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working for clinical professionals and
managers to make healthcare safer

Never?

This report, drawn up by the Clinical Human Factors Group, looks at nine wrong site surgery cases that were investigated last year, nine patients, nine families, nine clinicians and their teams all who thought it would never, could never happen to them.

It then examines how we can learn from these cases to ensure that next time it doesn't happen to you.

Never?

Acknowledgements & Foreword

The Clinical Human Factors Group, an independent group of clinicians, allied healthcare professionals, managers, academics and policy makers, have since 2007 been promoting a greater understanding of human factors in healthcare. An understanding of human factors, or ergonomics, allows organisations to optimise human performance so that people can be more efficient, safer and reliable. In short it's about making it easy to do the right things.

Clinical Human Factors/Ergonomics is defined as enhancing clinical performance through an understanding of the effects of teamwork, tasks, equipment, workspace, culture, organisation on human behaviour and abilities, and application of that knowledge in clinical settings. See www.chfg.org

In 2010 we helped initiate the Department of Health Human Factors Reference Group under the sponsorship of Prof Sir Bruce Keogh, Medical Director of the NHS. The role of this group has been to understand what we can do to start embedding human factors in the NHS. One key process we felt appropriate was to highlight the role human factors plays in healthcare disasters.

To this end, in 2011 we carried out a review of a selection of 'never events'. The review had a dual purpose for the Reference Group.

We wanted to help people understand how human factors has a real impact on patient safety, efficiency and the lives of patients and clinicians. This also meant introducing the language of safety in a way more familiar to other high-risk industry. And secondly we wanted to learn more about the process of helping healthcare learn from narrative, not statistical evidence.

This is a report of nine 'never events' from hospital trusts in England and Wales. The trusts agreed to share their findings from local root cause analysis (RCA) investigations to enable others to learn from these.

Susan Burnett from the Centre for Patient Safety and Service Quality at Imperial College London conducted the analysis and prepared the report. Joan Russell and Beverley Norris at the NPSA have been instrumental in liaising with the trusts and in helping to develop the human factors themes in the report. Rhona Flin, University of Aberdeen, contributed the section on nontechnical skills.

The report has been reviewed by the NPSA Surgical Safety Board for their comments on the lessons learned to ensure that these are in line with existing guidance.

The Clinical Human Factors Group

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Introduction

Having an operation or any invasive procedure is stressful enough and whilst there are risks of complications, we should be able to offer every patient a guarantee that the right procedure will be done in the right place on their body. Yet we can't offer this in the NHS. This is despite the Department of Health declaring wrong site surgery as a 'never event'. Never Events are definable, known sources of risk for which there is existing national guidance and/or safety recommendations on how the event can be prevented, there is support for implementation and as such should be largely preventable if the guidance is implemented (Department of Health, 2011). Last year alone there were 57 such cases reported. Why can't we offer such a guarantee?

We tolerate things going wrong in healthcare. Evidence suggests up to one in ten hospital admissions results in an adverse incident (Vincent et al, 2001); an incident rate that would not be acceptable in other industries. In order to move towards a more acceptable level of safety, we need to understand how and why things go wrong and build reliable systems of working. In this document we explore how approaches such as human factors (see www.chfg.org) can help us to make 'Never' a reality.

Here we look at nine wrong site surgery cases that were investigated last year, nine patients, nine families, nine clinicians and their teams all who thought it would never, could never happen to them. We will then look at how we can learn from these cases to ensure that next time it doesn't happen to you.

Case 1: Marsupialisation of the wrong Bartholin gland

An operation to relieve pain and swelling in a gland right next to the vagina was performed on the wrong side and the lady has to have the procedure done again on the correct side.

What happened?

- The site for surgery was not marked and although the 'WHO Surgical Safety Checklist' was used, the question 'is surgery site marked' was noted as not applicable
- The correct side was written in the notes and on the consent form but the notes weren't checked during Time Out
- The side of surgery wasn't recorded in the theatre system so it wasn't written on the board in theatres.

