

## Review article

# Transfer and readmission of patients between acute and community hospitals: a retrospective review

Ruth Endacott

Director, Plymouth University/Royal Devon and Exeter Hospital Clinical School, Exeter, UK  
Professor of Clinical Nursing, Monash University Australia

Pat McDonagh

Assistant Director for Community Hospitals, Torbay and Southern Devon Health and Care NHS Trust, Devon

Jane Gidman

Lead for Non-Medical Workforce Professional Development, South Devon Healthcare NHS Foundation Trust, Devon

Rob Bromige

GP, Compass House Medical Centre, King Street, Brixham, Devon, TQ5 9TF, Clinical Lead for Patient Flow, South Devon and Torbay Clinical Commissioning Group

Marie-Helene Arti

Clinical and Professional Development Lead, South Devon Healthcare NHS Foundation Trust, Devon

## ABSTRACT

**Background:** Patients who are discharged from acute hospitals to community hospitals are often readmitted. We conducted a medical record audit for a sample of patients who were admitted to the acute hospital (AH), transferred to a community hospital (CH) and readmitted to the same acute hospital over a 12 month period.

**Aims:** 1. To examine characteristics of patients who were readmitted to an AH after a CH stay. 2. To examine the appropriateness of actions prior to readmission from CH to AH.

**Methods:** A retrospective review of patient records was undertaken between April 2012-March 2013 for one AH and ten CHs serving the same geographical location. Phase 1 audit entailed detailed review of the patient stay in AH and CH. We reviewed the complete AH and CH episode of care for 25 patients, giving 50 episodes of care. The Phase 2 audit entailed detailed review of the decision processes underpinning transfer/readmission for 40 patients and expert review of the appropriateness of the transfer.

**Results:** The median age of the patients was 83 years (IQR 7.50). Median length of stay for the AH episode was 9 days (IQR 11.75). The patients reviewed were physiologically unstable during AH and CH episodes of care. However, none of the patients were acutely unwell in the few hours before transfer from AH to CH. Re-admission to the AH was undertaken out of hours (including weekend day time) for 39 (55%) patients.

In Phase 2 most readmissions were deemed appropriate (31/40; 77.5%). Out of hours readmission across both phases was significantly associated with out of hours transfer ( $\chi^2$  4.812,  $p=0.028$ ) and longer AH length of stay ( $\chi^2$  12.751,  $p=0.047$ ).

**Conclusions:** Timing of transfer from AH to CH should be optimised to ensure patients are discharged when the full range of services is available. CH services could be configured differently with diagnostic and access to doctors provided for longer hours in a smaller number of CH.

**Keywords:** Primary care, audit, care transitions, readmission, community hospital

## How this fits with quality in primary care

### What do we know?

Patients who are discharged from AH to CH are often readmitted.

Transitions in care represent a time of increased vulnerability for older people.

Patients may deteriorate whilst waiting transfer from AH.

### What does this paper add?

Patients managed in CH can be physiologically unstable.

Track and trigger scoring systems have some utility in community hospital settings.

Longer than average length of stay in an AH may be an indicator of increased vulnerability.

## Background

Patients who are discharged from acute hospitals (AH) are often readmitted<sup>1</sup> with rates ranging from 7.0%<sup>2</sup> to 22.3%<sup>1</sup>. Factors associated with readmission include: age, comorbidities<sup>1</sup>, infection<sup>1</sup>, complications of the index admission<sup>2</sup>, functional status<sup>3</sup>, cognitive status<sup>3</sup> and nutritional status<sup>3</sup>. In the US financial penalties have been applied for patients readmitted within 30 days of discharge; a similar approach has been proposed in the UK<sup>2</sup>. However, these financial debates are countered by evidence that some readmissions are not preventable, but instead indicate that appropriate care has been sought for the patient<sup>2, 4</sup>. Whilst care transitions are viewed as 'problematic' and should be avoided<sup>5</sup>, the Royal College of Physicians Future Hospital Commission emphasised that the collaborative management of patients between primary care, secondary (specialist) care and social care services is key to the future of the NHS<sup>6</sup>.

