

A Focus on

# Human Factors



**Share2  
Care**



# Why is human factors an important topic?



Human Factors, often referred to as ergonomics, is an established scientific discipline used in many safety-critical industries, such as airlines and oil.

Every day in the NHS, tens of thousands of patients are treated safely by dedicated healthcare professionals who are motivated to provide high quality and safe clinical care. For the vast majority of patients, the treatment they receive alleviates or improves their symptoms and is a positive experience. However, an unacceptable number of patients are harmed as a result of their treatment or as a consequence of their admission to hospital.

A failure to apply human factors principles is a key aspect of most adverse events.

**~“In healthcare 80% of errors are attributed to human factors at individual level, organisational level, or commonly both.”~**

(National Patient Safety Agency, 2008)

Understanding the importance of Human Factors, and how its concepts can be applied by individuals and teams is fundamental to improving patient safety.

## What is Human Factors?

Human Factors encompasses all of the factors that can influence the behaviour and performance of human beings in a system. It allows us to understand how people perform under different circumstances and why errors happen.

**“Enhancing clinical performance through an understanding of the effects of teamwork, tasks, equipment, workspace, culture and organisation on human behaviour and abilities and application of that knowledge in clinical settings”**

(NHS England, 2013).

This issue of Share2Care aims to improve awareness of Human Factors and the role you can play in increasing patient safety. Please note, the case studies within this issue did not occur at ELHT but illustrate that severe incidents can occur anywhere, to anyone, at any time.

## Opening the Door to Change (2018)

In December 2018, the Care Quality Commission (CQC) published a report entitled “Opening the Door to Change” which examines the issues that contribute to the occurrence of Never Events and wider patient safety incidents.

Never Events are serious incidents that are considered to be wholly preventable. However across the NHS, there were 468 incidents classified as Never Events between 1 April 2017 and 31 March 2018.

**~“96% of Never Events reported in 2017/18 should have been preventable with regular actions by humans”~**

(CQC, 2018)

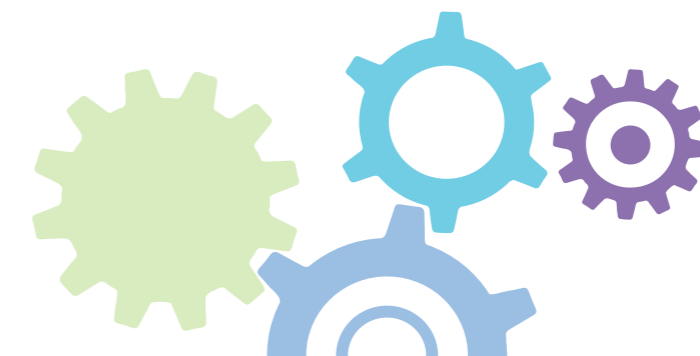
According to the CQC report, too many people are being injured or suffering unnecessary harm because NHS staff are not supported by sufficient training, particularly around Human Factors, and because the complexity of the current patient safety system makes it difficult for staff to ensure that safety is an integral part of everything they do.

Although healthcare is by its nature ‘high risk’, the review found that due to increasing pressures within the NHS, this is not consistently reflected in its culture and practice. The CQC is calling on the NHS to promote a change in safety culture so that safety is given the priority it deserves.

For more information: The full report is available to download on the CQC website: [www.cqc.org.uk](http://www.cqc.org.uk)



**~“NHS staff do a remarkable job to keep patients safe. But despite their best efforts, never events and other patient safety incidents continue to happen. In theory these events are entirely preventable: in practice too many patients suffer harm”~**  
(Professor Ted Baker, Chief Inspector of Hospitals, 2018)





# Errors and Incidents

~“We all make errors irrespective of how much training we possess or how motivated we are to do it right”~

(Health and Safety Executive, 1999)

Healthcare professionals are human beings and, like all human beings, are fallible. In our personal and working lives we all make mistakes in the things we do, or forget to do, but the impact of these is often non-existent, minor or merely creates inconvenience. However, in healthcare there is always the chance that the consequences could be catastrophic.