Case 2: The wrong patient had a knee procedure

Two patients with the same name were set up with one set of medical notes and hence the same hospital number. They had different medical conditions that had required hospital appointments in different departments. They both happened to have knee pain at the same time. The wrong patient arrived and had the procedure.

What happened?

- Four different hospital numbers were recorded in the medical notes, along with more than one GP and several different addresses
- The hospital uses patient identifier labels so one mistaken patient detail can be replicated many times
- An independent translator wasn't always available when either patient turned up for treatment for their different conditions
- Neither the consent form or pre-op assessment clinic form were properly completed.

Case 3: A stent was put in the wrong ureter (tube from the bladder to the kidney)

The patient was admitted to the Day Surgery Unit for a cystoscopy and to put a stent into the left ureter but instead it was inserted into the right ureter by mistake. She suffered pain afterwards and had several admissions to A&E before it was noticed and two further procedures before it was corrected.

What happened?

- The doctor who gained consent for the procedure from the patient was not present for the procedure
- The surgeon was pressured for time and didn't review the patient's notes or scans
- The side of the procedure was not marked
- The procedure is performed through the urethra and does not involve a cut in the skin. No one else in theatre except the surgeon can see the computer screen used for the procedure
- The surgeon injected dye into the right ureter which showed a degree of obstruction and on this basis the stent was inserted on the right and not on the left.

Case 4: The wrong knee was investigated via arthroscopy

A patient was scheduled for a right knee arthroscopy, seen by the consultant and the consent form filled in correctly, the right leg was marked but the procedure was carried out on the left knee until the theatre assistant noticed and spoke up. The procedure was stopped and the right knee investigated as required.

What happened?

- The person operating was not the same as the person taking consent and marking the site
- The site marking was not prominent or undertaken in accordance with policy
- The WHO Surgical Safety Checklist wasn't used in this theatre and there was no time out or verbal check of the site for surgery or position of the table before the procedure started
- The scrub nurse rotated the table for the left knee which caused confusion and set everyone up to think it was the left knee to be operated on. The nurse then left theatre and didn't return until the procedure was underway
- Additional theatre staff joined the team during the procedure but weren't briefed.

Case 5: The wrong lymph node was removed and the patient had to undergo a further procedure

The patient had skin cancer and noticed a swelling in their right groin. The referral letter described this to the surgeons and went on to say that an ultrasound scan had shown an enlarged external iliac chain lymph node which had been confirmed as metastatic melanoma by another test (FNA).

The surgical consultant circled the words 'right groin' on the letter and this term was used thereafter. The wrong site was operated on but on the correct side.

What happened?

- The term groin was interpreted differently by the oncologists and the surgeons
- The patient didn't have a detailed clinical assessment in the surgical clinic, the original referral letter and report of the ultrasound were not checked
- The ultrasound scan correctly identified the lymph node group but the cytology form incorrectly described it as being from the right groin
- The letter from the surgical team was sent to the patient's GP and not copied to the referring oncology team
- The skin MDT never discussed imaging so the scan was not reviewed at the meeting
- The scan results were not displayed at the time of the operation and it was recorded on the WHO Surgical Safety Checklist that imaging was not applicable.

Case 6: A patient had decompressive lumbar disc surgery on the wrong side

The patient had right-sided symptoms of sciatica consistent with recurrent disc disease. The patient was admitted and consented for a right far lateral L3/4 microdiscectomy and foraminotomy by the Neurosurgical SpR who marked the side for the surgery with a non-permanent board marker and not a surgical marker pen. The consultant was late to theatre having been at several management meetings from early morning. The consultant missed the final checking and started the operation without the SpR present. In preparing the skin the marks washed off and the surgeon put in a new line and proceeded to operate on the wrong side. When the error was noted the patient was still in the recovery area so, with their agreement, they were taken back to theatre and the correct procedure was performed.

What happened?

