

ORIGINAL REPORT

EVALUATING INPATIENT PUBLIC REHABILITATION IN AUSTRALIA USING A UTILIZATION REVIEW TOOL DEVELOPED IN NORTH AMERICA

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Objective: To evaluate inpatient rehabilitation in public facilities in Australia against a utilization review tool used in the USA.

Design: Prospective cohort study.

Subjects: Patients identified in the acute wards of a regional referral hospital and subsequently transferred to a public inpatient rehabilitation facility.

Methods: The InterQual utilization review criteria were applied to days of stay in the rehabilitation wards. Reasons for variance and actual therapy time were recorded.

Results: Data on 267 patient episodes (7359 days) are available. Only 48% of patient days met utilization review criteria, with reasons for variance including insufficient therapy, awaiting discharge to long-term care or to home and being more appropriate for acute medical care. Therapy time data (available on 208 patient episodes) show that therapy was received on 50% of calendar days and for an average of 37 min per weekday (56 min for stroke patients). Allied health staffing levels were below recommended levels, but consistent with other Australian public hospital rehabilitation facilities.

Conclusion: Patients in these facilities seem to be receiving less therapy than their American counterparts; however, therapists often viewed their rehabilitation as appropriate. Findings also suggest inefficiencies in care delivery. Utilization review may help in the assessment of level of care appropriateness in the rehabilitation setting.

Key words: rehabilitation; inpatient; utilization review; therapy; intensity; efficiency.

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INTRODUCTION

Considerable effort has gone into redesigning healthcare in Australia over the past decade and more, with the focus being on acute care, access to emergency departments and chronic care (1, 2). Little attention has been paid to the role that rehabilitation has on access to acute care or the reduction in disability following illness or injury, and little emphasis has been

placed on ensuring that the process of public rehabilitation in Australia is as effective and efficient as possible (3).

Even though inpatient rehabilitation services in Australian public hospitals are widely available, especially within the states of New South Wales (NSW) and Victoria (3), and there is a national approach to the collection of rehabilitation outcome data (4), there are no standards to govern the amount of therapy patients should receive. While there are recommended staffing levels for inpatient rehabilitation services (5, 6), it is widely acknowledged within the public rehabilitation sector that these levels are often not achieved in practice and they do not take into account the non-clinical job demands placed on therapists, or the need for replacement during leave. Also, these recommended staffing levels are aimed at the unit level, and do not translate into an amount of therapy that individual patients should receive. This is in stark contrast to the situation that exists in the USA, where Federal regulation has mandated that patients in inpatient rehabilitation facilities should receive a minimum of 3 h of therapy per day for at least 5 days of the week (7).

Also, the staffing standards for rehabilitation facilities published by the Australian-based “Allied Health in Rehabilitation Consultative Committee” (6) do not include recommendations on the amount of a therapist’s time that should be devoted to actual face-to-face treatment. The Committee does suggest that “patient attributable” time should range from 20% of employed hours for an allied health manager, to 80% of employed hours for a grade 1 therapist, and somewhere in between for grades higher than grade 1¹. “Patient attributable” time includes activities such as time spent writing in the medical record, attending case and family conferences and ward rounds, travelling for home visits and writing reports, as well as time spent in face-to-face therapy.

Utilization review is the process of assessing the appropriateness of a patient, given their clinical condition and services actually received, for a specific level of care (reflective of the health system where the utilization review tool was developed). The InterQual Level of Care Criteria² is a utilization review tool commonly used in the USA, where it was developed and

¹Personal communication with Ms Wendy Hubbard, Chair of the Allied Health in Rehabilitation Consultative Committee, 5 February 2009.

²InterQual and CareEnhance are registered trademarks of McKesson Health Solutions LLC.

is used as an instrument of funders to justify payment. More recently it has been used in Canada and the UK, predominantly for the purpose of assessing inappropriate bed usage and to help facilitate care in the most appropriate setting (8). The InterQual Criteria are available for use in the acute care setting as well as in the rehabilitation and subacute settings.

