

Defining the appropriate use of community hospital beds

I P Donald, Trish Jay, J Linsell and Chris Foy

SUMMARY

Background: Patients of GPs who have access to community hospitals (CHs) as well as district general hospitals (DGHs) tend to spend on average more days in hospital each year. Increasing attention is being paid to the efficient management of medical admissions; however, there has been no previous prospective study investigating the appropriateness of CH admissions.

Aim: To develop a protocol to assess the clinical appropriateness of admission and length of stay of patients in CHs and to simultaneously compare the appropriateness of admissions to all DGHs and CHs in the county.

Design of study: A protocol named Community Hospital Appropriateness Evaluation Protocol (CHAEP) was developed to assess CH admissions through a process of consultation and a series of pilot studies. The appropriateness evaluation protocol (AEP) was also reviewed and used to assess DGH admissions.

Setting: A prospective cohort of 440 DGH admissions from five DGH sites and 440 CH admissions from nine CHs.

Methods: The admissions were assessed and followed for 28 days. If an admission failed to satisfy any of the criteria then the researcher interviewed the clinician to decide whether it was justified to override the protocol and still classify the admission as appropriate. To assess validity, a proportion of these 'clinical overrides' and the researcher's classifications were reviewed retrospectively by a clinical panel. The kappa statistic was used to assess the level of agreement.

Results: Applying the CHAEP, 82% of CH admissions satisfied a criterion for admission and a further 3% were given clinical overrides. A lower intensity of care was required for the majority of the remainder while three admissions required DGH care according to AEP criteria. Sixty-eight per cent of bed days satisfied day-of-care criteria within CHAEP and only a further 2% were given clinical override. These results were similar to those found with the AEP at the DGHs where 75% of admissions (plus 16% given clinical override) and 55% of days-of-care (plus 20% given clinical override) satisfied the AEP criteria. The review panel generally did not agree with the clinician's use of the clinical override at the CHs. Agreement between research nurse and review panel was better for the AEP and DGH ($\kappa = 0.9$, 95% confidence interval (CI) = 0.7–1.0) than for the CHAEP and CH ($\kappa = 0.37$, 95% CI = 0.1–0.8).

Conclusions: The CHAEP could be used to audit the appropriateness of admission and length of stay in CHs. Other health communities would need to review the CHAEP before it could be applied within their context.

Key words: community hospitals; district general hospitals; emergency admissions; bed management

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Introduction

IN 1990, there were believed to be 350 community hospitals (CHs) in England and Wales¹ with an estimated 3% of the NHS bed complement.² In 1997, a literature review found no studies that assessed the appropriateness of CH admissions and bed use³ and this remains the case. Tools have been developed to assess the appropriateness of admission and bed use in medical beds in district general hospitals (DGHs), including the Appropriateness Evaluation Protocol (AEP)⁴ and the Intensity-Severity-Discharge Review System (ISD-A).⁵ These have been evaluated in the United Kingdom, Europe and the United States of America. One difficulty is that CHs are recognised as offering diverse service provision depending upon the requirements of the local communities they serve.⁶

Any resource within the NHS should be used wisely — it would be inefficient to care for patients in a CH who could be safely managed at home and unwise to care for patients who would have been better if more appropriately managed in the DGH. Descriptive studies have often suggested that CHs provide an important resource that can reduce pressure on acute medical beds.^{7–10} For instance, one general practice in mid-Wales¹¹ found that 78% of all medical admissions were managed in their CH. A study from Bath¹² found that practices with access to a CH had lower DGH admission rates but higher combined CH plus DGH admission rates. A similar scenario prevails in Gloucestershire.¹³ Until now there were no validated tools to measure the appropriateness of the CH admissions. Without such a tool it is difficult to comment on the function being performed by the CH.

Principal characteristics of the CH include the absence of both resident medical staff and on-site laboratories. Community hospitals are able to provide appropriate care to certain groups of patients; for example, those with minor acute illness who nevertheless require admission for other reasons, perhaps because of pre-existing disability; those recovering from an acute episode at the DGH; and those requiring rehabilitation or terminal care. An observational study from Leicestershire¹⁰ found the case-mix of admissions to CHs included 35% for acute care, 31% for respite care, 22% for rehabilitation, and 7% for palliative care. It was recognised that there were considerable differences between Gloucestershire's CHs both in terms of facilities and case-mix; however, it would be desirable to reach a consensus in describing appropriate use. The goal was to develop a set of criteria for the definition of appropriate admissions and appropriate days-of-care within a CH. A prospective audit would then measure how frequently the criteria were met and validate these assessments by clinical retrospective review.