- The patient was seen by the anaesthetist and the SpR and they completed a local checklist and the first part of the WHO Checklist
- The patient was transferred to a different theatre from the one normally used which had a different layout and different positioning of the imaging screens
- The correct level of the L3/4 disc was confirmed using a needle and image intensifier but the imaging machine was in demand and had to be moved to another theatre once the level had been identified
- The consultant neurosurgeon arrived in theatre as the needle was being placed and both surgeons confirmed that it was placed on the left

- The Checklist was commenced while both surgeons were scrubbing for the procedure
- The SpR who had previously consented and marked the patient went and completed this while the Consultant continued to scrub, he couldn't hear what was being said
- As the SpR left the timeout to finish scrubbing the consultant neurosurgeon went into theatre to start the procedure
- The consultant effectively removed all signs of the markings with the skin prep fluid. A new midline mark was applied with an indelible marker relative to the needle used to check the level -the needle did not indicate the side for the procedure
- The SpR joined the surgery as the consultant made a midline incision and proceeded to perform the procedure on the wrong side, assisted by the SpR.

Case 7: A patient had a surgical implant inserted into his spine in the wrong joint – one below where it was supposed to be

The patient was for an interlaminar decompression procedure under a microscope with a titanium device inserted in L4/5. The device was actually inserted into L3/4 where there was also significant stenosis. The error was noticed before the patient left theatre so a second procedure was undertaken to place a second device in the correct L4/5 position. After the surgery, the patient fortunately reported being very happy with the outcome.

What happened?

- A metal device was held above the spine as a marker for identifying the correct level under X-ray control but once the X-ray machine was removed the device was not secured to the patient/bone. There is no standard identification or marking procedure for the spinal level under X-ray control
- The patient's MRI came from another hospital and it was noted that axial and vertical manipulations of images were difficult to review
- There does not appear to have been a timeout prior to the procedure.

Case 8: A patient had the wrong wisdom tooth extracted – upper right instead of upper left – under a general anaesthetic

The patient came in for day surgery to have his upper right wisdom tooth extracted under a general anaesthetic but the tooth on the upper left was extracted by mistake. The patient has had to have a second general anaesthetic to have the correct tooth removed.

What happened?

- The site was not marked in any way
- The surgeon and the scrub nurse did not check the consent form immediately prior to the procedure
- The procedure was not clearly defined on the theatre system
- The anaesthetic nurse announced the patient and the operation as the patient was taken into the operating theatre
- The patient's X-rays were displayed on the PACS system
- The staff reported feeling pressured by the surgeon that day to work quickly and there was an inexperienced circulating nurse on duty.

Case 9: An abdominal spacer for use in radiotherapy was inserted into a cancer patient on the wrong side

The young man was diagnosed with metastatic cancer arising in the left ileum which had spread to his lungs and bones. After chemotherapy treatment, radiotherapy was planned to the left ileum. A temporary abdominal spacer had to be inserted to position the patient's bowel away from the radiotherapy field to reduce radiation toxicity and to minimise any side effects. The spacer was inserted on the wrong side by mistake.

What happened?

- When booking the patient into theatre, the SHO used the wrong code that suggested excision of the ileum. The medical notes were not available for the surgical planning meeting
- The patient refused to sign the consent form as he knew he wasn't having his ileum removed. The SpR was called out of theatre to review the patient and agree with them the correct procedure. This was a busy day in theatre and the SpR was rushed
- The patient signed the consent form for the correct procedure but on the right side by mistake
- The SpR returned to theatre without marking the site. The side was marked after the patient was anaesthetised so couldn't correct this. The trust did not have a policy for marking surgical sites
- Confusion was caused by different uses of the abbreviation 'RT' which is used by the oncology team to refer to radiotherapy and by the surgeons to refer to the right side. Ileum RT meant very different things to the different medical teams
- Two MDT cancer meetings referred to different sides in the notes and two important letters which would have determined the correct side were yet to be filed in the patient's notes since they had deliberately been kept out for the surgeon to see.