Little is known about readmissions of patients from community hospitals (CH), particularly in the context of the English NHS primary care system. A Community Hospital has been defined in a number of ways<sup>7</sup>; the most recent definition used by the Department of Health in England refers to the community hospital as "a service which offers integrated health and social care and is supported by community based professionals who have direct access to its services"<sup>8</sup>.

In order to better understand the readmission of patients from CH, we conducted a two-phase audit of hospital records for a sample of patients who were admitted to the AH, transferred to a CH and readmitted from the CH to the same AH over a 12 month period in the south west of England.

## Aims and audit questions

**Aim 1:** To examine characteristics of patients who were readmitted to an AH after a CH stay (Phase 1)

### Audit questions:

1. How physiologically unstable was the patient during the AH episode and the CH episode?
2. How often were vital signs recorded at the AH and CH?
3. Was the patient physiologically stable when transferred to the CH?
4. Are transfers and readmissions more likely to happen out of hours?

**Aim 2:** To examine actions taken prior to readmission (from CH to AH) and ascertain whether the readmission was clinically appropriate (Phase 2)

### Audit questions:

1. What were the common reasons for readmission?
2. Was the readmission clinically appropriate?
3. Were there delays in the readmission process? If yes, why did these occur?

## Methods

Medical records audit can be a complex process and often requires manual review of patient documentation<sup>9</sup>. For this study a panel of clinicians assessed medical records and extracted data using an audit tool developed by Kinsman et al<sup>10</sup> and adapted by the authors following pilot work.

Content validity was assessed for each item in the audit tool, to ensure relevance and clarity and exclude extraneous items<sup>11</sup>. A panel of eight experts rated each item for relevance and clarity in relation to the audit questions using the method established by Polit and colleagues (Individual Content Validity Index I-CVI)<sup>12</sup>; I-CVI ranged from 0.76 – 0.98 for the items, deemed acceptable for an eight person panel<sup>13</sup>. Items with lower scores were reviewed and wording clarified where appropriate.

In order to achieve reliability in data extraction, clear definitions were provided. Previously established indicators of physiological deterioration<sup>14, 15</sup> were used to assess vital signs; Early Warning Scoring (EWS)<sup>14</sup> – a track and trigger scoring system used to identifying deterioration from vital signs – was routinely used in the acute hospital and the community hospitals. Co-morbidities were identified from the medical discharge letter provided to the CH. The definition for 'in hours' reflected full service provision at the CH (i.e. medical and therapist services in operation). Hence any transfer to, or readmission from, the CH outside of Monday-Friday 0900-1700 was deemed 'out of hours'. The final audit tool is supplied as electronic supplementary material.

## Setting and participants

We conducted a retrospective review of patient records for a 12 month period for one AH in a Foundation Trust and ten CHs served by a Care Trust. The Foundation Trust covers a catchment of 300 square miles and serves a resident population of 300,000; the Care Trust serves a population of 134,000 and 23% of the population are aged over 65. In the CHs, diagnostics and therapy staff are not available after 1700 hrs but are available at the AH. GP services are accessed through the out of hours service, although there is no contract to support this. Social services are not available out of hours except for emergencies. The total number of CH admissions transferred to the CH from the AH was 2737. Of these 361 (11.55%) were re-admitted to the AH. We excluded: (i) patients originally transferred to the CH for stroke rehabilitation and (ii) patients readmitted from a CH due to staffing shortage. Given that CH organisational factors may have influenced admission and transfer processes, we reviewed medical records for patients transferred to the community hospitals with the greatest levels of transfer/re-admission activity (n=65).

## Data collection

Medical record review was undertaken in two phases:

**Phase 1:** Detailed review of patient stay in AH and CH, including vital signs charting and demographics (timing of AH and CH admission and transfer). We reviewed the complete AH and CH episode for 25 patients, giving a total of 50 episodes of care.