Purpose of this study

Previous international studies using the InterQual Acute Adult Criteria have shown that a high proportion of patient days do not meet the criteria for acute care (9, 10). Similar results were demonstrated using the InterQual Criteria in acute care in Australia (11). However, there is no published work on the use of the InterQual Criteria in the rehabilitation or subacute settings, either internationally or within Australia. In this study the InterQual Level of Care Criteria (Rehabilitation and Subacute subset) is applied to a cohort of patients undergoing inpatient rehabilitation in public facilities in Australia, with the following aims:

- to contrast the care these patients receive against this utilization review tool;
- to examine reasons why utilization review criteria are not met, including the impact that the amount of therapy received has on the outcome of utilization review;
- to explore the utility of the InterQual tool in the rehabilitation setting in Australia.

The InterQual Level of Care Criteria in the rehabilitation and subacute settings

The InterQual Criteria were selected for use in this study because the research group had previously used the Adult Acute subset and found that they could be easily applied in the Australian setting (11). Furthermore, the InterQual Rehabilitation and Subacute subset provides a standardized means of evaluating rehabilitation and subacute care and the tool is used in the USA, potentially allowing insights to be gained into how public rehabilitation in Australia might contrast with practice in the USA.

A description of the InterQual Acute Adult and Rehabilitation and Subacute Level of Care Criteria can be found elsewhere (11). An important difference between the Acute Criteria and the Rehabilitation and Subacute Criteria is that the latter are more subjective, relying to a greater extent on the judgement of reviewers (for example, in determining how much therapy a particular patient needs and would benefit from) than on the objective measures (physiological and diagnostic findings and actual medical treatment received) found in the Acute Criteria. This is likely to have some impact on its application.

The InterQual Criteria contain algorithms to determine admission appropriateness, continuing stay appropriateness and discharge appropriateness, and for recommending the most appropriate alternate level of care. To meet appropriateness for admission to a rehabilitation or subacute level of care, patients must meet criteria within 5 categories:

- They must have had an illness, injury, surgery or exacerbation.

- They must have impairment(s) requiring at least minimal assistance.
- They must meet clinical stability criteria.
- They must be able to tolerate the rehabilitation programme or therapy.
- Treatment must be precluded at a lower level of care due to clinical complexity.

Within the InterQual 2006 Criteria there are 2 “levels” of rehabilitation (“Acute Rehabilitation” and “Subacute Rehabilitation”) and 3 levels of “subacute” care (“Skilled Nursing”, “Subacute Care” and “Complex Care”). It was decided that both of the rehabilitation levels of care as well as the “skilled nursing” and the “subacute (with therapy)” levels of care were applicable to the rehabilitation facilities in this study. Differences between these levels of care reflect the characteristics of the patient (including their impairment/diagnosis) and the characteristics of the facility. Some of the main differences are outlined below:

- Acute Rehabilitation – physician assessment/intervention is required at least 3 times per week; rehabilitation nursing is available 24 h per day; specialized rehabilitation equipment and therapy expertise is required; at least 2 therapy types are required; the patient has rehabilitation potential and is able to participate in the programme and can tolerate and needs to receive at least 3 h of therapy per day.
- Subacute Rehabilitation – skilled nursing services available daily; medical specialty consultative, pharmacy and diagnostic services are available; at least 2 therapy types are required; the patient has rehabilitation potential and is able to participate in the programme and can tolerate and needs to receive at least 2 h of therapy per day.
- Subacute Care – nursing of at least 4 h per day is required; the patient must have rehabilitation potential with the expectation of clinical/functional improvement and can tolerate and needs to receive 1–2 h of therapy per day.
- Skilled Nursing Care – nursing is required at least daily; the patient must have rehabilitation potential with the expectation of clinical/functional improvement and can tolerate and needs to receive less than 1 h of therapy per day.

In Australian public rehabilitation hospitals all 4 of these InterQual levels of care are likely to be deemed “rehabilitation”, as minimum therapy standards for rehabilitation do not exist.