Human Factors: learning from Never Events

“Human factors” uses knowledge on human behaviour in the design and operation of systems that are safe, effective and efficient. It is an established discipline in many high risk industries but it is still relatively new in healthcare. If our systems of work don’t match the way we work, such as the way we process information, or make decisions, we are setting people up to fail. Mistakes and errors are part of human nature, novice and expert alike; they are to be expected, and in some instances can be predicted. Safe, reliable systems are those which are based on an understanding of human error, which anticipate when things go wrong and build in suitable defences. For instance, common sense tells us that errors are highly likely when there are two patients on a ward with the same name, a new patient record system is being rolled out, there’s no writing space, and it’s the end of a busy night. Similarly, routine tasks that are done every day can be just as prone to error, as little attention is paid to the detail. A human factors approach means thinking realistically about how people work and prospectively assessing risk: for the mundane and as well the seemingly ‘high risk’. Most importantly, it is vital that a system’s overview is maintained; so that someone, somewhere, has an understanding of how all of the pieces of the jigsaw come together. In most high risk industries human factors is considered when new ways of working are introduced or when any change is introduced, to ensure the pieces fit together correctly. This is far from the case in healthcare, where we often find ourselves working with:

- equipment that doesn’t match our mental models of the way things work
- information systems that don’t allow us to access the data we need quickly and when we need it
- environments that are cramped or don’t have the equipment we need
- protocols that conflict with the practical ways of getting a job done
- colleagues who are used to different ways of working
- time pressures that force us to cut corners
- teams that don’t know each other and where there is conflict.

All of these can be improved if we think about human factors when designing our ways of working. This can be at a senior level: when implementing change; when clinical protocols are written; when equipment is procured; when information systems are designed; when ways of working and clinical environments are changed. It can also be used by staff on the frontline by understanding when errors are likely, by speaking up about concerns and using knowledge of the job to inform best practice.

Lessons from these cases

Some of the contributory factors common to these incidents are now discussed, and then a human factors analysis is presented.

Marking the site:

In seven of these cases, the site of the surgery was either not marked or not marked properly. The lessons here are:

- The operating surgeon should always be the person who marks the operative site
- Indelible ink surgical marker pens should be available everywhere in hospitals – especially in every surgeon's pocket. In two of these cases, the ink from a biro and a white board pen were washed off with the surgical prep for the skin prior to the incision
- Mark the side with some visible cue – as well as marking with an arrow, the procedure should be written on also. The lessons from these cases are that when the side cannot be marked on the skin then some other visual cue should be used – for example if the surgery is internal using a camera then the patient should have a mark on their ear or another part of their body that will not be covered with a drape during surgery
- Display the side for the procedure prominently on the board for everyone in theatre to see, especially when the side is not easily marked
- A standardised robust method should be agreed and always used to mark the site for spinal surgery
- Every theatre conducting spinal surgery or any surgery where the site is located using imaging techniques should have the required equipment available at all times. These cases show that when this equipment was needed elsewhere, pressure was put on the surgical teams to mark the site quickly causing errors to arise
- Never allow patients to be anaesthetised without the site marked or a visual cue being marked on the patient to indicate the side – anaesthetists should refuse to anaesthetise the patient in these cases.

Recognising the environmental factors:

These cases reveal the error provoking conditions that arise when cases are switched into other theatres with different layouts to where the surgeon usually operates. It may be that the display board for the procedure is not as visible, the table is a different way round in relation to other equipment compared to the usual theatre. Small changes that make quite a difference to how left and right are recognised and to how the team work. In one case here, the switch of theatre caused the surgeon to be distracted, worrying about whether the right equipment was available.

When there has been a move of theatre, extra care needs to be taken to orient the team and to brief and confirm the site and the procedure to be performed.

Whenever the theatre table is moved according to the side for the surgery, the possibility for errors is heightened, also when the patient is face down on the table.

