How to reduce harm (inpatient falls), improve quality and save costs
A practical step-by-step guide for ward staff and frontline healthcare teams
The Stepwise approach has gained national recognition as a winner in the HSJ Patient Safety Awards 2011.

Contents:

Page 4. Introduction
Page 7. The Stepwise approach
Page 11. Step 1: How to understand the size and nature of the harm
Page 18. Step 2: How to work out how much the harm is costing
Page 21. Step 3: How to find the interventions that will work best
Page 26. Step 4: How to quantify how much each intervention will cost
Page 28. Step 5: How to use your data to influence others
Page 33. Next steps
Page 34. Appendices
Page 38. Acknowledgements

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Reducing human suffering motivates us to improve safety in our hospitals. Already, some good resources have been developed to help NHS organisations understand and prevent falls - including the Patient Safety FIRST ‘How to’ Guide for reducing harm from falls (2009).

Yet, there is a gap when it comes to helping frontline NHS staff find answers to three fundamental questions underlying falls, or indeed other forms of patient harm:

1. How big is the problem?
2. What is the solution and what will it cost?
3. What is the harm costing us and how much can we save by implementing the improvements?

This guide, and the Stepwise approach it describes, is a response to that gap. In particular, Stepwise is the result of a close partnership between the NHS Institute for Innovation and Improvement and frontline clinical, financial and management teams at Wrightington, Wigan and Leigh NHS Foundation Trust (WWL).

The joint initiative began in November 2009 to help the Trust ascertain the true size and financial impact of falls by establishing comprehensive, integrated datasets and implementing the most effective interventions to improve the outcomes. We also wanted to test out detailed methodologies and see if these would work in an operational clinical setting.

Our aims have been twofold:

- To halve the number of falls in the trust within two years (baseline 2008-09).
- To develop a business case for safety by collecting and integrating patient-level clinical and cost data.

While the initiative is ongoing, the results to date are extremely encouraging:

- Falls have dropped by 18% following the introduction of a new TEAM RED checklist.
- The trust has established a business case for achieving a saving of £120k through a 50% reduction in falls.
- The work has gained national recognition as a winner in the HSI Patient Safety Awards 2011 and has also been commended by the Healthcare Finance Management Association in its 2010 annual awards.

This short guide is based on the ‘how did we do it?’ ethos and describes the practical wisdom gained from what has worked in a real clinical setting, with real patients and staff.

I hope frontline clinical and finance leads and wider healthcare teams will use it as a sensible, achievable approach to reducing patients’ suffering; nailing down the real cost of harm in their ward or organisation; and finding ways to achieve the biggest, most sustainable local returns in terms of safety, quality and cost outcomes.

Dr Mahmood Adil
CertiMed, DipPInformatics, MHSIM, FRCP, FFPH
National QIPP* Advisor - Clinical & Finance Engagement
Department of Health
(*Quality, Innovation, Productivity & Prevention)

Introduction

By Dr Mahmood Adil, National QIPP Advisor and Fellow, NHS Institute for Innovation and Improvement

I am delighted to welcome you to the Stepwise Guide. It has been developed by the NHS Institute for Innovation and Improvement in close collaboration with frontline NHS teams, the National Patient Safety Agency (NPSA), the Institute for Healthcare Improvement in the United States, and other experts in safety and quality, both in the UK and abroad.

It comes at an important time. Inpatient falls are the most common causes of patient harm in the NHS. In England & Wales, 283,438 incidents were reported to the NPSA between October 2008 and September 2009.1

A significant number of these falls resulted in death (83 deaths). Others resulted in severe or moderate injury - including around 840 fractured hips, 550 other types of fracture and 30 intracranial injuries.

The human cost of inpatient falls is high and they have a significant financial impact on organisations. Even less serious falls can cause distress, pain, injury, loss of confidence, as well as anxiety for relatives, carers and hospital staff.


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The *Stepwise* approach

Step 1: How to understand the size and nature of the harm
Step 2: How to work out how much the harm is costing
Step 3: How to find the interventions that will work best
Step 4: How to quantify the cost of each intervention
Step 5: How to use your data to influence others
Understand your data sources:

Understanding where your data will come from is crucial – everything revolves around this. Work with your strategic and operational teams to agree what data you will need and where it will be drawn from. It will come mainly from routine data sources (see page 11), but you will need to think about how you will customise your data collection (so it is as relevant as possible to your improvement) and how available these sources are to the frontline teams. This is because frontline staff will need to access the data and add to it while implementing the harm reduction measures.

Keep communicating:

Every improvement guide is likely to say this...but it’s no less valid here. As well as a sensible systematic approach and some technical know-how, success with Stepwise depends on everyone at all levels understanding what they are doing and why they are doing it. It will be about finding the messages that really hit home to busy ward teams and operational staff. For example: ‘If staff get access to reliable data on a routine basis – they can make critical decisions to avoid harm’. Work with your strategic and operational teams to plan regular and meaningful communications; both internally among the teams carrying out the Stepwise work, and externally, with staff, patients and your board. Your communications strategy needs to start now not later.