The AEP^{14,15} and the ISD-A¹⁶ have prospectively examined DGH admissions and measured the perceived potential for

HOW THIS FITS IN*What do we know?*

Tools of appropriateness for the district general hospital have shown that many patients could be cared for in a lower intensity setting; no similar tool has been developed for the community hospital.

*What does this paper add?*

A tool to define the appropriateness of admission and days-of-care in community hospitals has been developed, accepted by the local health community, and validated. Eighteen per cent of community hospital admissions and 30% of days-of-care did not satisfy any of the agreed agenda.

treating a proportion of patients in lower intensity alternatives to the acute hospital. The AEP was selected because it appears to be the more stable. It was used to define the proportion of patients admitted to the DGH who might be more appropriately cared for in the CH, to enable comparison with these previous studies. The new CH protocol could then define whether such patients satisfied the criteria for admission to a CH instead.

Method

A steering group was formed with wide membership from the health authority, managers, social services, physicians, and senior nurses from three Trusts, and general practitioners (GPs) representing each of the five locality commissioning areas at the time. Research design was assisted by members of the Research and Development Support Unit of Gloucestershire Health Authority.

Development of the Community Hospital Appropriateness Evaluation Protocol (CHAEP)

This began with a putative amendment to the original AEP categories with the addition of new categories to describe the specific roles of the CH, such as rehabilitation and terminal care. This was discussed and modified by the steering group before the first of four pilot studies to test the criteria. It was decided that the most pragmatic way of designing a new tool was by frequent testing and reflection on the results. The wording of a criterion would be constantly reviewed to enable it to capture only those admissions that the steering group all agreed were appropriate.

The aim throughout was to develop the minimum number of criteria that would justify almost all appropriate admissions and appropriate days of care. We followed the procedure used by the AEP in incorporating the use of 'clinical override' in classifying cases who were judged appropriate, yet failed to satisfy one of the criteria. The research nurse would then ask the responsible clinician if they believed that, nevertheless, the care was appropriate and the protocol should be suitably overridden. The intention was to minimise the use and need for such overrides to improve the simplicity and reliability of the protocol.

Again, similar to the original AEP, we included a set of departure criteria that asked the responsible clinician to explain why an admission or a day-of-care had been provided

ed in the CH, even though no criterion had been met. This was used when the clinician accepted that the admission departed from the agreed criteria.

The steering group also reviewed the existing AEP criteria in line with previously published recommendations that such a review should be conducted locally before the AEP is used.¹⁴ The group made only two changes to the admission criteria: the presence of an intravenous infusion was removed and a severe pain criterion was added.

Over a period of six months, 96 admissions and 97 days of care were assessed during the development phase in four pilot studies in five out of the nine CHs. As the CHAEP approached its final version it was circulated to all GPs in the county, all medical staff committees, and to other multidisciplinary teams to address any further concerns.

The AEP and CHAEP tools

The modified version of the AEP retained 14 criteria for admission. In the CHAEP, nine admission criteria to a CH were retained in the final version (Box 1). They included 'an acute illness not requiring DGH care yet requiring nursing assessment', 'a rehabilitation programme', 'terminal care', 'blood transfusion', and 'acute confusion with a provisional diagnosis'. Respite care was included but needed to satisfy one of three conditions: a need for review of care needs; a Barthel disability score¹⁷ of less than 5 (scale range = 0–20); or respite in an emergency because of carer problems.

The AEP has 21 criteria for a day-of-care at the DGH and this was not modified by the steering group. The CHAEP also included 21 criteria; 10 of these were taken directly from the AEP and a further three adapted to the CH setting (Box 2). Eight additional criteria included bowel or bladder management at least three times a day, terminal care, rehabilitation plan, respite care (as previously defined), and regular supervision at night.

Evaluation of the CHAEP in a prospective audit

A sample of all medical admissions to DGHs and CHs were assessed by a team of research nurses. They were trained carefully by one of the authors (TJ) in the use of the AEP and CHAEP through theoretical as well as practical application in various clinical settings. The project lead reviewed each nurse and all the completed data collection forms during training and the audit. It was decided to use both the AEP and CHAEP to assess admission criteria in both DGH and CH settings. Each patient included in the study was assessed by the research nurse within 72 hours of their admission and within 24 hours on weekday admissions. The assessment was made by reviewing all clinical notes and discussion with a ward nurse. Days-of-care were assessed by further regular visits until the day of discharge up to a maximum of 28 days. Days-of-care in the DGH were assessed by the AEP and days in the CH by the CHAEP. At the DGH, if the day-of-care did not satisfy the AEP, the CHAEP day-of-care criteria were also applied. Patients transferred from DGH to CH remained in the study for the appropriateness of their days-of-care; however, a new admission was not counted.