In these cases visual cues are important, marking the site or side. In these cases, systems and routines can reduce the risks, for example grouping patients on a theatre list needing surgery on the same side so the table doesn't need moving; or agreeing the side for the surgery collectively prior to moving the table and cross checking with the notes – rather than one nurse having responsibility alone.

Time pressures heighten risks:

These cases show that when surgeons were rushed for time, the possibility of errors arose. In these cases often short cuts were taken which led to errors, in particular not conducting the checklist and timeout as intended or making the theatre team feel they had to speed up. Time pressures arose for many different reasons including:

- The need to attend a management meeting on another site before a theatre list, making the surgeon late
- The need to use the imaging equipment quickly because it was also needed in another theatre
- Workload, such that the surgeon did not have time to see the patient prior to surgery or to review the notes, they came straight into theatres from a meeting or a clinic and relied on colleagues and their memory of the patient for the procedure and the site.

Taking a timeout when unsure or there is even the slightest doubt...

Stopping and saying 'I'm not sure – please will you help me by checking...' would have avoided at least two of the errors described here. In particular where a procedure is done internally with the surgeon looking at a computer screen, some method of double checking the correct side has been located on the computer screen should be introduced. Even if the surgeon locates a problem such as a swelling or stenosis, if they are in any doubt about the side for the surgery, they should stop and check.

The importance of the Checklist:

The importance of using the WHO safe surgery checklist cannot be emphasised enough. These cases show that where this is seen by the surgeons as an unnecessary task to be 'ticked off' quickly, errors are not spotted early and people who have any doubts don't speak up. For example

in several cases here ensuring the theatre team – everyone in the theatre, including late comers - know the site, side and procedure would have prevented the error. The lessons here include:

- Say the site or side for the surgery out loud when going through the safe surgery checklist
- Those operating must be there and take full part in the final checklist before the procedure starts – indeed the person operating should conduct the final check of the side and site before proceeding
- If members of staff change during the procedure, new members should be introduced to the rest of the team
- A team brief at the beginning of the list ensures that all staff are in theatre and provides the opportunity for discussion on each case.

Staff changes, interruptions and distractions:

- Where members of the theatre team had to leave the theatre or when people joined after a case had started, errors arose. In one case here, the nurse set up the theatre for the procedure then left to do something else and wasn't present for the start of the case. In another, the surgeon arrived late and wasn't present during the checklist
- Staff breaks must be managed to ensure consistency in the team involved in the surgery. In particular those involved in setting up the case should be there at the start of the procedure.

Patient notes, computer records, coding and abbreviations:

Written and computer records played some part in each of these cases. What appear to be common abbreviations for left and right turned out to mean different things to different doctors – RT meaning radiotherapy to the oncology team for example. Even terms for parts of the body – 'groin' for example – meant different things to the patient and two different medical teams. This emphasises the need to spell out in detail the procedure, the site and the side in the notes and on any computers used in theatres. In one case the lack of a suitable theatre code led a doctor to use another that was wrong, for expediency.

The following lessons arise from these cases:

- Patients should have a clinical assessment by the surgical team, well documented, prior to surgery
- Don't plan surgery without the patient's notes

- All information available should be reviewed at an MDT, including imaging even if this is not routine
- File all correspondence relating to the patient and their procedure as soon as possible after receipt, don't keep certain information separate for long periods
- Circling words in a letter can perpetuate the use of certain terms as abbreviations for the full clinical condition, creating the potential for error, such as writing the wrong term on a form
- Check your theatre coding for cases where a code may not exist – can the procedure be written instead or does the doctor have to put in a 'similar' procedure code opening the way for the wrong procedure to be performed?
- If there are any discrepancies in the patient's notes, these should be checked out as they arise – someone should be tasked with making sure the address, date of birth and GP are correct. Where any confusion arises in the patient's notes, check and check again before proceeding. Correct any errors in the notes clearly and record that you have done this
- Where the potential for a mix up between patients is identified, for example people with similar names and addresses, a way of differentiating between them should be found, such as noting distinguishing features or attaching a photograph inside the notes
- Translators should be available to help in the pre-operative stage, to ensure the patient understands the procedure and that the consent process is dealt with thoroughly.

