Enhanced Significant Event Analysis
A Human Factors System Approach for Primary Care

www.nes.scot.nhs.uk/shine/
About the Module

- The module is a very basic ‘read and click’ introductory e-learning tool.
- The purpose is to quickly raise awareness amongst the primary care workforce and others of Enhanced SEA and related topics such as basic Human Factors and Error Theory.
- It was developed by NHS Education for Scotland, with support funding from the Health Foundation SHINE 2012/13 programme.
- NHS Education for Scotland (NES) is a special health board responsible for supporting NHS services in Scotland by developing and delivering education and training for those who work in NHSScotland - http://www.nes.scot.nhs.uk/
- The Health Foundation is an independent charity working to improve the quality of healthcare in the UK - http://www.health.org.uk/

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Learning Outcomes

After completing this module you should be more informed on:

• Basic human factors principles and error theory
• Understanding and coping with the emotional barriers associated with significant healthcare events
• Undertaking a systems-based analysis of a significant event
• The new Enhanced SEA method
In this section we will cover
1. The background to this module
2. An overview of Human Factors
3. An overview of Human Error Theory
4. The natural emotional response to significant events
5. The systems-based approach
Background

- Primary care has a poor track record of acknowledging significant events and learning from them effectively, although this is now improving.

- Often we simply fail to act on them or, if we do, we tend to discuss them informally and superficially with trusted colleagues and sometimes even the wider team, but then we just agree to “do something,” “try harder,” or “look out for that”.

- Discussing important incidents in this way is more likely to lead to a superficial description rather than an in-depth analysis of the event – this in turn directly affects the chances of making the necessary improvements in practice systems to minimise the risk of the event happening again in the future.

- We also have a tendency to be over critical of our own role or the role of others in significant events and apportion ‘personal blame’, which as we shall see is completely misplaced in the vast majority of cases.

- Making a mistake and being part of a significant event can also have an emotional impact on the healthcare professionals involved – who can be labelled the ‘second-victims’ of the event after the patient.

- And this is a reason why we may avoid the topic in some cases or be very selective over what incidents we chose to highlight because of personal feelings of guilt or embarrassment or fear of punishment or ridicule.

Does any of this sound familiar?
Introduction

• Brushing our mistakes under the carpet or dealing with them superficially, therefore, is a missed opportunity for professional learning and improving patient care.

• In this short module, we present a structured way of highlighting and investigating significant events in a non-threatening, more meaningful manner by using a human factors systems approach.

• The key focus is on understanding, analysing and redesigning the systems we work in and, crucially, how we as individuals interact with them in order to learn how we can reduce the risks of future significant events.

• Without undertaking a systems-based analysis to adequately understand why an event happened and ensure that an appropriate action plan for improvement is developed and implemented, it’s likely that five weeks or five months or five years down the line the same thing will happen to someone else.

• We have named our human factors approach to analysing significant events – *Enhanced SEA*
Acquiring a basic knowledge of the science and practice of human factors (also known as Ergonomics) is necessary in gaining a fuller understanding of the nature of error and the contributory role of workplace systems and other organisational factors.

Having an awareness of these issues should lead to a more informed analysis of a significant event and the development of a more meaningful action plan for improvement.

We have focused on how to analyse significant events that highlight sub-optimal care or methods of practice that could be improved to enhance the quality and safety of health care.

This is because the evidence shows that the vast majority of significant events analysed by the primary care team deal with sub-optimal care, rather than highlight excellent examples of patient care.

We emphasise the importance of SEA to patient safety and quality improvement and give guidance for the primary care team on how to facilitate and sustain regular significant event meetings.
About Human Factors

Human Factors is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance (International Ergonomics Association).

The discipline is concerned with the "fit" between people and their capabilities and limitations to ensure that workplace tasks, functions, information, communication and the physical and social environment suit each person.

In healthcare, it can be used to design all aspects of a work system to support human performance and safety, and prevent errors that may harm patients.