METHODS

Utilization review, using the InterQual 2006 (Adult) Rehabilitation and Subacute Criteria³, was conducted on patients identified in a regional acute referral hospital as requiring rehabilitation and who were subsequently transferred to 1 of the study rehabilitation wards (3 general rehabilitation wards of 20, 21 and 23 beds, respectively, in 2 stand-

³A licence to use the InterQual product was purchased from McKesson (Australia). The licence arrangement included installation and training, local modifications to the software to allow customization of variance reasons and assistance with data extraction. However, McKesson has played no role in the analysis, interpretation or reporting of findings.

Table I. Age and gender for all patient episodes followed in the rehabilitation hospital between May 2007 and December 2007

Impairment group	Males		Females		Total	
	<i>n</i>	Mean age (range)	<i>n</i>	Mean age (range)	<i>n</i>	Mean age (range)
Stroke	24	73.6 (37.9–88.5)	21	79.2 (21.7–87.0)	45	72.9 (21.7–88.5)
Hip fracture	9	81.2 (76.3–84.2)	32	83.8 (73.7–96.5)	41	83.3 (73.7–96.5)
Joint replacement	8	76.3 (71.1–81.6)	12	75.0 (63.2–81.7)	20	75.5 (63.2–81.7)
Other rehabilitation	62	75.6 (26.0–95.0)	99	75.6 (18.1–95.5)	161	74.3 (18.1–95.5)

alone rehabilitation/subacute hospitals). Patients were grouped into those with stroke, hip fracture, joint replacement, or other impairments. Patients with amputation, acute traumatic spinal cord injury and severe traumatic brain injury were excluded from the study because patient numbers are typically too small for meaningful analysis.

Prior to applying the InterQual Criteria, clinical reviewers (experienced nurses, a physiotherapist and medical officers) were trained in their use by a trainer from the USA. The computerized version of the InterQual Criteria was used (CareEnhance Review Manager 5.0). Reviewers used the clinical record and discussion with treating staff in order to gain sufficient information to complete reviews. However, reviewers were not involved in treatment decisions and the reviews were not used to alter management. Likewise, the treating therapists were not involved in the utilization review assessments.

Once systems were in place for the recording of accurate therapy time data, treating therapists (physiotherapists, occupational therapists and speech pathologists) recorded the amount of time that they spent in therapy with individual patients. Therapy time included that provided by therapy aids and during home visits, but did not include “therapy” embedded in the care provided by rehabilitation nursing staff. Therapy time also did not include the collection of Functional Independence Measure (FIM)TM (12) assessments at the beginning and end of the episode, as the FIM was collected by nursing staff. Patients with complete therapy time data would be included in a subgroup analysis examining therapy time in more detail. However, sufficient information on therapy time was available on the entire cohort to allow completion of the utilization reviews.

The research was approved by the Human Research and Ethics Committee of the University of Wollongong.

Application of the InterQual Criteria

Patients were reviewed using the InterQual Criteria once or twice per week depending upon how stable their condition was. “Admission” reviews were applied on admission to the rehabilitation ward, and subsequent days of stay were followed with “continuing stay” reviews. Reviews spanned all days of stay in rehabilitation.

In terms of the medical and nursing support, therapist expertise and equipment available, all 3 rehabilitation wards would have met the requirements for the most intensive rehabilitation level of care (acute rehabilitation), so the facility itself was not a limiting factor in patients not meeting criteria for this level of care. Therefore, in determining which InterQual level of care (i.e. acute rehabilitation, subacute rehabilitation, subacute therapy, skilled nursing) the patient day was assessed against, reviewers looked at:

- patient factors (e.g. diagnosis and impairment, goals, patient’s motivation, number of therapy types required, ability to participate in the programme and tolerance of therapy);
- the appropriate amount of therapy for the patient (based on information provided by the treating therapists), and;
- the amount of therapy that patients actually received.