**Start small:** Stepwise is not a prescriptive line-by-line approach that will tell you exactly what to do at each stage. It is a simple systematic approach to reducing harm and saving cost in your organisation. Stepwise helps you ask the right questions of the right people so that you end up with reliable, valid data on which to build and measure your improvement efforts. Because there is so much that will depend on your own local circumstances, we suggest starting small. Once you have diagnosed the harm and what it is costing, test out your interventions on a few wards or across just one specialty first. In this way you can refine your approach and learn any lessons in order to create a sustainable system that can be spread more widely across your trust.

**Get the right support:** As with any improvement programme, having the right people on board and strong leadership are crucial. It is a good idea to ‘formalise’ these relationships by setting up a strategic team and an operational team. Below are the team configurations that worked well in one of our main Stepwise test sites, Wightington, Wigan and Leigh NHS Foundation Trust.

### The strategic team

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement Leader for the initiative</td>
<td>Trust Chief</td>
</tr>
<tr>
<td>Medical Director</td>
<td>Finance Director</td>
</tr>
<tr>
<td>Director of Nursing and Clinical Governance</td>
<td>Head of Health Informatics</td>
</tr>
</tbody>
</table>

The strategic team will ensure strong leadership and access to crucial data at all stages of your harm reduction work. Members will be very visible supporters and champions, ideally promoting your aims, progress and findings widely across the trust. However, because they are senior people, it will be very important to agree their time input from the outset. This will be for you to decide locally, but one meeting every two months is probably the minimum you should aim for.

### The operational team

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant from specific specialty</td>
<td>Consultant from specific specialty</td>
</tr>
<tr>
<td>Communication Officer (Corporate Communications &amp; Marketing Department)</td>
<td>Communication Officer (Corporate Communications &amp; Marketing Department)</td>
</tr>
<tr>
<td>Improvement Leader for the initiative</td>
<td>Improvement Leader for the initiative</td>
</tr>
<tr>
<td>Patient Safety Manager/Matron</td>
<td>Patient Safety Manager/Matron</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>Pharmacist</td>
</tr>
<tr>
<td>Member, Corporate Informatics</td>
<td>Member, Corporate Informatics</td>
</tr>
<tr>
<td>Member, Trust Finance Team</td>
<td>Member, Trust Finance Team</td>
</tr>
<tr>
<td>Trust Data Analyst</td>
<td>Trust Data Analyst</td>
</tr>
<tr>
<td>Representatives from pilot ward team (Ward Nurses)</td>
<td>Representatives from pilot ward team (Ward Nurses)</td>
</tr>
<tr>
<td>Junior Doctor</td>
<td>Junior Doctor</td>
</tr>
</tbody>
</table>

The operational team will support the Stepwise work on a more practical level. One of the first main roles for this team, for instance, will be to agree a clear definition for the harm you are tackling. You can also ‘grow’ the team as needed – eg adding in representatives from the wards where you may be piloting the interventions. Remember to agree the frequency of meetings with your operational team right from the start – you will need their input at regular intervals throughout the work.

### Key factors to achieve the results

<table>
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1.1 Define the harm

The first step is to agree one clear definition of your harm. This is important because establishing a common understanding, or using a standard definition of the harm, can have a dramatic impact on your results. If your harm is falls, for example, is there a shared understanding of what constitutes a fall and how its severity is defined?

The National Patient Safety Agency (NPSA) has published a useful set of definitions for the severity of harm and has adapted this for falls (see Appendix A page 34). You can use this as a guide to defining your harm and its various degrees of severity.

Whichever approach you take, you will need to work with your operational team to agree your harm definition and use this consistently throughout the work and throughout any future data collection you do.

1.2 Start building your harm ‘picture’

Once you have an agreed definition for your harm you can begin to build a picture of the size and nature of the problem in your organisation. Importantly, you can do this using existing routine data sources.

Step 1: How to understand the size and nature of the harm

Aims:

a. Define your ‘harm’

b. Identify the size and nature of the problem using routine information sources

1.1 Define the harm

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Find out more...

• If you are not already familiar with it, the PDSA (Plan, Do, Study, Act) Small Cycles of Change model is a well-used and simple method for testing your improvements in bite-sized stages. You can learn more about PDSA in Step 2, page 20, or get full details of PDSA and other practical resources by clicking the ‘Quality and Service Improvement Tools’ link on the NHS Institute for Innovation and Improvement’s website at: http://www.institute.nhs.uk/pdsa

• The originator of the PDSA methodology, The Institute for Healthcare Improvement in Boston, USA, has also developed a useful PDSA worksheet that you can use to test each stage of your improvement. Go to www.ihi.org and enter ‘PDSA worksheet’ into the search box.

Your three key data sources...

The Stepwise approach relies on using and integrating three key sources of routine data to establish the size, nature and cost of harm.

These are:

1. Your local incident reporting system (e.g. Datis)
2. Your Patient Administration System (PAS) or Electronic Patient Record (EPR).