Selection of the sample

The sample was drawn from both DGHs and from all nine CHs. A sample size of 880 enabled determination of the rate of inappropriateness at a presumed rate of 20% with 95% confidence intervals of 17–23%. Such a sample size represented 5% of all emergency medical admissions in a year. Half of the sample was drawn from DGH admissions and half from the CH. The study ran for six weeks in September/October 1998 and a further six weeks in January/February 1999 in case seasonal factors influenced the appropriateness of admissions. For each time frame, 220 DGH admissions and 220 CH admissions were sought and a target sample number was set for each hospital reflecting the number of beds at that site. To reach these targets, all consecutive admissions at each CH site were included until the target was reached; at the DGH, every sixth patient admitted was included. When the target number for a hospital was reached, no further admissions to that hospital were included.

Validation of assessments

A retrospective review of the override facility was conducted by members of the steering group to establish the validity of its use in the different settings. One-third of cases where a clinician had used the override facility were selected and reviewed. Validation of the research nurses' use of the AEP and CHAEP was performed again by members of the steering group retrospectively reviewing a sample of case notes. In both cases, the review panel would reach a consensus on their opinion of whether an admission or day-of-care satisfied criteria within the AEP or CHAEP or, alternatively, whether they could agree with the clinician's use of the override. Agreement between research nurse and review panel was assessed using the kappa statistic.

Results

In 1997, there were nine CHs in Gloucestershire with 283 beds, comprising 32.5% of designated medical beds. That year there were 3862 medical admissions to the CHs and 17 482 medical admissions to the five DGH sites (three of these are satellite acute units).

The prospective audit assessed 440 DGH admissions and 440 CH admissions during the same two time frames. No difference was found in the results from the two time frames. At the DGHs, 330 (75%) admissions satisfied at least one criterion within the AEP and a further 69 (16%) were given an override to appropriateness by their responsible clinician. These were predominantly associated with admissions to specialist medical units or designated rehabilitation units situated within the DGH. Of the remaining 41 admissions judged inappropriate by the AEP, 33 (7.5% of all DGH admissions) justified admission to the CH by the CHAEP criteria (Table 1).

At the CH, 360 (82%) admissions satisfied a criterion within the CHAEP of whom 36 also satisfied one of the AEP criteria. The use of the nine criteria for admission is shown in Table 2. Three admissions met AEP but not CHAEP criteria, indicating that their illness was of a severity more appropriate for the DGH. Only 12 admissions (3%) were given an

override to appropriateness by their clinician. The remaining 15% of CH admissions were judged inappropriate. In six cases no clear plan for the admission was identified and in 49 cases care at a lower level of intensity was required (Table 1).

In total, 9546 bed days were assessed (3595 in acute hospitals and 5951 in community hospitals). One hundred and nineteen patients (13.5%) remained in hospital beyond the 28-day tracking period (48 in acute hospitals and 71 in community hospitals). At the acute hospitals, 55% of bed days satisfied day-of-care criteria within AEP, and a further 20% were given clinical override, leaving 25% judged inappropriate. At the community hospitals, 68% of bed days satisfied day-of-care criteria within CHAEP and only a further 2% were given clinical override. The reasons for departure within each setting are shown in Table 3. Because patients were tracked for only 28 days and inappropriateness was more prevalent at the end of longer hospital stays, these figures are over-estimates of the true appropriateness percentages.

As might be expected, at both the DGHs and CHs days-of-care were more likely to be rated as inappropriate as the stay progressed (Figure 1). At the CHs this rose from 21% of

One or more criteria met:

1. Acute condition (onset less than one week provision). Not requiring DGH care, but requiring medical (non-resident) and nursing assessment/investigations.
2. Recent recovery from major surgery (less than one week postoperative).
3. Rehabilitation programme to recover functioning.
4. Critical deterioration in functioning (in context of chronic illness). Sufficient care thought to be available in community hospital to ascertain cause and provide treatment.
5. Terminal care.
6. Acute confusion (for less than 48 hours and with provisional physical diagnosis).
7. Requiring a plan of several inpatient investigations.
8. Blood transfusion.
9. Medical respite care: patient's needs include: review/assessment; disability with Barthel <5; emergency carer respite.

