case Type. In addition, raters were asked to identify any patient where the rater was not sufficiently familiar with the person's clinical condition to be confident about the ratings given.

**Table 2: Goodness of fit by Case Type**

| <b>Rater 1</b>                      | <b>Rater 2</b>                      | <b>Number of raters</b> | <b>Mean fit score</b> |
|-------------------------------------|-------------------------------------|-------------------------|-----------------------|
| Palliative Care                     | Palliative Care                     | 40                      | 3.54                  |
| Rehabilitation                      | Rehabilitation                      | 464                     | 3.56                  |
| Psychogeriatric                     | Psychogeriatric                     | 82                      | 3.54                  |
| Geriatric Evaluation and Management | Geriatric Evaluation and Management | 150                     | 3.27                  |
| Maintenance Care                    | Maintenance Care                    | 212                     | 3.70                  |
| Palliative Care                     | Nil                                 | 7                       | 4.00                  |
| Rehabilitation                      | Nil                                 | 30                      | 2.93                  |
| Psychogeriatric                     | Nil                                 | 6                       | 4.00                  |
| Geriatric Evaluation and Management | Nil                                 | 36                      | 3.27                  |
| Maintenance Care                    | Nil                                 | 45                      | 3.53                  |
| Palliative Care                     | Psychogeriatric                     | 2                       | 3.00                  |
| Palliative Care                     | Geriatric Evaluation and Management | 2                       | 3.50                  |
| Palliative Care                     | Maintenance Care                    | 8                       | 3.14                  |
| Rehabilitation                      | Psychogeriatric                     | 4                       | 3.00                  |
| Rehabilitation                      | Geriatric Evaluation and Management | 40                      | 2.90                  |
| Rehabilitation                      | Maintenance Care                    | 38                      | 3.19                  |
| Psychogeriatric                     | Geriatric Evaluation and Management | 4                       | 4.00                  |
| Psychogeriatric                     | Maintenance Care                    | 8                       | 3.48                  |
| Geriatric Evaluation and Management | Maintenance Care                    | 28                      | 3.14                  |



**Table 3: Ease of assignment by Case Type**

| <b>Rater 1</b>                      | <b>Rater 2</b>                      | <b>Number of raters</b> | <b>Ease of assignment</b> |
|-------------------------------------|-------------------------------------|-------------------------|---------------------------|
| Palliative Care                     | Palliative Care                     | 40                      | 1.02                      |
| Rehabilitation                      | Rehabilitation                      | 464                     | 0.78                      |
| Psychogeriatric                     | Psychogeriatric                     | 82                      | 0.54                      |
| Geriatric Evaluation and Management | Geriatric Evaluation and Management | 150                     | 1.15                      |
| Maintenance Care                    | Maintenance Care                    | 212                     | 0.72                      |
| Palliative Care                     | Nil                                 | 7                       | 0                         |
| Rehabilitation                      | Nil                                 | 30                      | 1.87                      |
| Psychogeriatric                     | Nil                                 | 6                       | 0.17                      |
| Geriatric Evaluation and Management | Nil                                 | 36                      | 1.62                      |
| Maintenance Care                    | Nil                                 | 45                      | 1.11                      |
| Palliative Care                     | Psychogeriatric                     | 2                       | 0.5                       |
| Palliative Care                     | Geriatric Evaluation and Management | 2                       | 2.00                      |
| Palliative Care                     | Maintenance Care                    | 8                       | 3.00                      |
| Rehabilitation                      | Psychogeriatric                     | 4                       | 1.50                      |
| Rehabilitation                      | Geriatric Evaluation and Management | 40                      | 1.48                      |
| Rehabilitation                      | Maintenance Care                    | 38                      | 0.82                      |
| Psychogeriatric                     | Geriatric Evaluation and Management | 4                       | 0.25                      |
| Psychogeriatric                     | Maintenance Care                    | 8                       | 1.88                      |
| Geriatric Evaluation and Management | Maintenance Care                    | 28                      | 0.78                      |

Raters indicated that 11.7 per cent of cases could be assigned to more than one Case Type and included a brief description of difficult cases. These cases were spread across all Case Types. In total, 3.4 per cent of patients did not meet the criteria for any Case Type. These patients were mostly identified as acute care. There were 12 cases where one or other of the raters indicated that they were not sufficiently familiar with the person's condition.