Its goals are twofold:

- To support the cognitive and physical work of healthcare professionals, and
- To promote high quality, safe care for patients

However, Human Factors is a term that is easily misunderstood.

You may have read or heard others talk about the 'human factor' or something being 'caused by human factors' as if it was the result of failures by people.

This is completely contrary to the science and practice of Human Factors, which is about designing systems of work that support human performance and that are able to cope when things go wrong unexpectedly.
**About Human Factors**

Some common misconceptions regarding human factors and the corresponding facts

<table>
<thead>
<tr>
<th>FACT</th>
<th>MYTH</th>
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<tr>
<td>Human factors is about designing systems that are resilient to unanticipated events.</td>
<td>Human factors is about eliminating human error</td>
</tr>
<tr>
<td>Human factors addresses problems by modifying the design of the system to better aid people.</td>
<td>Human factors addresses problems by teaching people to modify their behaviour.</td>
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<tr>
<td>Human factors work ranges from the individual to the organisational level.</td>
<td>Human factors is focused only on individuals.</td>
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<tr>
<td>Human factors is a scientific discipline that requires years of training; most human factors professionals hold relevant graduate degrees</td>
<td>Human factors consists of a limited set of principles that can be learnt during brief training</td>
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About Human Factors

Awareness of human factors principles can help you to:

• **Understand** why healthcare staff make errors and in particular, which ‘systems factors’ threaten the safety of your patients

• **Improve** the safety culture of teams and organisations

• **Enhance** teamwork and improve communication between healthcare staff

• **Improve** the design of healthcare systems and equipment

• **Identify** ‘what went wrong’ and predict ‘what could go wrong’

• If you wish to know more Human Factors, follow this web link to a free Open Access article of interest: [http://qualitysafety.bmj.com/content/22/10/802.full](http://qualitysafety.bmj.com/content/22/10/802.full)
Enhanced Significant Event Analysis

Why do we often seek to ‘Shame and Blame’ others?

- In health care systems worldwide, the traditional response to significant events has been to blame, shame and punish individuals.
- However this culture is slowly changing in line with other high risk organisations such as those found in the commercial and military aviation, nuclear power and petro-chemical industries which recognised the futility of this approach many years ago.

‘Blaming’ is understandable for a number of reasons:

- From an organisational perspective it is convenient as it diminishes its accountability and may help to appease patients and the public.

- Legally, it is much easier to prosecute individuals than organisations.

- A number of psychological factors may predispose some of us to blame individuals instinctively after serious significant events.
Enhanced Significant Event Analysis

Emotional Responses

Please consider and reflect on the following concepts:

• Our knowledge of the outcome of a significant event unconsciously influences how we perceive the actions of those directly involved. Warning signs appear more obvious and consequences more foreseeable than they would have been to those involved – this is the ‘I-knew-it-all-along’ effect [known as Hindsight Bias]

• Most of us believe that we determine our own actions (most of the time) - we impute this automatically to other people even when their actions were not intended. In other words, they ‘choose’ to make mistakes [known as The Illusion of Free Will]

• Our natural tendency is to attribute someone’s actions (especially undesirable actions) to their personality traits or characteristics while (unintentionally) ignoring contextual contributory factors that may have constrained their actions [known as Fundamental Attribution Bias]

• We also assume that ‘bad’ things only happen to ‘bad’ people. When taken to extreme, even victims are blamed for their misfortune [known as the Just World Hypothesis]
Enhanced Significant Event Analysis

About Human Error

“Errors are the inevitable and usually acceptable price human beings have to pay for their remarkable ability to cope with very difficult informational tasks quickly and, more often than not, effectively”. Reason (1990)

- Creating a workplace environment where patient safety is paramount begins with the understanding of Human Error.

- Human beings make mistakes everyday – it is part of being human, it is a fact of life.

- 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 underlying chance that the consequences could be harmful.