Reviewers deemed a day of stay as meeting the utilization review criteria if the patient factors and the amount of therapy (both that deemed appropriate and that received), met one of the InterQual rehabilitation or subacute levels of care. When criteria were not met, the reason, along with the most appropriate alternative level of care, was recorded. For example, if the patient factors and the amount of therapy deemed appropriate, met the “acute” rehabilitation level of care criteria, but the patient did not receive enough therapy for that category, then that day was classified as not meeting the criteria for “acute rehabilitation”, with the variance reason being “insufficient therapy time”. Where applicable, the most appropriate alternative care setting was also noted. If the reviewer was unsure how to record the day of stay, they referred the patient for a secondary review by another reviewer.

RESULTS

Reviewers reported that the InterQual tool was straightforward to apply. One full-time equivalent reviewer was able to cover all 64 rehabilitation beds in the study, resulting in a cost of approximately 5 Australian dollars per bed day, excluding product licensing costs.

Tables I–IV show results on the full cohort to which utilization review was applied (patients identified in the acute hospital and then admitted into 1 of the 3 rehabilitation wards between 4 May 2007 and 19 November 2007 (*n* = 267)). Tables V–VII show results on the subgroup for whom complete therapy time data are available (*n* = 208), which was between June and November 2007. An additional 13 patients (representing only 160 days of stay, or less than 2.5% of the 6428 days of stay included in the therapy time subgroup analysis) were excluded from the subgroup analysis as they had incomplete data. Table VIII compares the staffing levels in these wards with Australasian Faculty of Rehabilitation Medicine (AFRM) standards (5).

Table II. Overall patient days in the rehabilitation hospital meeting InterQual Criteria

Impairment group	No. of patient episodes	Days meeting criteria for a rehabilitation/subacute level of care <i>n</i> (%)	Days not meeting criteria <i>n</i> (%)	Total days in rehabilitation
Stroke	45	695 (46)	832 (54)	1527
Hip fracture	41	756 (58)	557 (42)	1313
Joint replacement	20	171 (52)	155 (48)	326
Other rehabilitation	161	1911 (46)	2282 (54)	4193
Total	267	3533 (48)	3826 (52)	7359

Table III. *InterQual categories for days meeting criteria for a rehabilitation/subacute level of care*

Impairment group	InterQual rehabilitation/subacute level of care				Grand total n (%)
	Acute rehabilitation n (%)	Subacute rehabilitation n (%)	Subacute care n (%)	Skilled nursing facility n (%)	
Stroke	38 (5)	115 (17)	314 (45)	228 (33)	695 (100)
Hip fracture	0 (0)	14 (2)	165 (22)	577 (76)	756 (100)
Joint replacement	0 (0)	2 (1)	99 (58)	70 (41)	171 (100)
Other rehabilitation	7 (0)	49 (3)	589 (31)	1266 (66)	1911 (100)
Total	45 (1)	180 (5)	1167 (33)	2141 (61)	3533 (100)

Patient characteristics

There were a total of 267 patient episodes followed in the 3 rehabilitation wards during the study period, representing a total of 7359 patient days. The age and gender of these patients are profiled in Table I. A total of 45 patient episodes were for stroke, 41 for hip fracture, 20 followed joint replacement and there were 161 episodes for other rehabilitation conditions (e.g. other disabling impairments and debility and other orthopaedic and neurological conditions).

Overall patient days meeting InterQual Criteria for rehabilitation care

Forty-eight percent of the 7359 days reviewed in the rehabilitation wards met InterQual Criteria for 1 of the 4 levels of care accepted in this study as representing "rehabilitation". These are days in which the patient was both clinically appropriate for one of the levels of care and received sufficient therapy for the level to which they had been classified. Table II outlines the number of days meeting and not meeting the Criteria, according to each diagnostic group. Hip fracture patients had the highest proportion of days meeting InterQual Criteria (58%), followed by joint replacement patients (52%) and stroke and other rehabilitation patients (both at 46%).