Understanding Human Factors helps us build better defences into our systems in order to prevent or reduce the likelihood of serious error resulting in harm to a patient by:

- Allowing us to understand why we make errors
- Improving our safety culture within teams and the organisation
- Enhancing teamwork and communication
- Identify “what went wrong”
- Helping us predict “what could go wrong” in the future
- Improving the design of the system/processes we work in

## Human Factors ‘Dirty Dozen’

The ‘Dirty Dozen’ refers to twelve of the most common factors that influence people to make mistakes and errors that can potentially lead to harm (Dupont, 1993)

- 1 **Communication**
- 2 **Distraction**
- 3 **Lack of resources**
- 4 **Stress**
- 5 **Complacency**
- 6 **Lack of teamwork**
- 7 **Pressure**
- 8 **Situational awareness**
- 9 **Lack of knowledge**
- 10 **Fatigue**
- 11 **Lack of assertiveness**
- 12 **Cultural Norms**  
“the way we do things around here”

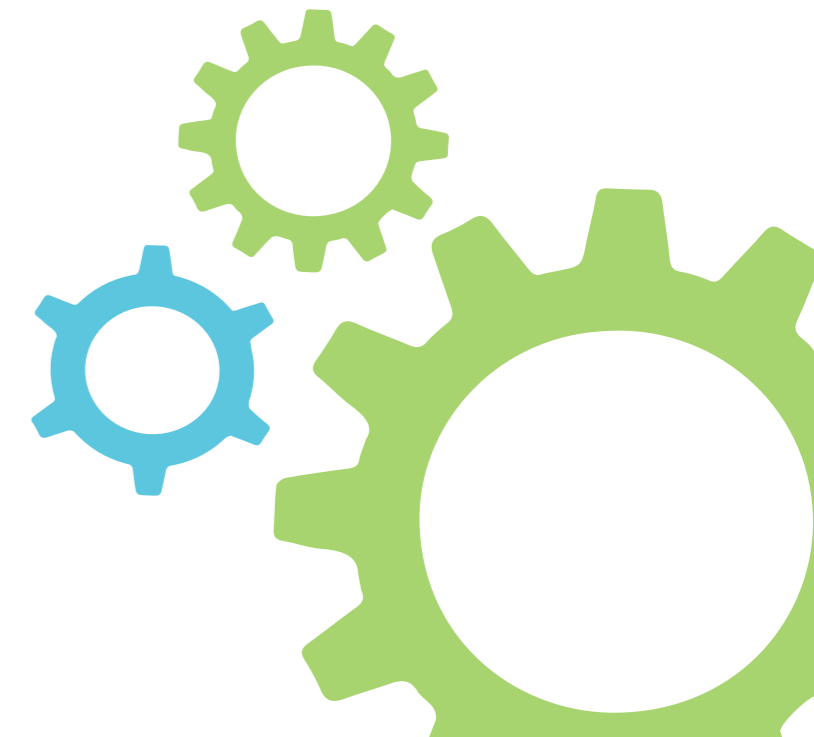
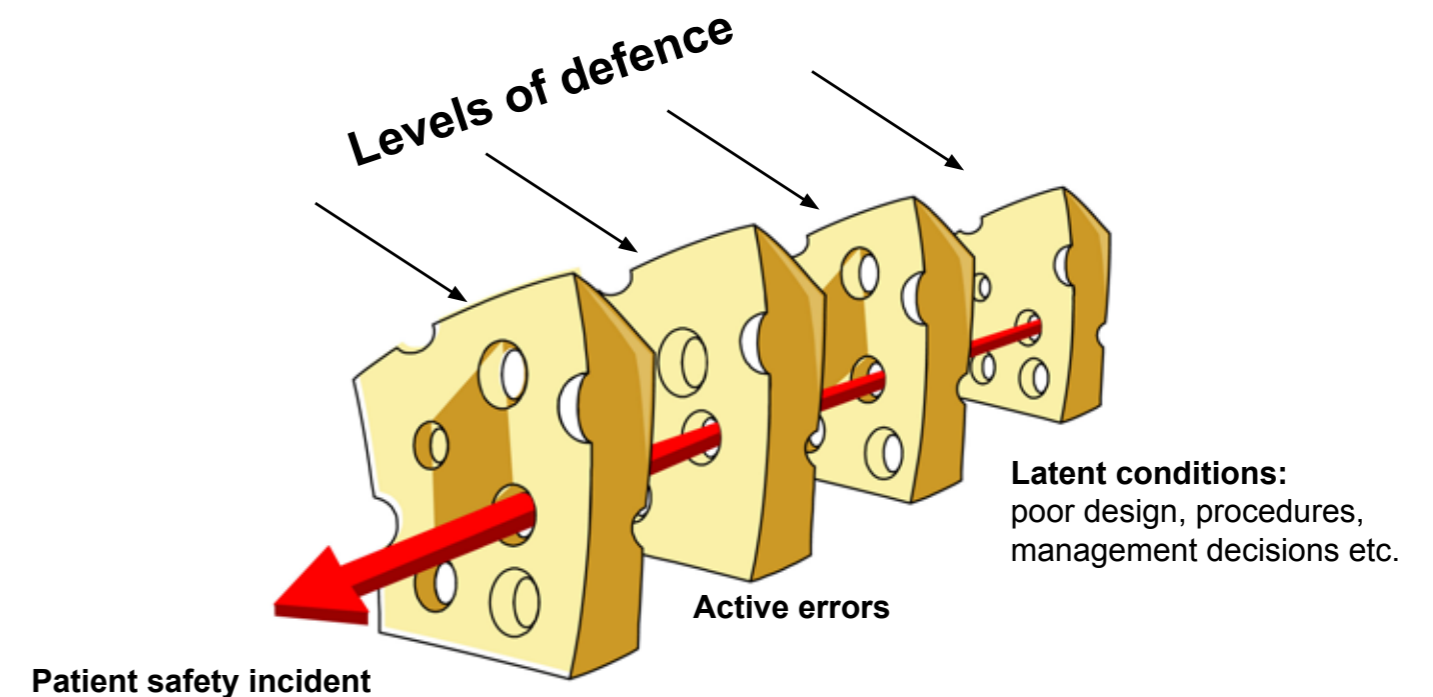
## The Swiss Cheese Model