Lessons from the cases – a human factors analysis

A systems approach

These real cases show that incidents are often caused by multiple factors, including failures in attention, memory, decision making and prioritisation. These failures are made more likely, or have more serious effects, if the system in which we work is flawed. For instance: poor access to translation services will make communication or mis-identification errors more likely; management meetings that conflict with theatre scheduling will lead to time pressures and corners being cut; theatre layouts that mean the board isn't visible will make the information it provides redundant. It can be easy to see what goes wrong after the event; however, the real key to preventing future incidents is spotting the weak spots in our ways of working before they happen.

A human factors approach to safety can be used to help find those weak spots. One way of doing this is to use a systems' view of the way we work to look for things that can go wrong (Vincent et al 1998). The table to follow shows how this might work for the cases above.

Systems issue	What went wrong?
Equipment	<ul style="list-style-type: none"> • Poor planning meant imaging equipment needed in more than one place at the same time • Skin marking pens not always available; procurement and stock management failures • Theatre table design that means turning it round loses visual cues
Information, data and records	<ul style="list-style-type: none"> • Delays in patient records being filed • Multiple, pre-printed name labels meant any mistakes were perpetuated • Not all information available at MDT meetings • Abbreviations leading to errors – 'RT' and groin misinterpreted
Jobs/tasks/protocols	<ul style="list-style-type: none"> • Surgeons operating without having had time to see patients or read their notes • Management meetings or meetings on other sites conflicting with theatre times
Environment	<ul style="list-style-type: none"> • Working in theatres with different layouts – display boards not visible, table and equipment laid out the opposite way round
Work design	<ul style="list-style-type: none"> • The WHO Checklist seen as an added, unnecessary task rather than an integral part of process • Staff breaks and interruptions were not planned for
Culture and organisation	<ul style="list-style-type: none"> • Acceptance of time pressures causing shortcuts and failures to follow procedure • Hierarchies preventing staff speaking up or asking for help • Poor safety culture meant the checklist was seen as a burden rather than a tool for staff to protect themselves against errors
Communication	Staff – patient communication: <ul style="list-style-type: none"> • Issues with obtaining consent/patient involvement • Poor access to translator services
	Communication between teams and different staff groups: <ul style="list-style-type: none"> • Failures to speak up when checklist not followed • Lack of a double checking protocol when side for procedure is not obvious, e.g. when viewing on screen
	Between frontline staff and management: <ul style="list-style-type: none"> • Poor consultation on new ways of working
Organisation	<ul style="list-style-type: none"> • Unrealistic expectations of staff to cope with time pressures and workload

This sort of system model can also be used *prospectively* to help think about what might go wrong in the future. Healthcare is constantly changing and it is important to maintain this 'system' view of how the system might fail. There are a range of 'Prospective Hazard Analysis' tools available that can help manage risk in all sorts of settings, not just surgery. Failure Modes and Effects Analysis (FMEA) is a tool that is becoming more widely used in healthcare to manage risk.

Non-technical skills

Another human factors approach is to identify the non-technical skills that might have been implicated in these cases. Non-technical skills are 'the cognitive, social and personal resource skills that complement technical skills and contribute to safe and efficient task performance' (Flin et al, 2008, p1). These are also known as Crew Resource Management (CRM) skills, and are taught in a number of industries, such as aviation and nuclear power generation.

The key non-technical skills for surgical team members have recently been identified to design behavioural rating systems, e.g. NOTSS for surgeons, SPLINTS for scrub practitioners and ANTS for anaesthetists. In the examination of the reports of the 9 cases, an attempt was made to identify any areas where non-technical skills might have been improved, see the table below. There were also examples of good non-technical skills, such as the theatre assistant speaking up when he realised the site was incorrect.

