Rapid Response Report NPSA/2011/RRR001

Essential care after an inpatient fall

January 2011

Supporting information
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This supporting information should be read in conjunction with Rapid Response Report NPSA/2011/RRR001, Essential care after an inpatient fall available at www.nrls.npsa.nhs.uk/alerts.

1. Background

National Reporting and Learning System (NRLS) data\(^1\) from across England and Wales indicate that approximately 208,000 falls are reported in acute hospitals every year, with over 36,000 reported from mental health units and 38,000 from community hospitals. A significant number of these falls result in death, severe or moderate injury, including around 840 fractured hips, 550 other types of fracture, and 30 intracranial injuries. Even for the less serious falls the human cost of falling includes distress, pain, injury, loss of confidence and loss of independence, as well as the anxiety caused to patients, relatives, carers and hospital staff.

The causes of falls are complex. Hospital patients are particularly likely to be vulnerable to falling due to medical conditions including delirium, cardiac, neurological or muscular-skeletal conditions, side effects from their medication, or problems with their balance, strength or mobility.\(^2\) Problems like poor eyesight or poor memory can create a greater risk of falls when someone is out of their normal environment on a hospital ward, as they are less able to spot and avoid any hazards. Continence problems can mean patients are vulnerable to falling while making urgent journeys to the toilet.\(^3\) In hospital settings falls are also often an ominous ‘red flag’ symptom indicating the patient’s underlying medical condition may have deteriorated, and may merit urgent medical review regardless of injury.\(^2\)

Prevention of falls is understandably an important patient safety challenge for most healthcare settings and a range of resources exist to help healthcare staff with this.\(^4\) But what happens after a fall is equally important, as detecting and treating injury from the fall as efficiently as possible will reduce the degree of harm caused to the patient. This is particularly critical for injuries such as subdural haematoma that may progress to irreversible brain damage if not detected early\(^5\) and fractured hip, where minimising the time elapsed between fracture and surgery is vital to reducing mortality and disability.\(^6\) However, the relative rarity of inpatient falls that result in serious injury – less than one per cent of reported falls\(^1\) – can make it challenging for staff to maintain their vigilance.

General issues of failures in aftercare had been previously identified from NRLS data and a recommendation for NHS organisations to develop post-fall protocols was made by the NPSA in 2007 in Slips trips and falls in hospital.\(^3\)

2. Review of evidence of harm

Search strategy

Updated national falls data\(^1\) were the basis of the analysis for the Rapid Response Report (RRR). A range of keywords were used to detect fracture, especially fractured hip, and to detect brain injury followed by clinical review. Details of keywords and the review process are available.\(^1\) Incidents where fracture or brain injury from an inpatient fall had been clinically or radiologically confirmed, and where there were apparent failures in aftercare, were identified through clinical review of free text. The search period was incidents occurring between 1 January 2009 to 31 December 2009 and reported by 25 March 2010. The search was limited to incidents coded by the reporter as causing moderate or severe harm or death (as failures of aftercare with serious consequences are the primary concern of the RRR). All...
death and severe harm incidents were reviewed, alongside a sample of 500 incidents drawn from 1776 moderate harm incidents that included the keywords indicative of fracture or brain injury.

**Key findings**

Seventy-five incidents described apparent failures in retrieval, or detection and treatment of injury, after inpatient falls resulting in fracture or brain injury. Given sampling of ‘moderate’ harm cases this would increase to around 200 incidents had the whole sample been reviewed (approximately 14 per cent of the 1420 fractures or intracranial injuries described above in reference 1).

**Injuries involved:**

The injuries that went undetected or where treatment was delayed were in some cases multiple, but counting the most serious injury in each case, injury types were:

- 11 intracranial/subdural bleeds attributed to the trauma of the fall;
- 45 fractured hip;
- 2 spinal fractures;
- 17 other fractures.

**Nature of delay/inappropriate aftercare/delays in treatment:**

Very few of the incidents were related to difficult to detect injury or difficult to interpret x-rays. The majority of the delays appeared to be in basic assessment and observation, with patients either not examined by medical staff or superficially examined. Although many of the patients were confused and unlikely to have given a coherent account of their fall or their symptoms, the reports indicate they were usually expressing pain or distress. In other examples there were obvious external indications of injury found by later observers (although this may relate to bruising becoming more visible with time, or undisplaced fracture displacing later, etc). Delays in fracture detection ranged from a few hours to several days. In several cases transfer between wards, or discharge home, was when the fracture was detected.