You will be able to draw data from these systems with the help of your local health informatics team and finance team. The key is to be clear about what you are asking them for.
You starting point should be your organisation’s patient safety incident reporting system. The NPSA requires all trusts to collect and submit this data to the National Reporting and Learning System (NRLS) - a central database of patient safety incident reports. Every trust has software to help them do this (eg Datix). Your operational team members should be able to arrange access to the information you need. The important thing is to be clear what you are asking them for, at each stage of the work. Don’t be tempted to overcomplicate things.

The basic question to start with is:

Q: How many incidents of this harm have happened over the past x months/years in your whole organisation and/or a part of it (eg specialty, ward, department)?

It is worth going back far enough to ensure you can see any seasonal peaks and troughs in the harm data. If your harm is relatively infrequent then three years is a good timeframe for establishing a meaningful initial baseline.

1.3 Calculate the ‘rate’ of harm
Just knowing the total number of harm incidents will not be enough. It is very important to convert this crude number into a ‘standard rate of harm’ so that any subsequent rise or fall in the overall number of patients being treated in your hospital will not distort your harm data.

One way of doing this is to calculate your rate of harm per 1000 bed days using this simple formula:

\[
\text{Harm rate per 1000 bed days} = \frac{\text{A}}{\text{B}} \times 1000
\]

\[
\begin{align*}
\text{A: Determine the total number of patients who experienced the harm (in trust/unit) in a given month.} \\
\text{Source: Your local incident reporting system - eg Datix. This gives you your ‘A’ figure} \\
\text{B: Determine the total number of patient bed days (in trust/unit) in that given month.} \\
\text{Source: Your local corporate informatics team. This gives you your ‘B’ figure} \\
\end{align*}
\]

Example:

\[
\begin{align*}
\text{(A) 27 ÷ (B) 3000 = (C) 0.009} \\
\text{Then...} \\
\text{(C) 0.009 x 1000 = 9.0} \\
\text{Harm rate per 1000 bed days = 9.0}
\end{align*}
\]

1.4 Dig deeper for a more detailed picture
Although you will have now established your baseline – reliable figures against which you can measure future improvements – your data will be by no means complete. It’s now time to develop a more detailed ‘picture’ of the harm and this is a big opportunity not just to learn more about the problem and its possible solutions, but to make your data systems more systematic, reliable and relevant for the future.

You can do this by carrying out a bespoke data collection exercise. Most of the information you need should be available on your local incident reporting system, or can be retrieved through a patient notes audit. In the Stepwise pilot, the team at Wrightington, Wigan and Leigh NHS Foundation Trust agreed a list of specific questions which they used to collect the relevant data. These questions are similar:

Q: Which patients are experiencing this harm - eg elderly, very young?
Q: What time of day is the harm happening - eg lunch-time, evening, after medication?
Q: Where is it taking place - eg if falls, at the bedside, in the toilet, in the corridor?
Q: What interventions, if any, are already being used to deal with that harm?

Using the Global Trigger Tool
If you feel the harm has been under-reported in your organisation, you may want to consider using the Global Trigger Tool (GTT) methodology. It involves taking a random selection of patient case notes and systematically reviewing them for ‘triggers’ or ‘clues’ that identify adverse events or harm.

- Go to http://www.ihi.org/ihi and enter ‘Global Trigger Tool’ into the search box at the top of the page.
- For the UK acute version of the Global Trigger Tool go to: www.institute.nhs.uk/triggertool
1.5 Keep collecting, keep reviewing

Once you have agreed which questions you need to ask and which data sources will provide the answers, it's important to keep up the momentum and ensure your data is collected systematically and reviewed regularly, usually weekly or monthly. Obviously the frequency of these reviews depends on the frequency of the harm you are looking at. The important thing is to establish a simple and robust 'collection and review system' and stick to it.

This is an extract from the electronic falls data collection form developed during the pilot for prompting staff to capture a much wider selection of harm data. It is a systematic and simple solution.

1.6 Present your data simply and visually

There is broad agreement that healthcare professionals working on the frontline benefit greatly from data that is displayed visually and systematically. Therefore, it is worth thinking about how you will present your data 'picture' in a way that engages and influences others as your improvement work progresses. There are many ways you can do this, but for this work the litmus test is whether the frontline teams who are capturing the data and implementing the improvements understand and are motivated by what you are showing them. For this reason, it’s good to keep things simple and visual.

In-Patient Falls Data Form

Name: ____________________________
DOB: ____________________________
Sex: Female □ Male □
Date of admission: ____________________________
Diagnosis on admission: ____________________________
Past Medical History: ____________________________
Drugs on admissions: offending drugs: ____________________________
Risk assessment scored on admission: Low □ Medium □ High □
Falls risk care plan completed: Yes □ No □ NA □
Bedrails assessment completed: Yes □ No □ NA □
Date of fall: ____________________________
Time of fall: ____________________________
Location of fall: Ward: Haigh Bay: one
Staff levels: RN □ Untrained □
Injury sustained: nil □ other: ____________________________

This example shows how one of the Stepwise pilot wards collected data about where falls were happening on the ward. The different colour dots denote the month the fall occurred; their position show exactly where it took place (eg at the bedside, in the corridor).
Some other good methods of displaying data are bar charts, pie charts, simple Excel spreadsheets, and run charts. Your health informatics or quality improvement teams will be able to advise and help you with this – but the examples here show your approach does not have to be complicated; it just needs to be clear.