Departure from the criteria

No community hospital admission criterion met: reason assigned for departure:

1. Patient needs 24 hour care, but at a lower level than a community hospital.

Patient has been admitted for diagnostic procedure or treatment that could have been done on an outpatient basis:

2. No identified reason for not performing tests as an outpatient.
3. Patient lives too far away from hospital to accomplish procedure expeditiously.
4. Procedure could not be scheduled expeditiously.
5. Patient non-compliance with necessary outpatient therapeutic regime.
6. Premature admission — a day or more before procedure scheduled.
7. No documented plan for diagnostic procedure and/or treatment.
8. Actual or suspected elder abuse; patient admitted for protective custody.
9. Patient needs DGH care with 24 hours on-site medical staff, or access to diagnostic equipment not available in a community hospital.
10. Other.

Box 1. Community hospital admission criteria.

One or more criteria may be met for agreement

1. Any invasive procedure that day which could not have been done as a day case.
2. New/change in treatment under medical supervision, requiring 24-hour nursing observation.^a
3. Parenteral therapy — intermittent or continuous IV fluids.^a
4. Vital sign monitoring at least four times a day.
5. IM or SC injections more than twice a day.^a
6. Fluid balance or daily weighing.^a
7. Major surgical wound care three times a day.^a
8. Close nurse monitoring more than three times a day.^a
9. Wound management requiring 24-hour nursing supervision.^a
10. General supervision required at least four times a night.
11. Bowel management plan with nursing input more than three times a day.
12. Bladder management plan with nursing input more than three times a day.
13. Blood transfusion.
14. Fever of at least 38°C within past 48 hours.^a
15. Coma/unresponsiveness in past 24 hours.^a
16. Acute confusional state for less than 48 hours with provisional diagnosis and treatment plan.^a
17. Terminal care.
18. Recent recovery from major surgery.
19. New acute illness — onset within 24 hours, not requiring DGH care but requiring non-resident medical care and nursing assessment.
20. Rehabilitation plan.
21. Medical respite care.

^aCriterion also appears in the AEP tool.

Departure from the criteria

No community hospital day-of-care criteria met — reason assigned for departure:

1. Patient needs 24-hour care but at a lower level of care than a community hospital.
2. Problem in scheduling procedure.
3. A scheduled procedure was delayed.
4. Down days at the hospital (e.g. certain procedures not performed at weekend).
5. Waiting for results of tests/procedures.
6. Diagnostic procedure could be done as an outpatient.
7. Waiting for medical agreement for discharge.
8. Family/regular carers causing delay in discharge.
9. Organisation of services outside of hospital delaying discharge.
10. Other.

Box 2. Community hospital day-of-care criteria.

the first days of care rated inappropriate to 41% of days by the 28th day; at the DGHs, the prevalence increased from 19% to a peak of 31% by the 10th day, remaining at this level for longer admissions.

The use of the override facility for admission criteria and day-of-care criteria was reviewed in a sample of cases but at the CHs the override had been used in too few instances to enable a meaningful assessment of the validity of its use. However, in general the review panel did not agree with the opinion of the GP in using the override facility.

The research nurses' use of the AEP and CHAEP tools was assessed by a retrospective review of 42 acute hospital admissions and 46 community hospital admissions. In the acute hospitals, there was agreement between the research nurse and the review panel in 98% of admissions and 80% of days-of-care ($\kappa = 0.90$, 95% CI = 0.7–1.0, and $\kappa = 0.43$, 95% CI = 0.08–0.78 respectively). There was a lower level of agreement for the community hospitals with agreement in 85% of admissions reviewed and only 78% of days-of-care reviewed, giving kappa values of 0.37 (95% CI = 0.1–0.80) and 0.29 (95% CI = 0.1–0.72) respectively. No consistent direction of disagreement was observed.

Discussion

The CHAEP is a set of criteria developed by consensus and accepted by GPs, medical staff committees, and multidisciplinary teams as criteria for defining appropriate admissions and days-of-care within CHs in Gloucestershire. This itself was an important local achievement. During the prospective audit it was found that 82% of CH admissions satisfied one of the agreed criteria and the admitting GP accepted that an alternative to admission would have been appropriate for 15% of admissions had such an alternative been readily available. The GPs opted to use the clinical override within CHAEP for only 3% of admissions. However, the clinical override facility appeared unreliable; it failed to improve the function of the tool and we believe it may well be superfluous. This meant that the criteria agreed when the CHAEP was created proved robust in defining the appropriate need for a CH admission in practice as virtually all appropriate admissions were captured by the criteria.

The greater overall bed use in areas where GPs have access to CHs^{12,13} has raised the concern that some of this bed use is inappropriate. The use of the CHAEP has suggested that 15% of all CH admissions might be avoidable which is a rather more modest figure than some managers might have believed. Alternatives to admission to a CH are

Table 1. Reasons for failing to satisfy any admission criteria.