**Other issues included:**

- difficulty in accessing orthopaedic advice or orthopaedic beds (delaying diagnosis or surgery);
- unsafe retrieval (for example use of sling hoists despite suspected spinal injury or obvious fracture);
- failure to consider the greater vulnerability of anticoagulated/coagulopathic patients;
- neurological observations taken only once, immediately after the fall;
- patients with repeated falls where date of fracture could not be established.

While the search strategy and criteria for inclusion above was not designed to find incidents where a new illness/collapse caused the fall (for example cardiac problems or spontaneous intracranial bleed) examples of equivalent lapses in observation or medical review have also been reported to the NRLS.
Evidence of harm

It is not easy to separate the mortality and morbidity resulting from the fall injury from that resulting from the delay in treating the injury. Some intracranial injury is likely to have been untreatable even if detected in a more timely way, and some patients already had a terminal illness when they fell.

Before adjustment for sampling there were 11 reports of delayed diagnosis of traumatic intracranial/subdural bleeds (four fatal by the time of reporting). There were 45 reports of unsafe handling or significant delays in detecting or treating a fractured hip (three patients had died by the time of reporting). Delays in operating on a fractured hip are known to have significant impact on both mortality levels and the likelihood of the patient regaining their former level of independence. Inappropriate handling (for example sling hoist or wheelchair use despite obvious deformity from hip fracture) can cause intense pain and may reduce the likelihood of successful surgery.

For the more ‘minor’ fractures (including fractures of the humerus, pubic rami, or lower limbs) serious consequences of the delay in diagnosis were noted in a minority of cases in terms of loss of function or mobility. Unnecessary pain resulted in many of these cases, either through inappropriate retrieval and efforts to get the patient mobile again, or through prescribing painkillers appropriate for bruises, not fractures.

Examples of incidents reported to the NRLS

Examples: neurological observations not taken or taken only once

Patient fell in the corridor walking to the toilet …… Neuro obs were recorded and GCS 14 extensive swelling noted to cut on left eyebrow and steristrips were applied. Also had painful arm and required analgesia. Patient was reviewed by the doctor – x-ray requested due to query fractured shoulder. Patient was responsive at 08:00. She was referred to Orthopaedics re dislocated shoulder and kept nil by mouth pending theatre. At 10:30am patient became unresponsive and was reviewed by the doctor. Attended for urgent CT which radiology informed staff that result showed a large left sided subdural haematoma. Reviewed by Neurosurgeon who stated that patient would not survive surgery…….

Patient suffered head injury on ward previous day. Found 11.30 unconscious (GCS 3/15) bleeding from nose and aspirating blood. Fixed and dilated pupils. Significantly abnormal cardiovascular and respiratory observations. Coagulopathy on background of alcoholic liver disease. ISSUES…….No neuro obs being carried out after injury.

Examples: delay in diagnosis of fracture or dislocation

Staff heard a bang and found pt sitting on the floor by her bed, she said she rolled out of bed. Patient got up with minimal assistance, no visible injury, complaining of pain to right ribs. Reassurance given, BP 146/70, P 74, T 36.2, refused pain relief medication. Dr bleeped, reviewed by Psych SHO. Sent to [acute hospital] [eight days post fall] admitted # right neck of femur and 7&8 right ribs, died [15 days post fall].

Patient admitted to [ward a] from [ward b] - on transfer to ward patient had pain in R hip and nursing assistant noticed R leg was shorter and rotated – staff nurse informed, on call doctor informed x-ray requested and shows that hip is dislocated, notes state patient fell [three days earlier]. Manipulation on ward unsuccessful so patient is now for high risk surgery.
Standing from toilet became dizzy stated that she fell to the floor unwitnessed by staff. Sitting on floor on arrival complaining of pain in right side, rib/back pain. Observations recorded and monitor. SHO informed to review. Codeine/paracetamol prescribed. Inform family. Chest x-ray [two days later] probable rib # plural collection. Patient not to be left alone in patient toilet facilities. 2 # ribs haemothorax chest drain [five days later] transferred to ITU……

Example: no examination

[Evening] Patient found sitting on the floor opposite to toilet in the bay. Staff nurse on night duty, initially had no cause to think this gentleman had injured himself, there was no complaint of pain and they assisted him back to bed. When they later went to him he was in more discomfort and one leg appeared shorter than the other. The staff informed the next of kin who later visited the ward. The ward team and consultant were made aware first thing in the morning. They reviewed patient and requested an x-ray. On x-ray he has fractured his hip.