- It is this awareness that often prevents such incidents as we purposefully heighten our attention and vigilance when we encounter situations or tasks we perceive to be risky.
About Human Error

- Some of the cognitive reasons (our mental processing powers of knowing e.g. levels of awareness, perception and memory) why we are so susceptible to error are outlined:
  - We have a short-term memory capacity
  - We have a limited ability to handle information
  - Our abilities to see, hear, smell, feel and taste are limited
  - There is a gap between our expectations of the level we think we can perform at and what happens in reality
  - We have selective attention spans
  - Our judgement will fail us
  - Our response to situations can be influenced by our stress, fatigue and awareness levels which can affect our judgements or perceptions
About Human Error

Take a few moments to study Reason’s (1990) graphic illustration of basic Human Error types and the examples outlined.

![Diagram of Human Error types]

- **SLIP**:
  - Attentional failure
  - Intrusion
  - Omission
  - Reveal
  - Misordering
  - Mistiming

- **LAPSE**:
  - Memory failures
  - Omitting planned items
  - Place-losing
  - Forgetting intentions

- **MISTAKE**:
  - Rule-based mistakes
  - Misapplication of good rules
  - Application of bad rules
  - Knowledge-based mistakes
  - Many variable forms

- **VIOLATION**:
  - Routine violations
  - Exceptional violations
  - Acts of sabotage

Cited from Reason, 1990
Enhanced Significant Event Analysis

About Human Error

Examples of Error Types

SLIP – e.g. Misreading the BNF and prescribing the wrong drug dosage

LAPSE – e.g. Forgetting to do a routine hospital referral for a very anxious patient with acute acne

MISTAKE – e.g. a patient with shortness of breath is diagnosed with pneumonia and treated with an antibiotic. A few days later she is admitted as her condition worsens. Subsequent investigations reveal a pulmonary embolism as the true problem.

VIOLATION – e.g. Deviating from the Practice Protocol on managing patients taking Methadone

Cited from Reason, 1990
About Human Error

It is extremely important to know that we can further divide all errors into two main groups:

• **Active Errors:**
These are committed by *frontline staff* and tend to have direct patient consequences (e.g. prescribing the wrong drug which causes the patient to experience headache and nausea).

• **Latent Errors (or System Errors).**
Latent or system errors create the *conditions, context and potential* for Active Errors. They seldom have immediate consequences, but can potentially affect many more patients (e.g. the computer information system automatically pre-selects a similar but clinically different drug).

• One human factors model that is increasingly well known in healthcare is the **Swiss Cheese Model** of organisational accidents shown in the next slide (Reason 1990).

• The Swiss Cheese Model hypothesises that in any system there are many levels of defence.

• Examples of levels of defence would be checking of drugs before administration, a preoperative checklist or marking a surgical site before an operation.

• Each of these levels of defence has little ‘holes’ in it which are caused by poor design, senior management decision-making, procedures, lack of training, limited resources etc. These holes are known as *‘latent conditions’.*
About Human Error

If latent conditions 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.’ That is to say, errors that occur 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. This is depicted by the arrow breaching all levels of defence in the diagram shown below.
Human Error – What is a Systems Approach?

“We cannot change the human condition, but we can change the conditions under which humans work.” Reason (2000)

• Too often when mistakes happen, individuals are blamed and little attempt is made to explore and address the underlying systemic causes that lead to errors (Russ et al., 2013)

• *Error is not the monopoly of an unfortunate few* - when placed in similar circumstances, the majority of people will make similar mistakes.

• However, if we accept human fallibility, we need to rely on well-designed systems to support us in the workplace.

• Unfortunately, current primary care systems are often deficient in many ways and are in need of better design to prevent or minimise significant events (e.g. test result handling or repeat prescribing systems).

• The systems approach to the analysis of human error assumes that humans will always make mistakes because of our inherent limitations and capabilities.

• In taking a systems-centred approach, therefore, human error is viewed as a symptom of weaknesses in the system, which points to the need for system design changes to be made

• Therefore by adopting a systems approach, we aim to implement more effective systems defences which account for and accommodate the fallibilities of human nature, rather than attempting to eliminate them.
Enhanced Significant Event Analysis

Human Error – The Systems Approach

Practical examples of systems approaches to accommodate human fallibilities, include:

- **Automate systems** where possible and appropriate (e.g. IT mail merges to invite patients with chronic diseases to the practice for clinical review or phone text alerts for appointments).