**Phase 2:** Detailed review of the decision process

underpinning transfer (who reviewed the patient, delays in the process) and expert review of appropriateness of the transfer by a panel of senior clinicians. Transfer back to the AH was deemed appropriate if the patient required care not available at the CH. We reviewed 40 episodes of care in Phase 2.

### Data analysis

Descriptive statistics were used to analyse the data with simple cross-tabulations and correlations used as appropriate. Length of stay data were stratified into <5 days, 5-9 days, 10-14 days, 15+ days. As the data were not normally distributed, median, and IQR are reported.

Ethics committee approval was not required for this study as it fell within the definition of audit provided by the UK National Research Ethics Service.

### Results

A total of 90 patient episodes were reviewed (Phase 1 = 50, Phase 2 = 40) and data from a total of 65 patients was included (Phase 1=25, Phase 2 = 40). The median age of the patients was 83 (IQR 7.50), median AH length of stay was 9 days (IQR 11.75) and CH length of stay was 6.5 days (IQR 9.00). Readmission to AH occurred out of hours for 39 (55%) of patients. All patients had at least one co-morbidity (range 1-5), affecting different body systems, presenting an overall picture of multi-organ compromise.

#### Phase 1

Median length of stay for the AH episode in these patients was 12 days (IQR12.50); this is almost three times the average for this particular hospital, as reported in Board papers and the King's Fund review of emergency bed use<sup>16</sup>.

In AH and CHs the level of vital signs recording was appropriate for the physiological condition of the patient. All patients except 2 triggered at least one EWS alert in their AH episode and their CH episode of care. However, none of the patients triggered an EWS alert in the few hours before transfer from AH to CH. Pain scores were more likely to be completed during the AH stay; this is to be expected as part of acute assessment whilst the patient is in the AH. Respiratory disturbance was more prevalent during the CH stay; a respiratory rate of  $\geq 25$  or  $\leq 8$  was recorded at least once for 10 patients (40%) during their CH stay.

Transfer to a CH was undertaken outside of full operating hours (Monday-Friday 0900-1700) for 12 (48%) patients. Re-admission to the AH was undertaken out of hours (including weekend day time) for 17 (68%) patients. Detailed patient risk assessment for the transfer was present in the medical records of 22 (88%) patients.

#### Phase 2

Most patients were readmitted to the AH with the same presenting condition for which they were originally admitted to the AH. Most of the readmissions were deemed appropriate (31/40; 77.5%); 9 readmissions could have been avoided if (i) the patient had been seen by a doctor, (ii) the doctor had access to diagnostics in the CH or (iii) a visiting consultant service had been available. Just over half of readmissions were out of hours (22/40; 55%). There were no obvious delays in the readmission process.

Across the entire patient dataset, patients were more likely to be readmitted to the AH out of hours if they were transferred to the CH out of hours ( $\chi^2$  4.812, df1,  $p=0.028$ ) and if they had a longer stay (stratified) in the AH ( $\chi^2$  12.751, df4,  $p=0.047$ ).

### Discussion

We reviewed 90 episodes of care in this audit in order to examine actions surrounding admission and transfer between AH and CH. Data analysis yielded three important findings: firstly, patients were often acutely unwell during the community hospital episode of care; second, patients had a longer than average AH length of stay prior to transfer and, third, readmissions were mostly appropriate in this cohort of patients.

The patients reviewed were physiologically unstable during AH and CH episodes of care, as evidenced by (i) the frequency of vital signs recording and (ii) prevalence of abnormal vital signs. Patients were not unstable on or immediately after transfer from the AH. Our data illustrate the utility of some form of track and trigger tool in CH to identify physiological instability. Whilst transitions in care have been identified as a time of increased vulnerability for older people<sup>5</sup>, patients can also deteriorate whilst awaiting transfer from the AH<sup>17</sup> hence timely transfer is important for the patient to have the best chance of recovery. Delays in transfer from AH to CH have been identified in a previous study<sup>21</sup>; there was, however, no evidence of discharge delay in the records we reviewed.