InterQual rehabilitation/subacute level of care for patient days meeting criteria

Of the 3533 patient days meeting InterQual criteria for a rehabilitation level of care, the majority only met the criteria for the equivalent therapy level of a Skilled Nursing Facility in the USA (i.e. less than 1 hour of therapy per day). Only 1% and 5%, respectively, of days met criteria for Acute and Subacute Rehabilitation, with the remaining 33% meeting criteria for a

level of care with between 1–2 h of therapy per day (Subacute Care) (Table III).

Reasons for InterQual Criteria not being met

When patients did not meet the InterQual Criteria for a rehabilitation/subacute level of care, the reviewer noted the reason. The principal reason is shown in Table IV for all episodes, as well as by episode type. Overall, insufficient therapy time was the most common reason that utilization review criteria were not met, accounting for 27% of all days not meeting criteria. This was followed by waiting for long-term placement (26%), being appropriate for discharge home (17%), and the patient being more appropriate for acute or subacute medical care than for rehabilitation (17%). Other reasons recorded, representing 13% in total, were the patient not being able to tolerate therapy on those days; the lack of an identifiable management plan and the patient remaining on trial discharge leave and not discharged.

There was some variation between diagnostic groups in reasons why criteria were not met. Insufficient therapy time was the most common reason in stroke and joint replacement patients (42% and 50% of days, respectively), while awaiting long-term care was the most common reason for hip fracture and other rehabilitation episodes (38% and 25%, respectively).

Days that therapy was received in the rehabilitation wards

Complete therapy data are available for 208 patient episodes. The mean length of stay (LOS) and days therapy was received for these patient episodes are presented in Table V. Overall, therapy of any nature or duration was received on only 50% of calendar days that patients were in the rehabilitation ward. No therapy occurred on weekends or public holidays.

Table IV. *Reasons why a rehabilitation/subacute level of care was not met (bed days)*

Main reason	Impairment group				
	Stroke n (%)	Hip fracture n (%)	Joint replacement n (%)	Other rehabilitation n (%)	All impairments n (%)
Insufficient therapy time provided	353 (42)	141 (25)	78 (50)	453 (20)	1025 (27)
Awaiting long-term care	188 (23)	209 (38)	17 (11)	564 (25)	978 (26)
Appropriate for discharge home	135 (16)	60 (11)	19 (12)	437 (19)	651 (17)
Requires acute or subacute medical care	84 (10)	55 (10)	18 (12)	505 (22)	662 (17)
Not able to tolerate therapy	32 (4)	67 (12)	8 (5)	127 (6)	234 (6)
Unclear management plan	31 (4)	17 (3)	5 (3)	159 (7)	212 (6)
Patient remaining on trial discharge leave	7 (1)	6 (1)	9 (6)	29 (1)	51 (1)
Missing data	2 (0)	2 (0)	1 (1)	8 (0)	13 (0)
Total	832 (100)	557 (100)	155 (100)	2282 (100)	3826 (100)

Table V. Summary of patient length of stay (LOS) (days) and number of days that therapy was received

Impairment group	Mean LOS*, days (range)	Mean number of calendar days per admission that therapy was received, n (%)
Stroke (n=34)	31.6 (2-82)	17.3 (54.7)
Hip fracture (n=35)	33.1 (4-135)	18.5 (55.9)
Joint replacement (n=16)	15.8 (2-39)	7.9 (50)
Other rehabilitation (n=123)	29.5 (2-110)	13.9 (47.1)
Total (n=208)	29.4 (2-135)	14.7 (50.0)

*Length of stay includes the day of admission and the day of discharge.

Amount of therapy actually received during weekdays

The mean amount of therapy received per weekday is presented in Table VI and is broken down by diagnostic group and therapy type. On average, patients received only 37 min of therapy per weekday, with stroke patients receiving considerably more (mean of 56 min per weekday).