Coroners’ cases

The NPSA is aware of two deaths where the coroner believed there were failures of aftercare following an inpatient fall. These coroners’ cases identified similar issues to those found in NRLS data, including failure to correctly immobilise spinal fracture, delays in accessing orthopaedic advice or CT scanning, and neurological observations taken irregularly or only once.

Falls in children

Although none of the incidents of failures in aftercare described above affected children, the NRLS receives around 2,500 reports of children falling in hospitals each year; the vast majority of these cause no harm or low harm. Reports are also received of infants accidentally dropped by their parents or carers in inpatient settings. Because of this, the actions in this RRR are relevant to settings providing care to children, with adaptations as appropriate. For example, children’s units would use a Glasgow Coma Scale designed for use in children (see http://www.nice.org.uk/CG056, the falls prevention resources area of www.patientsafetyfirst.nhs.uk and http://www.bpna.org.uk/audit/GCS.PDF).

3. National standards and best practice

It is not feasible to provide, in this supporting information, all the clinical guidance relevant to the investigation and treatment of the range of injuries potentially sustained in a fall. Community hospitals and mental health units can access the relevant expertise via their local emergency services. Acute hospitals can use the expertise of their emergency department and orthopaedic staff to develop post-fall protocols that conform to national guidance.

Key reference documents for standards of aftercare following a fall include:


The NICE guidance contains the following advice on frequency of neurological observations:

1.7.2.1 For patients admitted for head injury observation the minimum acceptable documented neurological observations are: GCS; pupil size and reactivity; limb movements; respiratory rate; heart rate; blood pressure; temperature; blood oxygen saturation

1.7.3.1 Observations should be performed and recorded on a half-hourly basis until GCS equal to 15 has been achieved. The minimum frequency of observations for patients with GCS equal to 15 should be as follows, starting after the initial assessment in the emergency department:

- half-hourly for 2 hours
- then 1-hourly for 4 hours
- then 2-hourly thereafter.

1.7.3.2 Should a patient with GCS equal to 15 deteriorate at any time after the initial 2-hour period, observations should revert to half-hourly and follow the original frequency schedule.

4. Advice from clinical staff

Anecdotal evidence from clinical contacts indicates that many nursing, medical and physiotherapy staff have encountered delayed detection of fractures after inpatient falls in the course of their career. However they believed the relative rarity of serious injury from inpatient falls meant it was difficult for them to maintain high awareness of the risk. Physiotherapy contacts reported experience of detecting fractures of the hip, pubic rami and cervical vertebra that had initially been missed. Nursing contacts confirmed that because suspected spinal injury is fairly unusual, they would have difficulty knowing how they should access equipment and advice, but most acute hospital staff would approach a trauma ward, an orthopaedic colleague, or their emergency department. Staff in community hospitals and mental health units would keep the patient still and call emergency services. The potential harm from sling hoisting patients with fracture was thought to be a very under-recognised risk, and some staff in acute hospitals were unsure if they could access any alternative equipment (because their organisation had no flat-lifting equipment, or they did not know where to find it, or how to use it).

Manual handling experts confirmed a range of equipment is available that can be used to move patients with suspected fracture or suspected spinal injury. They considered that staff training on retrieving patients after a fall often focuses primarily on manual handling challenges and avoiding injury to staff. Training could include more emphasis on special considerations to avoid exacerbating any injury or suspected injury suffered by the patient. They also noted that staff needed to be encouraged to ‘stop and think’ before moving the patient. Additionally, they mentioned that ensuring all staff maintained skills in techniques such as log-rolling was impractical. It was also a challenge to ensure enough staff experienced in log-rolling were available to assist other wards and departments. Emergency medicine contacts believed wards would be challenged by major trauma from falls or suspected spinal injury out of hours, with the wards usually turning to critical care outreach teams who may not be experienced in dealing with trauma. Orthopaedic contacts recognised
the risks of missed fracture and unsafe retrieval but emphasised the need to avoid harm from unnecessary immobilisation through prompt investigation and treatment after a fall.