## Discussion

The results of this study are encouraging and the five Case Types are to be employed in the 1996 National Sub-Acute and Non-Acute Casemix Classification Study. Although there were some differences in the performance of the five Case Types, all five proved to be reliable. Most patients fitted into only one Case Type and staff found the definitions easy to use.

The kappa value indicates that there is very good inter-rater reliability. Likewise, the assessments completed by the raters indicated that they found the definitions easy to use. In addition to the quantitative ratings reported above, raters also provided subjective comments on the definitions and their application. Raters reported that they were happy with the wording of the definitions of the five Case Types and had few suggestions for improving them.

For raters in a community setting, the key issue was the boundary between primary care, post-acute care and maintenance care. For example, it was unclear to community raters whether care of a patient with a chronic leg ulcer was primary care or maintenance care. A further example given was an elderly lady referred for monitoring and wound dressings following surgery. She was expected to require dressings for 6–12 weeks. The rater found it hard to determine if this was acute, post-acute or maintenance care.

With the exception of this one issue, community raters indicated no significant difficulties with applying the definitions. On the whole, their inter-rater results, goodness of fit scores and ease of use scores were equivalent to, or better than, those of hospital-based raters.

The issue of the boundary between acute care and other care was also raised by some hospital raters. Some suggested that a clearer definition of acute care is required.

However, a more important issue in this study is whether assignment to a Case Type is based on the reason for admission/episode start (a prospective assessment) or on an assessment of the whole episode (an assessment that can be made concurrently or retrospectively). This study was a snapshot study. It captured all

patients receiving care on a specific day. As such, most patients were well into an episode of care at the point at which they were assessed. Vignettes provided by the raters indicated that some patients had been admitted for one reason and, subsequent to the admission, new problems had emerged which required a new care plan. The most obvious example given was a patient admitted for palliative care who fractured their femur during the hospital stay. The patient is now receiving rehabilitation. However, there were other less extreme examples. This includes patients who were admitted for rehabilitation and who have subsequently demonstrated little capacity for functional improvement.

An analysis of the comments provided indicates that about half of the mismatches occurred because one rater based their assessment on reason for episode start and the other rater based their assessment on the situation at the time of rating. Not all raters commented on all patients subsequently in the mismatch cohort and so a more detailed analysis is not possible.

There are two differences between this inter-rater study and the way that the definitions are applied in the National Sub-Acute and Non-Acute Casemix Classification Study. In the latter study, all patients will be assigned to a Case Type at the start of their episode of care. Further, for patients whose Case Type changes during the one hospitalisation or episode of community care, there will be capacity for a 'type change'. Episode end data will be collected when a type change occurs and the patient will be admitted to a new Case Type. All patient data items will be repeated at each type change. This should overcome the problems reported in this study.

Finally, some raters reported difficulties with assignment when the evidence as stated in the definition was not available. For example, the study cohort included six patients admitted to a designated rehabilitation unit and who were reported as receiving rehabilitation. However, there was no rehabilitation plan and no indicative time frame. This issue has implications for both quality and for funding. The section 'as evidenced by' is included in the definitions to minimise the capacity for manipulating the classification in order to receive a higher level of funding. It is reasonable to expect evidence to exist if a provider is to be funded for providing a specific type of care.

Case types as defined in this study have not been used before and it will be important to ensure that appropriate training is provided to all staff making Case Type assignments. Staff need to know that they are classifying the patient and not the stream of care in which they work. Further, they need to know that patients are classified to a Case Type at the beginning of their care. Given that some patients could be assigned to more than one Case Type, it is critical that staff making Case Type assignments understand the algorithm. Of specific

importance is that Rehabilitation overrides both Geriatric Evaluation and Management and Maintenance Care.