**Circumstances of falls**

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>fall while mobilising</td>
<td>32%</td>
</tr>
<tr>
<td>fall from bed</td>
<td>18%</td>
</tr>
<tr>
<td>fall circumstances unclear</td>
<td>10%</td>
</tr>
<tr>
<td>fall from chair</td>
<td>9%</td>
</tr>
<tr>
<td>fall from toilet or commode</td>
<td>28%</td>
</tr>
<tr>
<td>fall in bathroom or shower</td>
<td>18%</td>
</tr>
<tr>
<td>fall other</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Colour-coded pie chart:** this method of data display gets a lot of information over in one simple graphic.

**Find out more...**

- See Appendix B (page 35) to understand more about how patient safety information flows from both inside and outside a healthcare organisation. Understanding this will help you at each stage of the Stepwise process, from knowing who to include in your improvement work and which leaders and champions you might need, to knowing where and how to influence that flow of data with your own business case for quality and safety (Step 5).
Step 2: How to work out how much the harm is costing

Aim: Quantify each aspect of the harm

2.1 Establish the real cost of your harm

Once you have determined how much harm is happening in your organisation or a given part of it, you should then try to establish an accurate cost for the harm. This is a crucial part of the Stepwise process and, again, it can be done using a simple checklist and can often be drawn from routine data sources. There are four main cost categories that you will need to consider whenever harm you are focusing on. These are:

- **Staff time**
- **Extra length of stay in hospital**
- **Treatment**
- **Complaints, negligence and litigation handling.**

The next step is to establish the real costs against each of these categories. You can do this in a number of ways:

- Using existing sources: Often you’ll be able to use ready-made data from existing sources such as the Patient-level Information and Costing System (PLICS) and Healthcare Resource Group (HRG) data.
- Developing your own cost data: When the cost data you need is not available from ready-made sources, it is perfectly feasible to identify your own costs, using PDSA (Plan-Do-Study-Act) cycles to rapidly test your data source and/or cost assumptions. (See page 20 for more about using PDSA). This method has been used successfully by frontline teams piloting the Stepwise approach, helping to clarify, for example, staff time costs associated with harm from falls. (See the cost checklist overleaf).

2.2 A simple checklist to work out the cost of your harm

<table>
<thead>
<tr>
<th>Cost category</th>
<th>Factors to consider...</th>
<th>Actual cost per harm episode (£) (Falls costs shown as example)</th>
</tr>
</thead>
</table>
| **Staff time** (to deal with immediate harm episode) | Even minor harm episodes can use a significant amount of staff time – eg a minor fall = 20 minutes of nursing time to fill in incident report; 30 minutes to settle, assess and reassure patient. | Nurse time = £0.7/minute  
Doctor time = £1.05/minute |
| **Extra length of stay in hospital** | Either to treat or observe the patient. | £350/day |
| **Extra investigation(s)** – eg x-ray | eg x-ray, blood samples etc | x-ray = £30.75  
Full Blood Count (FBC) = £4.33 |
| **Treatment** | eg treating fracture, giving antibiotics and other medication | varied |
| **Additional visits (outpatient care)** | eg doctor, nurse time and further investigations etc | varied |
| **Complaints, negligence and litigation handling** | These costs can be significant, especially where they involve senior managers’ time and costly sick-leave cover or recruitment. They are not as easy to quantify, but it is important to factor them in. | varied |
| **Media time demands** | | |
| **Effect on staff morale (turnover, absenteeism)** | | |

Draw on the expertise around you

Remember to use the expertise around you. Much of the cost data you will be seeking is readily available to colleagues in your finance department. Your job is to be clear about what information you are asking them for.
2.3 How to use the PDSA cycle

Plan the next cycle
Decide whether the change can be implemented

Define the objective, questions and predictions
Plan to answer the questions (what? when? where?)
Plan data collection to answer the questions

Carry out the plan
Collect the data
Begin analysis of the data

Complete the analysis of the data
Compare data to predictions
Summarise what was learned

At the ‘plan’ stage you might be asking the following questions:
• What cost is related to (eg) inpatient falls, post fall?
• Can cost and quality outcomes be linked?
You might define your predictions as follows:
• There will be direct costs (investigation, treatment) and indirect costs (staff, litigation) involved.
• There will be wide variation depending on the type and severity of injury, the length of stay and treatment offered.
• It should be possible to collect information post fall events through case note review.
• It is expected that the project itself will create an opportunity for the IT, finance and quality champions to work together to develop a smart IT system for collecting information.

Step 3: How to find the interventions that will work best

Aims:
  a. Find out what’s causing the harm
  b. Find the evidence-based interventions that can prevent or minimise the harm

3.1 Find out what is causing your harm: carrying out a root cause analysis

Before you start to think about what solutions will prevent or reduce your harm, it is crucial that you identify what is causing that harm; what risk factors are at play?