Falls and bone health experts noted that although the focus of the RRR is inevitably on the more serious injuries sustained in falls, staff need to be aware that falls resulting in minor fractures in patients over 60 should prompt further assessment of the patient's bone health. This is to ensure treatment for osteoporosis can be given if required.

Community hospitals and mental health unit staff generally had no issues with serious injury, since they could call emergency services who could retrieve the patient in the appropriate way. Occasionally they experienced delays with patients who needed an urgent response but where the designation of the unit as a ‘place of safety’ meant they were a lower priority for emergency services. Isolated units described delays in getting treatment for less serious injuries, particularly if they were too small to have spare staff to escort a patient to the emergency department at night, or had no access to appropriate transport (for example a wheelchair-friendly taxi).

5. Local hospital policies and protocols

Based on a random sample policy survey undertaken as evaluation of Slips trips and falls in hospital, the number of inpatient falls prevention policies that include advice on clinical checks after a fall has risen from 19 per cent in 2006 to 51 per cent in 2009. However, very few of these post-fall protocols can be considered ‘gold standard’. Many policies appear to have drawn post fall instructions from a health and safety context and omit clinical considerations (for example ‘make the area safe and report the incident’). There are few protocols that also cover the common scenario of a patient falling because of new acute illness (for example heart block, stroke, etc). Based on this survey, important clinical components of a post-fall protocol include:

- ABC (Airway/breathing/circulation);
- initial checks before attempting to move the patient for signs of serious injury (for example pain, limb deformity, loss of sensation);
- safe retrieval, including how to access equipment and expertise for patients who need immobilisation or flat-lifting, and pain relief before moving the patient if appropriate;
- observations to detect any potential new acute illness that caused the fall and to detect any harm from the fall (for example temperature, pulse, respiratory rate, blood pressure, oxygen saturations, blood glucose);
- frequency and duration of neurological observations not only for patients with visible or reported head injury, but also for patients where head injury cannot be excluded (for example an unwitnessed fall). This may include a more intensive and prolonged schedule of observation for patients who are on anti-coagulants or who are coagulopathic;
- criteria that indicate which patients and circumstances need immediate, urgent, or routine medical review, investigations, or referral to specialist teams, including special consideration of patients who are on anti-coagulants or who are coagulopathic;
- providing appropriate supportive care (for example pressure relief, pain relief, fluid balance) for patients with significant injury;
- explaining to the patient what is being done and why while working through the steps above;
- actions to reduce the risk of further falls and fragility fractures, including identifying and acting on underlying risk factors, identifying and treating osteoporosis, and
considering the need for falls prevention equipment or special observation (see *Slips, trips and falls in hospital* and *The ‘How to’ guide to reducing harm from falls*);

- non-clinical aspects of falls prevention, including making safe any environmental hazard, reporting and investigation processes, informing relatives, keyworker etc.

In revising local post-fall protocols, organisations should take advice from their local emergency department. This is so that observations and investigations for inpatients after a fall (for example frequency of neurological observations and thresholds for x-ray or CT scanning) reflect those which would be undertaken for patients presenting to emergency departments and conform with NICE Clinical Guideline 56. Local emergency departments will also be well placed to advise on avoiding unnecessary application of immobilisation and ensuring any period of immobilisation and subsequent management is appropriate and as short (but effective) as possible. Such advice may be based, for example, on Advanced Trauma Life Support guidelines or National X-Radiography Utilization Study Group (NEXUS) or Canadian cervical spine imaging rules.

Community hospitals, mental health units, and isolated satellite units of acute trusts should discuss their thresholds for accessing emergency services after an inpatient fall with their local ambulance service and emergency department.

Concerns have previously been raised that hospitals continue to use an outdated 14 point form of the Glasgow Coma Scale (GCS), and even hospitals using the correct 15 point scale may be reliant on local photocopying that over time creates blurred and poor quality formats. As part of revising their post-fall protocol, organisations should ensure all wards and inpatient units have access to clear versions (examples can be found at [http://www.nice.org.uk/CG056](http://www.nice.org.uk/CG056) and that old stationery is destroyed. Where possible formats for recording neurological observations should also contain clear guidance on how to correctly take and record the GCS (for example advice on how to determine best motor response on the rear of the chart). Examples can be found in the falls prevention resources area of [www.patientsafetyfirst.nhs.uk](http://www.patientsafetyfirst.nhs.uk). Locally used formats should emphasise the need to seek urgent medical review if the GCS drops.