Age has been identified as the strongest driver for hospital emergency bed use<sup>16</sup> with men and women over 85 using an average of 5 bed days per annum; this is not surprising given the increased vulnerability of older people to sudden, relatively small, sudden health changes<sup>18</sup>. Just under half of the patients in our study (N=28, 43%) fell within this age group and many of the acute changes were sudden. Patients in our study who were readmitted had co-morbidities; this has been found in previous studies: in a review of 10,731 hospital discharges in the US, Donzé and colleagues<sup>1</sup> found that patients with co-morbidities were more likely to be readmitted. Admission has been described

**Table 1:** Age, length of stay and out of hours transfer/readmission in the Acute Hospital (AH) and Community Hospital (CH) for Phases 1 and 2.

	Phase 1 (n=25)	Phase 2 (n=40)
Median age [IQR]	85.00 [11.00]	83.00 [7.50]
Median length of AH stay [IQR]	12.00 [12.50]	9.00 [9.00]
Median length of CH stay [IQR]	8.00 [8.75]	5.00 [9.00]
Out of hours transfer [%]	12 [48]	16 [40]
Out of hours readmission [%]	17 [68]	22 [55]

as an indicator, or litmus test, of the ability to manage chronic disease outside of hospital<sup>19</sup>. Our findings indicate this does not apply to the group of patients we investigated.

Longer than average length of stay in the AH and transfer out of hours may be useful indicators of heightened vulnerability; whilst this may be a useful trigger for some form of frailty assessment<sup>20</sup> prior to transfer to a CH, up to 75% of people over 85 are not frail<sup>18</sup> hence this may be of limited value.

The phase 2 audit showed that patients readmitted to the AH suffered sudden acute episodes and most of the readmissions to the AH were appropriate. Whilst nine patients could have been managed with immediate access to a doctor on site, this is not the current service provision. Hence it is not appropriate to suggest that care provider tolerances should be reduced for managing sick patients in community hospitals.

### Limitations

There are limitations to this study. The study was a retrospective review using data not originally collected for research purposes. We did not limit the readmission period but 62 of the 65 readmissions (95%) were within the 30 day limit used as an inclusion criterion for other studies<sup>2,22</sup>. Given that the patients we were concerned about were transferred between health services rather than discharged, per se, we decided to capture all patients within the timeframe. Finally, we did not capture whether patients went to the CH closest to address of usual residence; this may have had some influence on transfer and/or readmission decisions.

### Implications

Our findings illustrate the utility of track and trigger scoring in CH. Systematic collection of these data, particularly via electronic capture<sup>23</sup> provides a useful resource for service planning.

Timing of the transfer from AH to CH should be optimised to ensure patients are discharged to a CH when the full range of services is available.

CH services could be configured differently with diagnostic and access to doctors provided out of hours in a small number of CH and patients 'triaged' to these CH on discharge from the AH, similar to integrated primary/secondary care reported elsewhere<sup>24</sup>. However, this requires access to expert advice 24/7 in a timely manner (GP/Out of Hours Dr/Cons) maybe via online communication media, such as Skype<sup>25</sup>. Given the profile of this cohort, such expertise might be in consultants dealing with older people, rather than disease-specific expertise.

### DECLARATIONS

Ethical approval was not required for this study as it falls within the definition of audit provided by the National Research Ethics Service.

### ACKNOWLEDGEMENTS

The authors wish to acknowledge the assistance with data collection provided by Liz Stirling, Birgit Morrison, Martyn Bradbury and Tracey Proctor-Childs