In essence, you are doing a ‘root cause analysis’ – but this need not be a complex or drawn out process. Every harm is caused by one or more of the following three risk factors:
• patient risk factors
• environmental risk factors
• human (staff) risk factors.

To find out which risk factor, or combination of risk factors, is at the root of your harm, you need to ask the three key questions set out in the simple framework opposite. (This table uses falls as the example harm.) The regular meetings you have agreed with your operational team should give you ample opportunity to cover these questions.

### Root cause analysis: a simple framework

<table>
<thead>
<tr>
<th>Question</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Why do patients experience this harm?</td>
<td>eg did they fall because of poor vision, sudden low blood pressure?</td>
</tr>
<tr>
<td>2. Where does the harm happen?</td>
<td>eg was the patient’s water jug out of reach, was there poor lighting, slippery floors?</td>
</tr>
<tr>
<td>3. How do the actions of staff contribute to the harm?</td>
<td>eg are staff properly trained to use bed rails?</td>
</tr>
</tbody>
</table>
3.2 Identify what interventions will prevent or minimise the risk of harm
Once you have clearly identified which risk factors are causing the harm, you are ready to start thinking about which interventions you want to explore and test.

There are two main types of intervention you should consider:
• **BEFORE:** interventions to prevent the harm (e.g. screening questions to identify the patients at highest risk of the harm at the time of admission, or checklists to improve environmental causes resulting in harm)
• **AFTER:** interventions to mitigate the effect of the harm (e.g. clear protocols followed by all staff to deal with the harm after it happens).

The interventions you select will of course depend on the risk factors you have identified; i.e., whether you have identified single or multiple risk factors as the cause of your harm. But, before you can select them, you must first find them and there are several good sources you can use, including:
- **Patient Safety First:** [http://www.patientsafetyfirst.nhs.uk/](http://www.patientsafetyfirst.nhs.uk/) (see the ‘Interventions’ link at the top of the page)
- **NHS Evidence QIPP database of examples of good practice:** [http://www.evidence.nhs.uk/qipp](http://www.evidence.nhs.uk/qipp)
- **NHS Institute for Innovation and Improvement - examples of measurement of quality and cost:** [http://www.institute.nhs.uk/cost_and_quality/qipp/measurement_for_quality_and_cost.html](http://www.institute.nhs.uk/cost_and_quality/qipp/measurement_for_quality_and_cost.html)

3.3 How to do a literature search
If you can not find the right intervention(s) from the sources here, it is well worth doing a literature search to trawl the wider body of national and international evidence-based harm interventions. Most large health organisations will have a librarian who will be very experienced at doing these searches. Ask your librarian to do this for you and bear in mind that the more criteria you can give them for your search, the better the results will be.

For instance:
- “What interventions can prevent falls in an acute hospital setting?”

3.4 Developing your own solutions
When you have developed a clear understanding of the risk factors underpinning your harm and reviewed the existing evidence-based interventions that might help, you may still want to develop your own bespoke and cost-effective solution.

This is what teams at the Stepwise pilot sites at Wrightington, Wigan and Leigh NHS Foundation Trust (WWL) decided to do. By following the Stepwise methodology, the NHS Institute and pilot teams developed the TEAM RED multi-faceted fall intervention checklist shown overleaf.

The TEAM RED checklist was used alongside a number of other interventions (see box opposite) and has helped the Trust reduce falls by 18% over six months in the pilot wards.
TEAM RED checklist for fall prevention

The NHS Institute has designed a multi-faceted fall interventions checklist, covering both operational and strategic elements, to deal with the harm effectively. TEAM is the part of the checklist to help frontline ward staff.

<table>
<thead>
<tr>
<th>T (Toilet &amp; Mobility)</th>
<th>E (Environment)</th>
<th>A (Assessment)</th>
<th>M (Medication)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conduct start-of-shift huddle to identify patients at highest risk of falls.</td>
<td>1. Use RoomBed Readiness Assessment list between patient occupancy.</td>
<td>1. Identify all patients on offending drugs (agreed list).</td>
<td>1. Patients &amp; carers</td>
</tr>
<tr>
<td>2. Perform focused rounding on the patients and offer assisted toileting.</td>
<td>2. Have assistive aids (cane, walker), call bell and glasses within reach for the patient.</td>
<td>2. Add a tick box into the admission proforma to show the need for all prescribed medicine has been reviewed.</td>
<td>2. Staff</td>
</tr>
<tr>
<td>3. Include environmental checks during rounds.</td>
<td>3. Provide non-slip slippers/socks.</td>
<td>3. Follow Weekly Medication Review and adjustment protocol with help of pharmacist/doctor.</td>
<td>3. Trust Board</td>
</tr>
<tr>
<td>4. Co-ordinate with physiotherapists to integrate programs for muscle strengthening and balance.</td>
<td>4. Review lighting, coloured door handles and availability of emergency bells in high risk areas.</td>
<td>4. Nurses use ‘please review’ stickers, when needed.</td>
<td>1. Basic induction</td>
</tr>
<tr>
<td>1. Conduct start-of-shift huddle to identify patients at highest risk of falls.</td>
<td>1. Conduct start-of-shift huddle to identify patients at highest risk of falls.</td>
<td>1. Conduct start-of-shift huddle to identify patients at highest risk of falls.</td>
<td>1. Develop and integrate the safety (data), clinical (PAS) and financial (patient level costing) data electronically</td>
</tr>
<tr>
<td>2. Perform focused rounding on the patients and offer assisted toileting.</td>
<td>2. Perform focused rounding on the patients and offer assisted toileting.</td>
<td>2. Perform focused rounding on the patients and offer assisted toileting.</td>
<td>2. Improve data availability and accessibility to frontline staff</td>
</tr>
<tr>
<td>3. Include environmental checks during rounds.</td>
<td>3. Include environmental checks during rounds.</td>
<td>3. Include environmental checks during rounds.</td>
<td>3. Regular audits to review performance and update protocols</td>
</tr>
</tbody>
</table>