Reason	Acute hospitals		Community hospitals	
	<i>n</i>	%	<i>n</i>	%
Overall admissions assessed	440	100	440	100
Admissions satisfying criteria	330	75	360	82
No criteria, overridden by clinician	69	16	12	3
Needs 24 hr care at lower level than current setting	33	7.5	49	11
Premature admission	1	0.2	1	0.2
No documented plan	2	0.4	6	1.4
Protective admission	5	1	0	0
Needs DGH care	—	—	3	0.6
Other	0	0	9	2

Table 2. Principal criterion of the CHAEP satisfied by admissions to a community hospital (n = 440).

Admission criterion	n	%
Acute condition, not requiring DGH care	109	25
Acute confusion plus provisional diagnosis	3	0.7
Blood transfusion	11	2.5
Critical deterioration in context of chronic illness	64	14.3
Recovery from recent major surgery	14	3
Rehabilitation programme	108	25
Terminal care	18	4
Requiring a series of investigations	10	2.5
Medical respite care	23	5
Total where an admission criterion was satisfied	360	82%
No criterion satisfied	80	18%

Table 3. Reasons for failing to satisfy day-of-care criteria.

Reason	Acute hospitals		Community hospitals	
	n	%	n	%
Overall days-of-care assessed	3595	100	5951	100
Days satisfying criteria	1972	55	4041	68
Days where criteria were overridden by clinician	717	20	118	2
Needs 24-hour care at lower level than current setting	410	11.4	607	10.2
Procedure scheduling, or waiting for test result	84	2.3	66	1.1
Waiting for doctor to confirm discharge	200	5.6	197	3.3
Family/regular carers delaying discharge	21	0.6	125	2.1
Organisation of services	144	4	712	12
Other	44	1.1	85	1.3

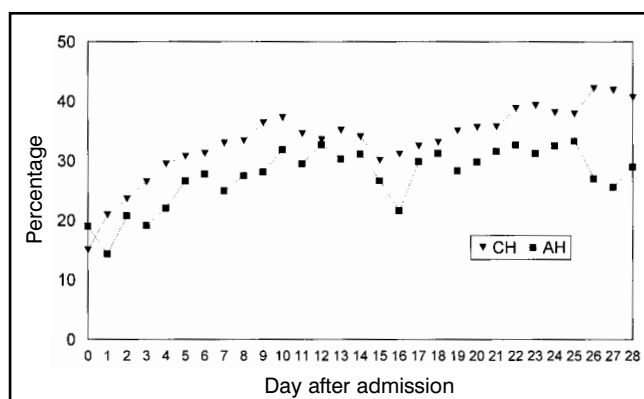


Figure 1. Occurrence of inappropriate days of care at community hospitals and acute hospitals related to the number of days after admission.

likely to include access to immediate homecare services, community rehabilitation, and respite admissions into residential care. All these alternatives are currently being developed in Gloucestershire and indeed in many parts of the UK. Periodic use of the AEP and CHAEP would enable monitoring of the effect of the introduction of such services upon the rate of inappropriate admissions.

The concurrent use of the AEP and CHAEP in the acute hospitals identified patients whose illness may have been more appropriately managed in a lower level of care, such as a community hospital setting. Such patients comprised 7.5% of the DGH admissions. Interestingly, a previous study,¹⁵ based predominantly on retrospective review by an independent GP panel, made estimates of between 5.6 and 8.4% of DGH admissions that could have been managed

more appropriately in a CH setting. In our study, a proportion of these patients lived in areas without local community hospitals and for them such a CH admission would add inconvenience. Skilful bed management would be required if the capacity at CHs is to be filled with patients who otherwise would be admitted to the DGH.

The reliability of the CHAEP in defining appropriateness appeared less satisfactory than the more established AEP. One explanation for this finding was that the quality of medical notes was generally less detailed in the CH than the DGH. This led to great difficulties for the review panel conducting a retrospective review of the notes and disagreement between the panel and research nurses was not surprising. We believe the more accurate view of appropriateness was formed by the research nurse during the admission when verbal comments from ward nurses could be added to the written evidence.

The application of the CHAEP tool in another health district would require local discussion. Primary Care Groups and hospital medical staff committees would have to endorse the criteria as locally acceptable. We believe that concurrent use of the AEP and CHAEP does help to distinguish cases that require DGH care and resident medical staff from those appropriately managed in the CH. While local circumstances must be taken into account, it is likely that high quality non-ageist medical care will require that most patients satisfying AEP criteria need to be treated in the DGH and also that most patients not satisfying CHAEP criteria should be able to be cared for outside a hospital setting. The combined use of these two tools should provide a health district with a ready means of auditing the appropriateness of inpatient care being delivered.

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