For further detailed advice on hospital falls prevention, including secondary prevention following an inpatient fall, see *Slips, trips and falls in hospital* and *The ‘How to’ guide to reducing harm from falls*.

### 6. Cost implications

There should only be minor costs involved in implementing this RRR, for example in revising local guidance, although for those acute hospitals that do not already have access to flat lifting equipment, procurement of such may be considered necessary. There are cost benefits of reducing failures in aftercare following inpatient falls as mortality and morbidity (and associated extended length of stay) would be reduced.

### 7. Acknowledgements

The NPSA is grateful for the advice and support of the Royal College of Physicians Falls and Bone Health Steering Group, the Chartered Society of Physiotherapy, the FallSafe steering group, the College of Emergency Medicine, Mr Martin Wiese, and to all other Royal Colleges and experts who contributed.
8. References


# Appendix: Summary of rationale for recommended actions and suggested evidence for compliance

This table provides a summary of how the incident reports, local policy review, and literature explored above informed our recommended actions, and gives suggested evidence that organisations may wish to use locally as assurance of compliance with this RRR.

<table>
<thead>
<tr>
<th>Action</th>
<th>Summary of rationale</th>
<th>Suggested evidence of compliance</th>
</tr>
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<tbody>
<tr>
<td>1 1</td>
<td>They have a post-fall protocol that includes:</td>
<td>Moving a patient with potential for spinal injury or suspected fracture before their injury has been appropriately immobilised can cause severe harm. An initial brief assessment can identify if there is any pain, loss of sensation, visible injury or limb deformity that could indicate a fracture.</td>
</tr>
<tr>
<td>a)</td>
<td>checks by nursing staff for signs and symptoms of fracture or potential for spinal injury before the patient is moved;</td>
<td>If a hoist and a fabric sling are used for a patient with spinal fracture, the spinal cord can be damaged. For a fractured hip this method could displace the fracture causing internal bleeding and severe pain and make surgical intervention more complex.</td>
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<td>b)</td>
<td>safe manual handling methods for patients with signs or symptoms of fracture or potential for spinal injury;*</td>
<td>Fallers can lose consciousness in syncope falls but be unaware this has happened, so head injury cannot be excluded except in witnessed falls. Reports to the NRLS suggested that sometimes neurological observations were taken only once, or staff were unsure how often to take them or how long to continue them.</td>
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<tr>
<td>c)</td>
<td>frequency and duration of neurological observations for all patients where head injury has occurred or cannot be</td>
<td></td>
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</tbody>
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*Refers to patients who may be at risk of spinal injury but do not meet formal criteria for spinal injury assessment.
<table>
<thead>
<tr>
<th>Excluded (e.g., unwitnessed falls) based on National Institute for Health and Clinical Excellence (NICE) Clinical Guideline 56: Head Injury;</th>
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<tr>
<td>Not every patient who falls can be seen urgently, as in acute hospitals there may be other patients who are a higher priority through illness, and in mental health units and community hospitals there will not always be a doctor in residence. But some patients do need urgent medical examination, and systems need to be in place to ensure this happens. Even for patients with no obvious need to be urgently examined, examination needs to take place within a reasonable timescale. Medical examination is important not only to detect injury but because falls are often a ‘red flag’ for changes in the patient’s underlying medical condition. If the patient has been immobilised as a precautionary measure, access to investigation and treatment must be speedy to avoid the risk of prolonged immobilisation and associated complications.</td>
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<tr>
<td>Copy of the protocol approved by the appropriate committee and with this content highlighted.</td>
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<tr>
<td>For community hospitals, mental health units, and satellite sites of acute hospitals without resident medical staff, this needs to include plans to manage injury that does not warrant calling emergency services but cannot be left until the next planned medical visit. For example taxi transfer with escort for a small laceration needing suturing.</td>
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<tr>
<td>For easy reference.</td>
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<td>Evidence this has been distributed and is accessible (e.g. spot check of ten wards/units).</td>
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* Community hospitals and mental health units may be able to achieve this in collaboration with emergency services