RED is the part of the checklist developed to help board members take strategic actions to sustain the impact of the fall reduction strategy and to build a safety culture throughout the organisation.

3.5 Aligning your interventions with existing governance arrangements

Whether you choose to implement existing harm reduction good practice interventions, modify these, or develop your own, it is important to ensure that you align these with your organisation’s own agreed clinical governance procedures. Every NHS organisation has quality improvement and safety policies, as well as clinical governance teams. Consult these as your starting point.

If you are working on a harm of national significance, eg falls, bed sores or thromboembolism, then there are national policies for you to link to; for instance the range of information and outputs produced by the QIPP National Safe Care Team.
Step 4: How to quantify how much each intervention will cost

Aim: Define the time and resources needed to achieve a 50% reduction in harm

4.1 Set yourself achievable goals

Before you start to think about what your chosen interventions will cost, you need to decide what size of harm reduction you want your interventions to achieve. Setting this at a realistic, affordable level is important. The well-known ‘10-100-10’ rule shows that achieving the last 10% of any improvement costs 100 times more than the first 10%.²

Aiming for a 50% reduction in harm is a sensible first goal:

Ask yourself whether the incremental cost of chasing the last few per cent is worth it?

In the Stepwise pilot, teams aimed for a 50% reduction in harm (falls). This initial goal was considered achievable but still capable of delivering a significant improvement in the quality of care. The Trust’s improvement business case outlined a potential for achieving a £120k saving by reducing falls by 50% over two years.

4.2 Calculate the cost of your interventions

It’s now time to work out what your chosen interventions will cost. You can do this using the same simple but systematic approach suggested in Step 2 when you calculated the cost of your harm. Cost each of your interventions separately.

<table>
<thead>
<tr>
<th>Cost category</th>
<th>Cost £</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Project management time</td>
<td></td>
</tr>
<tr>
<td>• Protected time cover</td>
<td></td>
</tr>
<tr>
<td>• Training</td>
<td></td>
</tr>
<tr>
<td>• Equipment</td>
<td></td>
</tr>
<tr>
<td>• Materials</td>
<td></td>
</tr>
<tr>
<td>• Equipment maintenance</td>
<td></td>
</tr>
<tr>
<td>• Ongoing training for new staff</td>
<td></td>
</tr>
<tr>
<td>• Audits</td>
<td></td>
</tr>
<tr>
<td>• Communication</td>
<td></td>
</tr>
</tbody>
</table>

Total cost of preventing 50% of the harm:

As long as you are clear about what costs you are seeking, your financial team and other senior colleagues will usually have ready access to the information you need.

Remember also your ongoing costs in addition to your start-up costs – ie the cost of sustaining your improvement.

See Appendix C (page 36) for a worked example of costs relating to a harm reduction project in Sweden.

Step 5: How to use your data to influence others

Aims: Build your business case for quality and safety

5.1 Make clear connections

By this stage you will have worked out the cost of your harm and the cost of the interventions that will deliver at least a 50% improvement. The next step is to make a clear, credible connection between what you will spend and what you will save – this is your ‘return on investment’ or ROI.

A simple way to calculate your ROI is the Benefit, Cost and Dividend (BCD) ‘cost, spend, save’ model. (If you’ve followed the previous steps, you will already have the data you need.)

| Benefits: | cost of the harm (and therefore how much you could save by reducing it) |
| Costs:    | costs of the improvement intervention(s) |
| Dividends:| saving that can be reinvested in quality services elsewhere in your organisation |

$$\text{£B} - \text{£C} = \text{£D}$$  
See Appendix C (page 36)

5.2 Tools to help you

One useful tool for capturing and calculating your dividend is the NHS Institute’s web-based Return on Investment Calculator.

While the calculator may not show all the elements of harm, or all the intervention costs you wish to include, you can customise it by adding more or different headings in the yellow fields. This means you could use the same headings and cost data you have collected in steps 2 and 4 of this guide.