(Reason, 1990)

In any system there are many levels of defence (for example checking of drugs before administration, a pre-operative checklist or marking a surgical site before an operation). Each level of defence has little ‘holes’ (latent conditions) which are caused by poor design, decision-making, procedures, lack of training, limited resources, staffing levels etc.

If these holes become aligned over successive levels of defence, they create a window of opportunity for a patient safety incident to occur. Latent conditions also increase the likelihood that healthcare professionals will make ‘active errors’ (for example whilst delivering patient care).

When a combination of latent conditions and active errors causes all levels of defences to be breached, a patient safety incident occurs.





## Case study 1: just a routine operation

Elaine Bromiley was a fit and healthy young woman who was admitted to hospital for routine sinus surgery. During the anaesthetic she experienced breathing problems and the anaesthetist was unable to insert a device to secure her airway. After 10 minutes it was a situation of 'can't intubate, can't ventilate'; a recognised anaesthetic emergency for which guidelines exist.

For a further 15 minutes, three highly experienced consultants made numerous unsuccessful attempts to secure Elaine's airway and she suffered prolonged periods with dangerously low levels of oxygen in her bloodstream. Early on nurses informed the team that they had brought emergency equipment to the room and booked a bed in intensive care but neither were utilised.

Thirty-five minutes after the start of the anaesthetic, it was decided that Elaine should be allowed to wake up naturally and was transferred to the recovery unit. When she failed to wake up she was then transferred to the intensive care unit. Elaine never regained consciousness and after 13 days the decision was made to withdraw the ventilation support that was sustaining her life.

### Key Learning

On the surface this could appear to be a tragic but unavoidable event resulting from an unexpected but recognised complication of anaesthesia. However, the outcome could have been quite different if Human Factors had been taken into account by everyone involved. Every member of the team treating Elaine was experienced and technically highly competent, yet the series of events and actions still resulted in her death.

A detailed investigation highlighted some of these factors:

#### Loss of situational awareness

The stress of the situation meant that the consultants involved became highly focussed on repeated attempts to insert the breathing tube.

As a result of this they lost sight of the bigger picture i.e. how long these attempts had been taking. This 'tunnel vision' meant they had no sense of time passing or the severity of the situation.

#### Perception and cognition

Actions were not in line with the emergency protocol. In the pressure of the moment many options were being considered but they were not necessarily the options that made the most sense in hindsight.

#### Teamwork

There was no clear leader. The consultants in the room were all providing help and support but no one person was in charge throughout. This led to a breakdown in the decision making process and communication between the three consultants.

#### Culture and assertiveness

Nurses, who sensed the urgency early on, brought the emergency kit to the room, and then alerted the intensive care unit. They stated that these were available but did not raise their concerns aloud when they were not utilised. Other nurses who were aware of what was happening did not know how to broach the subject. The hierarchy of the team made assertiveness difficult despite the severity of the situation.

### Raising Awareness

As a result of this incident, Elaine's husband, Martin Bromiley has been continuously raising the profile of the importance of Human Factors in healthcare and is the founder of the Clinical Human Factors Group – a charity working to make healthcare safer.

For more information: <https://chfg.org/>

**Watch:** A full video of 'Just A Routine Operation' is available on You Tube

**Source:** NHS Institute for Innovation and Improvement (2013)





# Key Components of Human Factors

## Organisational Safety

~“Culture can be best understood as “the way we do things around here”. An organisation’s culture will influence human behaviour and human performance at work.

**Poor safety culture has contributed to many major incidents and personal injuries.”~**

(HSE, 2018)

Organisational safety is a high priority for the Trust. In order to ensure we have an excellent safety culture, it is important that:

- Our systems are designed to help us do our jobs whilst keeping patients and staff safe
- The working environment is fit for purpose
- The correct equipment is available and in good working order.

The main characteristics of a safety culture are:

- **Open:** Staff feel comfortable discussing patient safety issues and raising concerns with colleagues and senior managers
- **Just:** Staff, patients and carers are treated fairly, with empathy and consideration when they have been involved in an incident or have raised concerns about safety standards. There are clear guidance for behaviour that is unacceptable.
- **Reporting:** Staff are able and feel confident in reporting incidents and near misses
- **Learning:** We learn from safety lessons and share this learning across the Trust
- **Informed:** The Trust has learned from previous experience and works hard to identify and mitigate future harms.

## Team Resource Management (TRM)

TRM is about the study of how we interact with individuals and teams, and how our behaviour can impact upon practice and safety. The key elements that impact on our work are:

- **Communication:** The importance of having effective communication in our day to day work activities. It helps us build a team with a common cause and improves decision making.
- **Leadership:** Leaders who have the ability to influence, inspire and direct actions to attain a desired objective.
- **Followership:** The ability or willingness to follow a leader, take direction, be part of a team and to deliver what is expected of you.
- **Situational Awareness:** Understanding of what is happening around you, what others are doing and what will happen next.
- **Anticipation and Planning:** The ability to identify potential needs, and prepare both equipment and environment to enable efficient delivery of patient care
- **Distribution of Workload:** Appreciating what causes an increase in workload and the implications that an excessive workload can have on us and our behaviour.
- **Error Recognition:** The ability to recognise when an error could be happening and caution should be applied to reduce the risk