### REFERENCES

1. Donzé J, Lipsitz S, Bates DW, Schnipper JL (2013) Causes and patterns of readmissions in patients with common comorbidities: retrospective cohort study. *BMJ*: 347 f7171.
2. Blunt I, Bardsley M, Grove A, Clarke A (2014) Classifying emergency 30-day readmissions in England using routine hospital data 2004-2010: what is the scope for reduction? *Emerg Med J*
3. Leong IYO, Chan SP, Tan BY (2009) Factors affecting unplanned readmissions from community hospitals to acute hospitals: a prospective observational study. *Ann Acad Med Singapore* 38: 113-120
4. Joynt KE, Jha AK (2012) Thirty day readmissions – truth and consequences. *NEJM* 366: 1366-1369
5. Ellins J, Glasby J, Tanner D, McIver S, Davidson D, et al (2012) Understanding and improving transitions of older people: a user and carer centred approach. Final Report. NIHR Service Delivery and Organisation programme; 2012.
6. Future Hospital Commission (2013) Future hospital: caring for medical patients. A report from the Future Hospital Commission to the Royal College of Physicians, London.
7. Heaney D, Black C, O'Donnell C (2006) Community hospitals - the place of local service provision in a modernising NHS: an integrative thematic literature review, *BMC Public Health* 6: 309.
8. Department of Health. Our Health, Our Care, Our Community - Investing in community hospitals and services. London: Department of Health 2006
9. Worster A, Haines T (2004) Advanced statistics: understanding Medical Record Review (MRR). *Acad Emerg Med* 11: 187-192.
10. Kinsman L, Champion R, Cooper S (2012) The FIRST2ACT simulation program improves nursing practice in a rural Australian hospital. *Australian Journal of Rural Health* 20: 270-274.
11. Bannigan K and Watson R (2009) Reliability and validity in a nutshell. *Journal of Clinical Nursing*. 18: 3237-3243
12. Polit DF, Beck CT, Owen SV (2007) Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing and Health* 30: 459-467.
13. Lynn MR (1986) Determination and quantification of content validity. *Nursing Research* 35: 382-385.
14. Subbe C, Kruger M, Rutherford P, Gemmel L (2001) Validation of a modified early warning score in medical admissions. *QJM* 94: 521-526.
15. Smith GB, Prytherch DR, Schmidt PE, Featherstone PI (2008) Review and performance evaluation of aggregate weighted 'track and trigger' systems. *Resuscitation* 77: 170-179.

16. Imison C, Poteliakhoff E, Thompson J (2012) Older people and emergency bed use: exploring variation. King's Fund: London.
17. Jasinarachchi KH, Ibrahim IR, Keegan BC, Mathialagan R, McGourty JC, et al. (2009) Delayed transfer of care from NHS secondary care to primary care in England: its determinants, effect on hospital bed days, prevalence of acute medical conditions and deaths during delay, in older adults aged 65 years and over. *BMC Geriatrics* 9 (4).
18. Clegg A, Young J, Illife S (2013) Frailty in elderly people. *The Lancet* 381: 752-762
19. Bardsley M, Georghiou T, Chassin L (2012) Overlap of hospital use and social care in older people in England. *J Health Serv Res Policy*.
20. Ravaglia G, Forti P, Lucicesare A, Pisacane N, Riette E, et al. (2008) Development of an easy prognostic score for frailty outcomes in the aged. *Age and Ageing* 37: 161-166.
21. Baillie L, Gallini A, Elworthy G (2014) Care transitions for frail, older people from acute hospital wards within an integrated care system in England: a qualitative case study. *International Journal of Integrated Care*.
22. Jencks SF, Brock JE (2013) Hospital accountability and population health: lessons from measuring readmission rates. *Annals of Internal Medicine* 2013; 159: 629-630.
23. Jones S, Mullally M, Ingleby S, Buist M, Bailey M, et al. (2011) Bedside electronic capture of clinical observations and automated clinical alerts to improve compliance with an Early Warning Score protocol. *Critical Care and Resuscitation* 13: 83-88.
24. Tucker H (2013) Discovering integrated care in community hospitals. *Journal of Integrated Care* 21: 336-346
25. Dixon RF (2010) Enhancing primary care through online communication. *Health Affairs* 29: 1364-1369

#### ADDRESS FOR CORRESPONDENCE

Ruth Endacott, Director, Plymouth University/Royal Devon and Exeter Hospital Clinical School, Rolle Building, Drake Circus Campus, Plymouth University, Plymouth PL4 8AA, United Kingdom, e-mail: [ruth.endacott@plymouth.ac.uk](mailto:ruth.endacott@plymouth.ac.uk)