Non-technical skill category	What went wrong?
Situation awareness	<ul style="list-style-type: none"> • Not gathering enough information • Confirmation bias • Not checking 'mental picture' with others • Overlooking anomalies • Not recognising increasing risks
Decision making	<ul style="list-style-type: none"> • Proceeding with task, rather than checking, when experiencing uncertainty • Over-reliance on assumptions as to correct location, e.g. encountering damaged tissue or pre-positioned patients
Teamwork	<ul style="list-style-type: none"> • Failures to speak up when checklist not followed • Inadequate exchange of information to ensure shared understanding • Management of resources e.g. too many present or support for less experienced team members.
Leadership	<ul style="list-style-type: none"> • Not demonstrating procedural compliance e.g. site marking, use of the checklist • Not ensuring whole team had shared awareness of task
Coping with stress	<ul style="list-style-type: none"> • Not dealing effectively with work pressures, • Requiring staff to work faster
Coping with fatigue	<ul style="list-style-type: none"> • Not mentioned in reports but not uncommon in clinical staff.

Things for you to think about and change

The following is a list of actions that could help prevent a Never Event such as a wrong site surgery. Some of these are actions for front line staff; others may need input from other parts of the organisation to be effective.

Pre-procedure:

1. Don't use abbreviations for right and left. RT might mean 'right' side to you, but it could have been written by an oncologist referring to 'radiotherapy'. Spell out the site and the procedure clearly in the notes and avoid general terms such as 'groin' that can be misinterpreted.
2. Make sure the correct procedure is on the theatre system and it is correctly coded. Where a code for a procedure doesn't exist, allow the doctor to type it in rather than using something similar.

In theatre:

1. Mark the site properly – use indelible ink and make the mark clear to everyone – don't anaesthetise the patient without the site being marked. If the mark washes off when prepping the skin, make another mark somewhere.
2. Use a robust method to mark the level for spinal surgery and the side.
3. The person who marks the site must be there at the start of the procedure and participate in the checklist.
4. If the patient is face down or the table has been moved to accommodate the surgery or you are using another theatre than the normal one, the risk of a mistake is introduced so take more care in these cases.
5. Use the checklist with everyone present, particularly the person who is going to start the operation or procedure – where there are shortcuts errors will occur.
6. Check the patient's notes and then display the site and procedure somewhere visible to everyone in theatre and say it out loud before starting.
7. Anyone arriving late into theatre when the patient is already on the table must be briefed about the procedure that is being carried out. If they are participating in the procedure they should read the notes before proceeding and confirm again with the team the side, site and procedure that is being carried out.
8. Don't proceed if you are unsure – stop and check the notes.
9. Where you are the only one who can see the screen for a procedure – such as in the ureter – take a time out to ask for a second check of the side of the procedure.
10. Wherever possible do the same site or side throughout the list so you don't have to move tables and kit.

11. The person who starts the operation should see the patient before the procedure – preferably they should be the one to take consent and mark the site.
12. Insufficient equipment such as image intensifiers in theatres can create error provoking conditions as surgeons rush to use the machines before they are taken off to another theatre.

In clinic:

1. If there are any discrepancies in the notes that may confuse patients' identities then speak up and get it checked out.
2. Get a translator when consenting patients.
3. Highlight the notes and records of patients with similar names whose identities may be confused – where possible use visual cues such as photographs.
4. Don't use general terms for areas of the body such as 'groin' – be specific.
5. Don't circle things in referral letters – it causes others to only look at this and they are likely to miss the other points.
6. Check that you have reviewed all clinical information in the MDT, especially if a patient is different and has had a scan reported, for example.

Other things to note:

1. If people are regularly late for clinics and theatre lists, timetables and commitments should be reviewed and changed. Being pressured for time can result in short cuts and errors.
2. If you are a surgeon in a senior management position you should lead by example and use the checklist as it is intended.

After an event:

Investigation and analysis of the event should collect information on not only the technical aspects of what went wrong but also human factors that may have contributed.