~TRM aims to “develop positive attitudes and behaviours towards teamwork skills and human performance ... helping to reduce the number or minimise the impact of teamwork related errors.”~

(Eurocontrol)



## Case Study 2: Controlled Drugs

“Some years ago they made Temazepam a controlled drug. This meant that every time I had to give it, I had to lock up the drug trolley, wait for a colleague to come with me, both of us take the prescription cart to the drug cupboard, count the tablets in the bottle, take out the dose, fill in the book, go and check the identity of the patient and prescription again together and then give it.

On my ward, we often had up to 12 patients needing Temazepam so suddenly the evening drug rounds were taking forever! The drug cupboard was right at the other end of ward. In the end we started taking the bottle out of the drug cupboard at the start of the round and putting it in our pocket.

We’d then just fill out the book as we went along; we had to check all the controlled drugs later in the night anyway. We all knew we were doing it wrong but it just seemed crazy trying to do it the right way when we were so busy and the reason for changing the policy seemed to be more about it needing to be counted to prevent abuse rather than it presenting a risk to the patients.”

### Key Learning

In this example we see evidence of why staff may deliberately flout the rules:

#### There is a perceived benefit

Less trouble for the staff, saves time, reduces distractions while doing the round.

#### Assumed absent or minimal consequences

Staff do not consider it likely there will be negative effects for the patient or consequences for themselves. The process or rule may not appear to have value.

The greater the benefits and lower the likely consequences, the more common it is for people to ‘migrate’ towards working in ways that they know to be wrong or that break the rules.

Over time these ways become normalised and are integrated into the culture – “This is how we do it here”.

Source: Patient Safety First (2009)

# How is 'Human Factors' being used within the Trust?

*~Moving the focus of investigations undertaken in the Trust from "who did" to "why did" the incident occur~*



## Incident Investigations

- Introduction of Round Table de-brief discussion after a serious incident that provides a safe space for staff to have an open and transparent discussion about the incident, so they can understand what happened, why it happened and what could they change to improve safety.
- Moving the focus of investigations undertaken in the Trust from "who did" to "why did" the incident occur. Allowing us to improve safety by developing safer systems which are there to protect patients and staff.
- The solutions developed in response to incidents are being developed and owned by the teams involved, making it more likely that they will work
- Sharing the learning from incidents across the Trust in a number of different ways (e.g. Share to Care bulletin and meetings, posters, forums etc).
- Development of "Root Cause Analysis Training" for senior managers and the "Introduction to Human Factors" course which is available to all staff.

## Quality Improvement

There have been a number of quality improvements programmes on the back of incident reporting and investigation, including:

- Changes to the Nasogastric feeding bundle to stop routine x-ray checks overnight to eliminate human error caused by fatigue
- The development of new pathways for dermatology patients requiring care following a serious in-patient fall.
- The introduction of nursing and porter checklists every time patients are moved from a ward.

## Thinking Innovatively About Distraction: 10,000 Feet

In January 2018, the Trust introduced the "10,000 Feet" concept for surgical staff.

Based on the 'Below Ten Thousand' concept developed in Australia, when any member of the surgical team find that noises and distractions are affecting their performance, staff can use the trigger phrase "10,000 Feet" to allow staff the time and space to do their job safely. This could be, for example, when patients are to be extubated and the anaesthetist needs to focus.

Following its implementation, we have seen that:

- Junior members of the surgical team (including students) feel more empowered to speak up.
- Staff have more awareness and education about how noise and distraction is detrimental to patient safety.
- Staff are more aware of the need for "below ten thousand moments". In particular, at Time Out and Sign Out, staff now recognise that these are the 'slowing down' moments that require teamwork for effective implementation.
- Everyone has control of the environment and confidence in calling "10,000 Feet" if at any point they feel that noise and distractions are impeding on patient care.