Table VII shows the same data as presented in Table VI, but only for those patient days that were deemed clinically appropriate for a rehabilitation/subacute level of care, regardless of the level of therapy actually received. By excluding patient days that did not meet appropriateness due to other reasons (see Table IV, above), the amount of therapy received per weekday rose to a mean of 48 min per day (69 min for stroke).

Comparison of allied health staffing to recommended levels

The actual numbers of allied health staff available for these 3 rehabilitation wards for the study period is shown in Table VIII, along with the AFRM staffing standards (5). Also shown are estimations of the amount of available “patient attributable” time in the study wards (actual vs those based on AFRM recommended staffing levels) and a calculation of the percentage of actual therapy patients received against the calculated available “patient attributable” therapy time. Note that these calculations should only be viewed as a guide and are based on a number of assumptions⁴.

Table VI. Therapy received per weekday for all patients with therapy data available, by type and total therapy

Impairment group	Mean PT per weekday (min)	Mean OT per weekday (min)	Mean speech therapy per weekday (min)	Mean total therapy per weekday (min)
Stroke	38	10	9	56
Hip fracture	29	6	0	35
Joint Replacement	27	8	0	35
Other rehabilitation	25	6	2	32
Total	28	7	3	37

PT: physiotherapy; OT: occupational therapy.

⁴Assumption are that therapists worked a full 38 h per week with no leave taken during the study period, that 75% of their time was available for patient attributable duties and that the patients followed in this study were representative of all patients in the ward.

Table VII. Therapy received per weekday for patient days deemed clinically appropriate for a rehabilitation level of care regardless of the level of therapy actually received, by type and total therapy

Impairment group	Mean PT per weekday (min)	Mean OT per weekday (min)	Mean speech therapy per weekday (min)	Mean total therapy per weekday (min)
Stroke	48	11	10	69
Hip fracture	32	7	0	40
Joint replacement	32	8	0	41
Other rehabilitation	33	9	2	44
Total	36	9	3	48

PT: physiotherapy; OT: occupational therapy.

The results show that these wards are staffed at levels below the AFRM recommendations and that patients received considerably less actual therapy than that calculated as available “patient attributable” time. This is particularly the case for occupational therapy, where patients received only approximately 24% of the estimated available “patient attributable” time in face-to-face therapy. Anecdotally, occupational therapists report that they are required to spend considerable time writing reports from assessments and home visits and ordering home modifications and equipment.

DISCUSSION

The major study findings are that, when tested against an inpatient utilization review tool used in the USA, only 48% of bed days in these Australian public rehabilitation wards met the tool’s rehabilitation/subacute criteria. The vast majority (94%) of days that did meet the criteria did so only at the “subacute” or “skilled nursing” level of care. While the main reason why utilization review criteria were not met was insufficient therapy time (27%), there were a number of other reasons, such as awaiting long-term care (26%), being appropriate for discharge home (17%) and being more appropriate for a medical level of care (17%).

Patients received therapy on only 50% of admitted days and, on average, only 37 min of therapy was received per weekday. This rises to an average of 48 min per weekday, when all bed days that did not meet utilization criteria (except for “insufficient therapy”) are excluded. The figures for stroke are higher (56 and 69 min per weekday, respectively). No therapy at all was received on weekends or public holidays.

The InterQual tool was chosen because of its structured approach to measuring hospital utilization and its potential to provide insights into how public rehabilitation in Australia might contrast with rehabilitation practice in the USA. While the InterQual Criteria may be viewed as reflective of rehabilitation practice in the USA, they are not necessarily generalizable to all rehabilitation/subacute practice in the USA. Indeed, the American Academy of Physical Medicine and Rehabilitation (AAPM&R) notes that there is lack of agreement between criteria such as InterQual and prevailing clinical practice. (7) Nevertheless, the characteristics of rehabilitation patients and rehabilitation hospitals/units described by the AAPM&R

Table VIII. Comparison of actual staffing to Australasian Faculty of Rehabilitation Medicine (AFRM) standards for the study wards and calculations of actual face-to-face therapy vs available therapist time