Using the human factors approach to improve patient safety

We've seen how failures in the system have led to wrong site surgery incidents. Many of these lessons can be used in other healthcare settings to improve patient safety. The following table illustrates how some of the system level issues highlighted here can be generalised to other settings:

Systems issue	Things you can do	
	Frontline staff:	Managers:
Equipment	<ul style="list-style-type: none"> • Get involved in procurement and make sure your views on what works and what doesn't are heard • Report any equipment that you feel is difficult to use and could lead to error – to your local clinical engineers, procurement and/or the manufacturer 	<ul style="list-style-type: none"> • Develop a 'purchasing for safety' policy to ensure equipment and devices in your organisation are safe for the context of use
Information, data and records	<ul style="list-style-type: none"> • Be vigilant for error traps – missing information, problems accessing data, delays in results, transcription errors, translation problems, information transfer between depts., patient identification, etc. 	<ul style="list-style-type: none"> • Are cross-hospital systems compatible? • Are new systems tested with users? • Consider electronic records as a way of reducing the risk of communication and errors
Jobs/tasks/protocols	<ul style="list-style-type: none"> • Make sure your voice is heard when new ways of working are being introduced; your knowledge of the job is vital to making sure safety is maintained 	<ul style="list-style-type: none"> • Consult all staff groups (not just the main users - what about central services, maintenance, porters?) and patients when designing new ways of working • Be realistic about the workability of new procedures – workarounds are inevitable if the process is inefficient

<p>Work design</p>	<ul style="list-style-type: none"> • Do you know if you are working beyond safe capacity? • Have workarounds become accepted? • Briefings and debriefings can help identify safety issues 	<ul style="list-style-type: none"> • Are time pressures and workloads compromising safety? • Is contingency planning in place for emergencies, staff shortages, infection outbreaks etc. • Ensure all staff are briefed and have access to any necessary training when new practices are introduced
<p>Environment</p>	<ul style="list-style-type: none"> • Do you have to do the same work in different environments? Be aware of any differences that might lead you to make mistakes and refer these up to managers • Is your workplace is used by lots of different staff? Are they all able to do their job safely and efficiently or is it aimed at just one staff group? 	<ul style="list-style-type: none"> • Try to ensure consistency in working environments in terms of layout and equipment • How is building work and maintenance managed?
<p>Culture and organisation</p>	<ul style="list-style-type: none"> • Speak up when you are concerned or see something that is worrying • Do not be afraid to challenge other's behaviours • Suggest team working activities if you feel your team isn't working safely 	<ul style="list-style-type: none"> • Use multidisciplinary training to ensure cross organisation understanding of language, abbreviations, ways of working, to challenge hierarchies etc • Executive walk-arounds can be an effective tool in improving safety culture • Ensure effective implementation of safety interventions (such as the WHO surgical checklist) and follow up to ensure they are fully adopted
<p>Communication</p>	<ul style="list-style-type: none"> • Document any differences in communication between staff groups or departments that could lead to error • Consider using structured communication tools eg SBAR 	<ul style="list-style-type: none"> • Ensure staff are given time to participate in team development activities

In conclusion

Here we have summarised the key points and the lessons from nine very different 'never' events. There are common themes and something for everyone to learn from, in particular how easy it is for a wrong procedure to take place despite everyone's best efforts. These human and organisational factors may be worth considering when you next conduct a risk assessment or an incident investigation.

There is clearly much more work to do to improve reliability in the NHS. Japanese companies have long been admired for their work on reliability but whilst many hospitals and healthcare providers have adopted lean methods and principles, none have adopted these as such a key element of their culture. These cases reveal how a casual attitude towards initiatives to improve reliability can fail – such as marking the site with a biro rather than a permanent marker pen or going through the WHO safe surgery checklist when the operating surgeon isn't present. The cases also demonstrate that we need to improve teamwork and communication in hospitals if 'never events' are never to happen again.

The purpose of presenting these cases is to enable the lessons to be learned, for everyone involved in treating patients to reflect and consider if this could happen to them and to make improvements, so please share this report with your colleagues and use it to discuss practice in your organisation.

References

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