# Simulation Training

The Education Directorate have developed simulation training and offer regular sessions, designed to recreate real-life patient scenarios, across all specialities. Key concepts of Human Factors, such as situational awareness, communications, leadership and teamwork, are interwoven into the training.

Some examples include:

## Maternity

A 'Lucinda' doll simulation trainer was purchased using money from Health Education England's 'Better Training, Better Births' fund. This enabled the Midwifery Practice Educators to provide simulation training for NICU with locality-based scenarios with a MDT approach.

## Theatres

Teams in theatres have utilised the offer of in-situ simulated learning to reinforce their awareness around Human Factors. Simulations have taken place in anaesthetic rooms, recovery and theatre, using an MDT approach with multi-professional teamworking. Theatres are also using simulations to learn from patient safety incidents whereby teams involved can re-create the incident within the environment and unpick the learning from the scenario.

## Emergency Department

In response to feedback from ED staff and NNAS, regular MDT simulation training sessions look at the sterile cockpit of handover and the receipt of specific patient groups.

## Assistant Practitioners

Simulation training has been provided to Assistant Practitioners in order to support them in undertaking the role of second checkers so patients receive medication in a safe manner.

## For more information

Please contact your Practice Educator or the Education Department.



## Case Study 3: Retained Foreign Object Post-Procedure

A 55-year-old man was admitted to hospital for elective (non-emergency) liver surgery. At the beginning of the surgery, the team completed an initial count of all the swabs and instruments to be used in his operation, which was then written on the white board in the operating theatre, as per safety guidance.

During the surgery a total of five abdominal swabs were used. Two abdominal swabs were used in the first instance (one to clean the surgical site and another for blood) and placed in a bowl after use. A further three abdominal swabs were placed under the liver to lift the liver up so that the surgeon had better access to it, of which the team were informed.

At the end of the operation just before the team closed the abdomen, the team completed another count. A number of smaller swabs (some clean and some used) were counted in to the bowl on top of the two abdominal swabs already in the bowl.

The two abdominal swabs were not removed from the bowl and therefore not seen during the pre-closure count, as a result it was thought that there were actually five abdominal swabs in the bowl and so five were crossed off the white board. The surgical wound was closed and the final count performed (which counts only those swabs that had not previously been counted). The three abdominal swabs were not identified as unaccounted for and were left behind in his abdomen when it was closed. They were identified a few days later following an x-ray and the patient needed a further operation to remove the swabs. He made a full recovery but was in hospital for a week longer than necessary.

## Key Learning

This type of incident is preventable because healthcare providers are expected to carry out specific counting and checking procedures as specified by safety guidance (for example National Safety Standards for Invasive Procedures - NatSSIPs). These standards support safe and consistent practice in accounting for all items used during invasive procedures and in minimising the risk of them being retained unintentionally.

A local investigation identified the following issues:

- **Not following policy**  
There was a Trust policy for counting items during the procedure, but that this was not completely followed.
- **Variation in practice**  
Swab counting across the organisation varied and there was no clear guidance about what should be included in the count.
- **Complacency:** There was a belief that the abdominal swabs were too big to be left inside the abdomen unintentionally
- **Inexperience and distractions:** The team concerned were relatively junior and the investigation identified several interruptions that occurred during the swab counting process.

Source: CQC (2018)



# Would You Like To Learn More About Human Factors?

The CQC report states that 96% of Never Events could have been prevented if more attention had been paid to Human Factors.

*“Everyone can play a part in making patient safety a top priority. But there is a wider challenge for us all to effect the cultural change that we need, to have the humility to accept that we all can make errors – so we must plan everything we do with this in mind”.*

(Professor Ted Baker, 2018)

## What does this mean in practice?

To find out more, why not attend our 1-day training course: Introduction into Human Factors?

This course is designed to help staff gain an understanding of Human Factors approaches and how to apply these to help improve safety within our workplace.