Therapy type	FTE positions available per 10 beds in the study wards	Estimated AFRM standard therapy staffing per 10 beds for the study wards FTE (range)†	Maximum actual "patient attributable" therapy time available per patient per weekday in study wards min#	Estimated maximum amount of patient attributable therapy time per patient per weekday based on AFRM staffing min#	Actual face-to-face therapy time achieved in study wards min	Percentage of estimated available "patient attributable" time recorded as actual face-to-face therapy %
Physiotherapy	1.14	1.3 (1.25–1.5)‡	41	47	28	68
Occupational therapy	0.81	1.0 (0.8–1.5)§	29	36	7	24
Speech therapy	0.17	0.35 (0–1.5)¶	6	13	3	48

†Depends on impairment group.

‡Ranges from 1.25 for "debility" and "orthopaedic" to 1.5 for "neurology".

§Ranges from 0.8 for "orthopaedic", 1.0 for "debility" to 1.5 for "neurology".

¶Ranges 0 for "orthopaedic", 0.2 for "debility" to 1.5 for "neurology".

#Assumes a 38 hour week, full leave relief and based on 75% patient attributable time.

FTE: Full-time equivalent.

are similar to those contained in the InterQual Criteria for the "Acute Rehabilitation" level of care.

The fact that only 6% of patient days in this study met the InterQual acute or subacute rehabilitation criteria (characterized by 3 or more, or 2 or more, hours of therapy per day, respectively), suggests that patients in these Australian public hospital rehabilitation facilities receive considerably less therapy than their counterparts in the USA, in terms of the amount of therapy received per day and the number of days per week that therapy is received. This is despite the fact that, in other respects, these Australian facilities, with the range of equipment, therapist expertise and rehabilitation medical and nursing support available, meet utilization review criteria for the acute rehabilitation level of care.

Two aspects of these findings warrant discussion. The first is the issue of why such a high proportion of bed days with low levels of therapy were still deemed to have met utilization review criteria, and the second is the impact of these low therapy levels on the outcomes of rehabilitation.

The decision about how much therapy a particular patient needs and can tolerate is, to some extent, subjective and open to the interpretation of the reviewer and treating therapists. The InterQual criteria provide some guidance, by linking specific diagnostic categories and impairments with certain levels of rehabilitation care, and by asking questions about the patient's cognitive and physical abilities and need for various therapy types. However, the way that a reviewer responds to these questions is likely to be influenced by their prior experiences and training. While trained in the use of the tool itself, reviewers had not worked in the USA or been exposed to rehabilitation environments with higher expectations placed on facilities for the provision of therapy, or on patients for participation in rehabilitation programmes (7, 13). Reviewers and treating therapists may have regarded the therapy levels available as the accepted norm, and therefore appropriate. Further work examining therapists' reasoning behind their decision-making about patient requirements for, or ability to tolerate, therapy is required.

It is also possible that patients in this study were different to those in rehabilitation facilities in the USA, with patients in the present study being less in need of, and/or less tolerant of, therapy. However, against this argument is the fact that the 3 rehabilitation wards in the study serve a defined catchment population, with very little outflow to rehabilitation facilities outside of the catchment. While there is some private inpatient rehabilitation capacity in the area, the private beds represent only approximately 25% of the area's total inpatient rehabilitation bed capacity, and access to private rehabilitation is limited to those who hold private health insurance.

While there is a growing body of research that suggests that increasing the intensity of therapy achieves better rehabilitation outcomes, this is predominantly available for stroke and other neurological impairments (14–22). However, Chen et al. (23) found that functional gains in all of the 3 impairment groups of stroke, orthopaedics and debility were weakly, although significantly, related to therapy intensity. High-quality evidence relating therapy intensity to outcome is not available for many of the impairments that patients receive rehabilitation for, and further research into the types of therapy most efficacious, as well as the intensity of therapy (both the duration of therapy and the amount of effort required of the patient), is required (24, 25).