Find the ROI Calculator within the ‘Quality & Service Improvement Tools’ produced by the NHS Institute at: http://www.institute.nhs.uk/roi
5.3 The ‘harm cost dashboard’

Using robust tools and methodologies to calculate and communicate your cost and harm reduction information is obviously a good way of engaging with clinicians and getting them on board with your patient safety work. This is especially helpful for Service Line Management (SLM) where clinicians are encouraged to manage their specialty as a distinct unit, with a clearer picture of how their service is working at both an operational and financial level.

The ‘harm cost dashboard’ was developed by the NHS Institute in collaboration with frontline hospital staff as part of the Stepwise approach. It is a good reflection of the ‘meeting of minds’ between clinical and financial leads and it has proven to be a powerful communication tool for engaging staff in the quality and cost agenda.

In particular the dashboard has:
• enabled clinical leaders to see harm cost (wasted resources) by individual service lines and specialties, take appropriate action on a regular basis and see the impact in a meaningful way,
• helped clinicians and finance managers work jointly towards the common goals of improving safety and reducing cost.

“The harm cost dashboard is a good reflection of the ‘meeting of minds’ between clinical and financial leads and it has proven to be a powerful communication tool for engaging frontline staff in the quality and cost agenda.”

The harm cost dashboard works across the trust’s existing information systems (eg Datix, PAS, PLICS) and turns data into ‘knowledge’. Note, the example here is a demonstration only and does not use real trust data.
You can expect your key audiences to change as your harm reduction work progresses. It’s likely that frontline staff, patients and carers will be your key target audience at this point – although your improvement teams, clinicians and senior managers will continue to need regular and timely updates.

5.4 Hearts as well as minds
While Stepwise is a methodology for improving quality and safety, like all other successful improvement techniques it will not work unless it captures and retains the imagination and interest of everyone who needs to be involved.

There is no one way of doing this but it is certain that you will need very strong leadership, visible and active clinical champions and a vibrant communication strategy. You will need to plan your communications carefully and creatively right at the start of your Stepwise programme and draw in as many different methods as you can to suit the different audiences you are hoping to influence. Look for the best opportunities to get your message across too.

• The information flow chart at Appendix A at the end of this guide will help you understand more clearly how harm information flows in and out of a healthcare organisation and therefore when the best opportunities might be to ‘piggyback’ on existing data reporting activities.

• Use real patient stories to bring your data to life (see box opposite). These can be a powerful way of bringing together the human and clinical cost of harm.

Patient story (July 2009)

History:
Mrs Smith, a 75-year-old lady, was admitted with pain in her left foot following a collapse at home.

Diagnosis and treatment:
Fracture, left ankle – internal fixation.


What happened next?
On 3 July, 2009, Mrs Smith fell while trying to put her headphones on the side-table before going to the toilet. She suffered a neck of femur fracture.

Actual discharged date, 18 July, 2009.

Impact:
• Distress, pain and impaired quality of life for the patient who had to stay in hospital an extra 14 days and be away from her loved ones for longer.
• Cost of additional treatment £7k.

Next steps... a journey, not a destination!
Stepwise is about understanding the size and cost of your harm problem. It helps to generate evidence that is based on your own true results and enables you to use that information to influence others and justify your case for quality and safety. It’s useful to understand the wider context in which Stepwise will need to sit and the three key improvement phases you’ll move through. The example here shows that your harm reduction efforts should not be seen as an isolated project, but rather as an initiative to promote safety culture in your organisation on an ongoing basis.

Phase 1: Diagnostic
Key activities might include...
• Establish the strategic and operational teams who will plan and implement falls initiative
• Agree and clarify ‘fall’ definition
• Review the trust-wide harm policies, screening tools and assessment plans
• Audit three-years’ retrospective harm data for trust
• Identify variables associated with chosen harm by reviewing existing paper-based and electronic data
• Identify evidence-based interventions which have not already been implemented.

Phase 2: Intervention
Key activities might include...
• Develop evidence-based interventions checklist (TEAM RED)
• Implement checklist in three pilot wards
• Ward teams to use new electronic form to collect comprehensive clinical and cost information on all new falls
• Calculate the actual direct cost through six-month prospective audit of new falls and develop an integrated electronic data system for cost and quality outcomes.

Phase 3: Spread, sustain, monitor
Key activities might include...
• Roll out TEAM RED checklist throughout whole hospital
• Develop frontline clinical champions to spread and sustain the initiative
• Identify other safety/quality issues which could benefit from the infrastructure you have built, avoiding duplication of effort
• Nominate non-executive director to champion the cause.

Raise awareness: Your communications strategy will need to span all three phases...
This chart shows how harm information flows within a trust, between both internal and external stakeholders. This example, prepared as part of the Stepwise pilot at Wightington, Wigan and Leigh NHS Foundation Trust, deals with falls – but it is relevant to other sorts of harm information.