- ‘**Forcing functions**’ should be added where appropriate (e.g. adding reminders and ‘double clicks’ to confirm doses, dosing intervals and durations of high-risk medications – although these can sometimes be counter-productive)

- **Standardise systems** to reduce reliance on memory (e.g. Following Clinical Protocols)

- **Checklists** (e.g. are increasingly being used in Scottish hospitals e.g. in pre-operative settings to prevent wrong site or person surgery. Primary care examples include systematically checking the contents of the emergency bag and use of controlled drugs)

- **Minimise staff interruptions and distractions.** (e.g. Unnecessary interruptions during a consultation with a patient)

- **Add redundancies** (e.g. ‘double checks’ when administering MMR vaccinations).
Part Two
Overview of Significant Event Analysis

In this section we will cover

1. A brief overview of safety in primary care
2. The history of significant event analysis
3. The benefits and disadvantages of significant event analysis
4. The cultural context of SEA and its uptake within primary care
5. The emotional barriers to effective analysis
Safety in Primary Care

*What we know about patient safety in Primary Care*

- Primary care constitutes a significant component of the NHS, with up to 90% of public interaction with the health service occurring in this setting.

- Up to 1 million people visit their general practice every day in the UK, and research estimates that between 1 and 2% of these consultations may result in an adverse event, most of which will be of low to moderate severity (Health Foundation, 2011).

- Around 25% of significant events may involve a safety incident for the patient, with a further 60% being ‘near misses’ i.e. circumstances where a patient could have been avoidably harmed (McKay et al., 2009).

- Such events provide us with valuable opportunities to learn from mistakes and implement change so as to improve the quality of future patient care.

- Significant Event Analysis (SEA) is a well established method of identifying and learning from these types of events in primary care.
History of Significant Event Analysis

• SEA evolved differently from similar incident investigation techniques such as Root Cause Analysis which is used mainly in acute hospital settings and other high risk industries.

• It originated in UK general medical practice when Bradley (1992) proposed that the lack of scientific rigour, and the subjective and unstructured nature of traditional small group case based discussions (Balint 1957) could be overcome by merging this approach with the principles of Flanagan’s Critical Incident Technique (Flanagan, 1957).

• This form of ‘significant event analysis’ would help to reduce speculation or conjecture surrounding the ‘anecdotal’ discussion of an event, and focus the analysis on establishing the factual evidence necessary to have a fuller understanding of the incident and so direct more meaningful learning and improvement.

• However, while this was clearly desirable, a much-needed practical framework to guide care teams when analysing a significant event was never developed.

• A feasibility study involving a small number of care teams meeting to discuss and analyse significant events was undertaken soon after (Pringle et al., 1994), but again there was a lack of clarity in any published work around what the actual ‘analytical method’ entailed.
Subsequently the west of Scotland deanery developed a simple educational framework, adapted from Kolb’s Experiential Learning Cycle (right), to help guide the analytical process which sought to answer four questions: 1. **What happened**, 2. **Why did it happen?**, 3. **What was learned?**, and 4. **What was changed?**.

However, while helpful for some, this could also lead to rather superficial analyses. Without a deeper understanding of why events happen then it is unlikely we can take effective action to minimise the risk of them happening again.

Nor did this approach address the psychological barriers to raising and investigating safety incidents that is apparent for many clinicians – the so-called ‘second-victim’ effect.

Existing approaches to SEA in primary care, therefore, often fail to consider the human factors systems issues which contribute to significant events - and provide a deeper perspective that goes beyond the individuals involved - leading to ineffective analyses and action plans for improvement.
Enhanced Significant Event Analysis

Current SEA Expectations

SEA has risen in prominence in the past decade in UK primary care.