Even though not receiving sufficient therapy represented the main reason that utilization review criteria were not met, this reason only accounted for 27% of the bed days that criteria were not met. The fact that delays in discharging patients to alternative care settings (either to long-term care or to home) accounted for 43% of these bed days suggests that efficiencies could be gained if these delays could be overcome. Reasons for these delays were not explored in this study, but are likely to have included: delays in the approval process for, and access to, long-term care; delays in obtaining home modifications and discharge equipment, and; delays by the team and patient/family in determining readiness for discharge. Even though representing only 6% of the bed days that utilization review criteria were not met, the reviewer's determination that there

was insufficient evidence of a clear management plan to satisfy review criteria, warrants further investigation. In the Australian context this finding might reflect the fact that the health system is not attuned to having to ensure that documentation meets the requirements of an external utilization review process.

The finding that 17% of bed days did not meet criteria due to the patient being more appropriate for acute or subacute medical care suggests that this is a group of patients whose medical status fluctuates. Interestingly, the rate was lower in stroke, hip fracture and joint replacement patients (10%, 10% and 12%, respectively) than in the "other rehabilitation" group (22%), with the latter consisting of more patients with multiple morbidities and debility and likely to be medically less stable. This finding has implications for the public rehabilitation sector in Australia, as this patient group is becoming more prevalent in the public units. Growth in the private rehabilitation hospital sector in the past decade in Australia has allowed private facilities to target the less medically complex patients, resulting in proportionately more patients with multiple morbidities and general debility being managed in public hospital rehabilitation units (3). Standalone rehabilitation facilities (as were the study wards) will often be called upon to manage medically unstable patients, and this has implications for the resources they require, their relationship with acute medical facilities and their ability to accept patients who may become medically unstable.

Further work on how much of a therapist's time should be devoted to actual patient therapy (and not just the broader concept of "patient attributable" time) is also required. Allied health professionals are a limited resource in Australia and models of care that make the most efficient use of this resource are required, such as exploring the role of therapy aids or providing allied health staff with administrative support, thereby freeing up their time for therapy. Even at the recommended AFRM staffing levels, the amount of therapy available in these wards would fall well short of that provided in acute and subacute rehabilitation facilities in the USA. A better way of determining allied health staffing may be to base it on the therapy requirements for individual patients, rather than at the unit level.

As for the utility of the InterQual tool, it was found to be easy to apply and offered a structured way of assessing rehabilitation care. Excluding licensing costs, the tool was not found to be prohibitively expensive, with a labour cost in the order of 5 Australian dollars per day to apply. The largely subjective nature of certain of the criteria in the InterQual Rehabilitation and Subacute subset, such as the patient's requirement for and ability to tolerate therapy, needs to be further defined if the tool is to be used to assist in "prescribing" therapy intensity for individual patients and selecting patients for care settings (e.g. fully staffed and equipped rehabilitation wards vs other subacute facilities). However, even in its present form the InterQual tool may provide a useful means to help identify when the key elements of a rehabilitation programme are not being met, thereby allowing an opportunity for action by the treating team. It could also provide a structure for benchmarking and service planning, and it may have a role in helping to

identify patients in an acute care setting who would benefit from rehabilitation, in determining the timing of transfer to rehabilitation and in flagging when a move to an alternative care setting, or discharge home, is appropriate (8, 11). However, to test its utility in these domains would require a prospective study where the InterQual tool was used as an aid to facilitating care.

While having a number of limitations, this study does provide useful information about the nature of public rehabilitation in Australia and, through the use of a utilization review tool developed in the USA, offers some insights into how Australian rehabilitation practice might contrast to that in the USA. However, direct comparisons between rehabilitation outcomes in Australia and the USA are not readily possible due to a lack of recently published aggregate American data. The study findings are likely to be broadly generalizable to other Australian public rehabilitation facilities, as the study wards were catchment-based and the allied health staffing levels in these wards, even though less than those recommended by the AFRM, were consistent with staffing levels in similar public units.

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