### Appendix A: Fall Information Flow

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition adapted for patient falls incidents</th>
<th>Examples from reports to the National Reporting and Learning Service (NRLS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No harm</td>
<td>Where no harm came to the patient.</td>
<td>“No apparent harm”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“No complaints of pain, no visible bruising”</td>
</tr>
<tr>
<td>Low harm</td>
<td>Where the fall resulted in harm that required first aid, minor treatment, extra observation or medication.</td>
<td>“Patient says he has a sore bottom . . . .”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Shaken and upset”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“. . . grazes on right hand”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Small cut to finger”</td>
</tr>
<tr>
<td>Moderate harm</td>
<td>Where the fall resulted in harm that was likely to require out-patient treatment, admission to hospital, surgery or a longer stay in hospital.</td>
<td>“Sustained fracture to left wrist”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“One inch laceration above left eye, taken to A&amp;E for suturing”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Fractured pubic rami, put on 48 hours bed rest”</td>
</tr>
<tr>
<td>Severe harm</td>
<td>Where permanent harm, such as brain damage or disability, was likely to result from the fall.</td>
<td>“. . . following an x-ray a fractured neck of femur was confirmed”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: Up to 90% of older patients who fracture their neck of femur fail to recover to their previous level of mobility or independence.</td>
</tr>
<tr>
<td>Death</td>
<td>Where death was the direct result of the fall.</td>
<td>“Patient heard to fall from the commode hitting her head on the floor as she fell . . . bleeding from back of head . . . fully responsive but computerised tomography (CT) requested together with 15 minute neuro obs. Gradually Glasgow Coma Scale lowered . . . patient intubated and sedated and transferred to Intensive Care Unit (ICU) following scan. Patient died later the same day.”</td>
</tr>
</tbody>
</table>

### Appendix B: Falls Information Flow

<table>
<thead>
<tr>
<th>Falls Information Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward / Trust Location</td>
</tr>
<tr>
<td>Trust Patient Safety Team</td>
</tr>
<tr>
<td>Trust</td>
</tr>
<tr>
<td>NRLS</td>
</tr>
<tr>
<td>Royal College</td>
</tr>
</tbody>
</table>

- **Incident Learning Sub Group**
- **Learning established**
- **Trust Action Plans developed and process changed**
- **Form sent to Patient Safety Team**
- **Incident Details entered into Data**
- **Quarterly Report generated**
- **Trust Committee**
- **Royal College Audit**
- **NRLS Report and Action Plan received by Trust and falls department**
- **NPSA Reports and Action Plans generated**
- **NRLS National Reporting and Learning Service**
- **Royal College Audit**

It is useful to understand how patient safety data flows into the Board and other committees in your organisation. This way you can understand more clearly where you may be able to collect the right data from, and plan how you will feed your harm data back into the system to support your organisation.

### Appendix C: Bloodstream infection neonatal ICU (Sweden): BCD: Return on investment

_B = Potential benefit (cost of poor quality in €) for 24 patients/year

_C = Interventions cost (€) year one

<table>
<thead>
<tr>
<th>Items</th>
<th>Per patient</th>
<th>Per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra days in hospital</td>
<td>4000</td>
<td>960,000</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>1300</td>
<td>312,000</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>2000</td>
<td>480,000</td>
</tr>
<tr>
<td>Blood samples</td>
<td>460</td>
<td>110,400</td>
</tr>
<tr>
<td>X-ray (lungs)</td>
<td>480</td>
<td>115,200</td>
</tr>
<tr>
<td>Extra time for the staff</td>
<td>4300</td>
<td>1,032,000</td>
</tr>
<tr>
<td>Material</td>
<td>100</td>
<td>24,000</td>
</tr>
<tr>
<td><strong>Total cost of poor quality</strong></td>
<td><strong>12,640 €</strong></td>
<td><strong>3,000,000 €</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project leader, doctor 20% of FTE</td>
<td>20,000</td>
</tr>
<tr>
<td>Project group nurses and others</td>
<td>13,000</td>
</tr>
<tr>
<td>Staff involvement, education of 20 nurses</td>
<td>30,000</td>
</tr>
<tr>
<td>Cost for materials</td>
<td>7,000</td>
</tr>
<tr>
<td>Hygiene and infection control programme</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>Total cost of preventing 50% of the problem</strong></td>
<td><strong>170,000 €</strong></td>
</tr>
</tbody>
</table>

_D = Dividend (€) year one_

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total costs of poor quality</td>
<td>€ 3 million</td>
</tr>
<tr>
<td>Cost of 50% poor quality (Cost)</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Cost of interventions to reduce problem by 50% (spend)</td>
<td>170,000</td>
</tr>
<tr>
<td>Reduction in cost when problem reduced by 50% (save) = Total Savings</td>
<td>1,330,000 €</td>
</tr>
</tbody>
</table>

**Source:** Building the business case for quality and safety improvement projects (presented at the International Forum on Quality & Safety, 2008). By: M. A. Sachs, M. Lindh, J. Vanhala, L. Luthander (Stockholm County Council)
Acknowledgements:

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• QIPP National Safe Care Team
• The Institute for Healthcare Improvement (USA)
• Kaiser Permanente (USA).