It will help you gain a greater understanding of:

- The principles of Human Factors and why errors occur;
- The relevance of Human Factors to the improvement of quality and safety in healthcare;
- Human Factors as a ‘way of thinking’ about every day work and how it relates to patient care;
- How to identify potential Human Factors errors and ways to mitigate them to improve patient safety in your own areas;
- How the culture we work in influences the care we give;

The training is suitable for staff that are new to the concept of Human Factors as well as those who would like to refresh their existing knowledge.

To Register: For dates, times and details of how to book, please visit the Learning Hub.



## Patient Safety Alert

NHS/PSA/W/2016/011

### ‘Risk of severe harm and death due to withdrawing insulin from pen devices’

The above Patient Safety Alert was originally issued by NHS Improvement in November 2016.

At ELHT, the contents of this alert were discussed at Patient Safety and Risk Assurance Committee, where a nominated lead was selected to co-ordinate a response which was subsequently uploaded onto the Central Alerting System (CAS).

After reviewing the response and assurance, it appears that the alert was only shared with clinicians linked to the Diabetes Team. We need this alert to be cascaded to all clinical staff involved in the administration of insulin.

### Key Learning:

“Communication often appears at the top of contributing and causal factors in incident reports, and is therefore one of the most critical human factor elements” (Dupont, 1993).

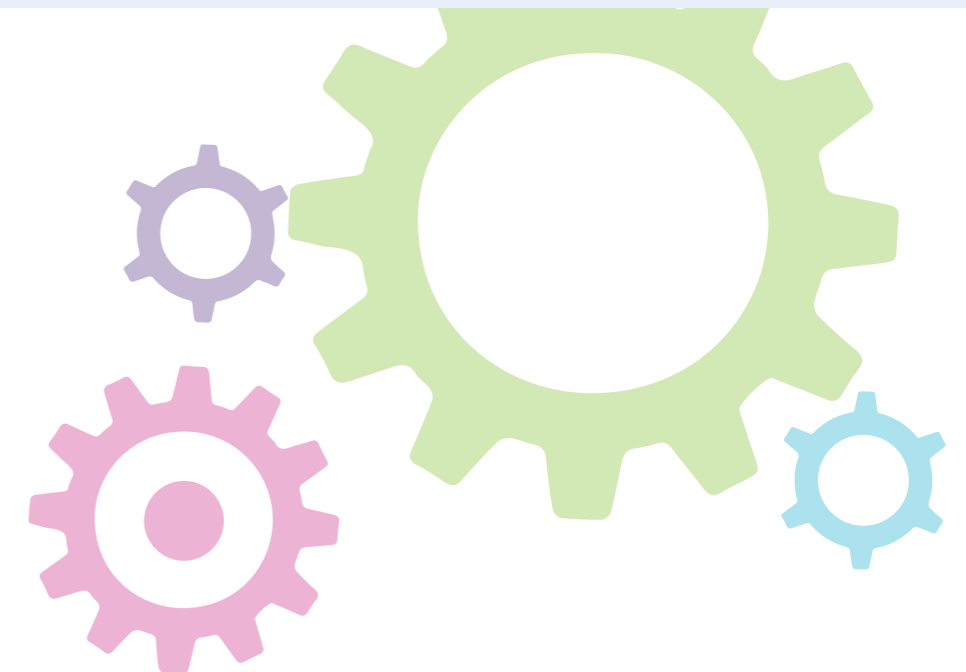
### What Can I Do?

Please can ALL staff potentially involved in the administration of insulin read a copy of this alert?

### Where Can I find a copy

On the NHS Improvement website:

[https://improvement.nhs.uk/documents/510/Patient\\_Safety\\_Alert\\_-\\_Withdrawing\\_insulin\\_from\\_pen\\_devices.pdf](https://improvement.nhs.uk/documents/510/Patient_Safety_Alert_-_Withdrawing_insulin_from_pen_devices.pdf)







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