A test of the inter-rater reliability of the definition of 'acute care' is yet to occur. A fundamental issue to be resolved is whether, for casemix purposes, the unique feature of acute care is actually the acuity of the patient or the presence of a clearly identified principal diagnosis that can be used to assign a patient to a 'diagnosis related group'.

Once this issue is resolved, it will be necessary to test the boundary between 'acute care' and the care reported in this study. It seems likely that the debate about the boundary of acute care will continue at least until such time as health care providers understand the definition of an episode of care.

## Acknowledgements

Thanks are due to the clinical staff who participated in the study as on-site coordinators and clinical raters.

## References

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## Appendix

### The five Case Types

#### Palliative Care

An episode of care:

- provided for a *person* with an active, progressive, far advanced disease with little or no prospect of cure and
- for whom the *primary treatment goal* is quality of life
- which is *evidenced by*:
  - + multidisciplinary assessment and/or management of the physical, psychological, emotional and spiritual needs of the person
  - + a grief and bereavement process for the person and their carers/family.

#### Inclusions:

- A palliative care provided in both community and hospital settings
- B grief and bereavement support services for the family and carers during the life of the person and continuing after death

#### Rehabilitation

An episode of care:

- provided for a *person* with an impairment, disability or handicap and
- for whom the *primary treatment goal* is improvement in functional status
- which is *evidenced by*:
  - + an individualised and documented initial and periodic assessment of functional ability by use of a recognised functional assessment measure
  - + an individualised multidisciplinary rehabilitation plan which includes negotiated rehabilitation goals and indicative time frames.

#### Inclusions:

- A Rehabilitation care provided in both community and hospital setting

## Psychogeriatric Care

An episode of care:

- provided for an elderly *person* with either an age-related organic brain impairment with significant behavioural disturbance or late onset psychiatric disturbance or a physical condition accompanied by severe psychiatric or behavioural disturbance and
- for whom the *primary treatment goal* is improvement in health, modification of symptoms and enhancement in function, behaviour or quality of life
- which is *evidenced by*:
  - + multidisciplinary assessment and/or management of complex medical, psychiatric and functional conditions and needs
  - + regular reassessments
  - + working towards negotiated goals within an indicative time frame.

### Inclusions:

- A psychogeriatric care provided in both community and hospital settings
- B psychogeriatric care of younger adults with clinical conditions generally associated with old age
- C psychogeriatric care of people with long-term psychiatric disturbance and/or substance abuse

## Geriatric Evaluation and Management

An episode of care:

- provided for a *person* with complex multi-dimensional medical problems associated with disabilities and psychosocial problems, usually (but not always) an older person and
- for whom the *primary treatment goal* is maximising health status and/or optimising living arrangements
- which is *evidenced by*:
  - + evaluation and formulation of a management plan for complex medical problems
  - + multidisciplinary assessment and management of functional and psychosocial needs
  - + regular assessments of current management plan working towards negotiated goals within indicative time frames.

### **Inclusions:**

- A geriatric evaluation and management provided in both community and hospital settings
- B evaluation and management of younger adults with clinical problems generally associated with old age

### **Maintenance Care**

An episode of care:

- provided for a *person* with a disability who, following assessment or treatment, does not require further complex assessment or stabilisation and
- for whom the *primary treatment goal* is the maintenance of function and current health status if possible
- which is *evidenced by*:
  - + the provision of health and treatment services and psychosocial support.

### **Types of maintenance care:**

- A maintenance care provided in both community and hospital settings
- B care and support of a person in an inpatient setting whilst the patient is awaiting transfer to residential care or alternate support services or where there are factors in the home environment (physical, social, psychological) which make discharge to home inappropriate for the person in the short term
- C ongoing care and support of a person in a residential setting
- D patients in receipt of care where the sole reason for admitting the person to hospital is that the care that is usually provided in another environment, eg, at home, in a nursing home, by a relative or with a guardian, is unavailable in the short-term
- E care and support of a person with a functional impairment for whom there is no multidisciplinary program aimed at improvement of functional capacity
- F patients classified as Nursing Home Type Patients, ie, when a patient has been in hospital for a continuous period exceeding 35 days and does not have a current acute care certificate