It is well suited to dealing with the daily uncertainties and complexities of primary care. It can be used to address a wider range of complex issues than conventional quality improvement methods, such as audit, giving the practice team greater flexibility for improvement.

There is now a number of SEA related obligations for individual clinicians, managers and care teams with regard to specialty training, the QoF contract, appraisal & revalidation and CPD.

SEA is viewed as important because when effectively performed it has a number of benefits e.g.:

- **Reflecting** and learning from interesting or complex cases or important safety events
- **Identifying** individual or practice training needs, and system weaknesses
- **Facilitating** the rapid implementation of change and improvement
- **Contributing** to the management of risk in the practice
- **Enhancing** the safety of patient care and local safety culture
- **Highlighting** patient safety incidents and other events to be notified to local and national reporting systems.
SEA Problems and Challenges

• SEA by its very nature requires us to challenge our performance and confront our mistakes as individuals and as a care team.

• However, through this self-analysing approach we are prone to a number of emotional reactions that may considerably reduce our ability to learn and improve care practices.

• Responding critically and emotionally may create an atmosphere of subjective criticism as opposed to objective analysis.

• This can make sensitive events more difficult to analyse (if indeed they are raised in the first place) as those involved may become defensive and the environment may become too uncomfortable.

• This often leads to a degree of selectivity when choosing events to analyse, with staff opting for the so-called “safe” events that present the lowest potential for confrontation or embarrassment, while more ‘difficult’ events may be ignored.

• We know from evidence that many SEAs are superficially conducted and appear unlikely to minimise the risks of the event happening again in the future.

• Adopting a human factors systems approach seeks to de-personalise event analysis and lessen the associated emotional reactions by focusing on the wider issues in the practice and beyond which contributed to a significant event – more often than not by illustrating system weakness rather than personal failures.
Part Three

*Enhanced Significant Event Analysis* – taking a Human Factors System Approach

In this section we will cover

1. About Enhanced SEA
2. The Emotional tool for the individual
3. The team tool to facilitate human factors analysis
4. The enhanced SEA report format
5. An edited version of the seven steps below
About the New Enhance SEA Tool

In response to current SEA deficiencies, a new approach has been developed for testing. The enhanced SEA tool is divided into three parts:

1. A small Personal Booklet to help individuals reflect on the potential emotional impacts of a significant event - and their own role in the event - by using human factors principles to gain a clearer understanding of all of the contributory factors involved. It also comes with a small set of four guide Cards (Introduction, People, Activity & Environment) which outline the most common contributory factors causing significant events to be used as prompts to during the analysis.

2. A simple A3 size Desk Pad for the care team, the sheets from which can be distributed to all those who attend a team meeting to analyse significant events. Each sheet contains instructions and prompts to guide the care team to take a systems-based approach to analysing the event in question and take notes on what was agreed – the above cards may also be used at this stage.

3. Finally, a new SEA Report Format has been designed – you may already be familiar with the existing report format for writing-up SEAs, this is now slightly updated to accommodate a systems-centred approach.
About the New Enhanced SEA Tool

• At the individual level, reflecting on a significant event using the small Personal Booklet encourages your own emotional response and possible support needs prior to focussing on what happened and what should be done.

• The individual can then choose to complete a written SEA report or bring the highlighted event to the care team meeting for a group analysis.

• At the care team level, the guide tool will assist the group to focus on determining the interactions between the individual, the complexity of the task that was undertaken and wider systems issues in order to develop a more meaningful action plan for improvement.

• Relevant information, documentation and guidance on the new tool and the SHINE Enhanced SEA Pilot Project can be downloaded from: www.nes.scot.nhs.uk/shine

• The Personal Booklet and the A3 Desk Pad Tool are shown in the following pages.
• Please read through and familiarise yourself with each of them
Enhanced Significant Event Analysis
SMALL PERSONAL BOOKLET – TITLE PAGE

A Tool for the Individual Practitioner & Primary Care Team
The Tool is structured in 3 phases:

- **Phase 1**: Addressing the Personal Impact of the event
- **Phase 2**: Applying a ‘Human Factors’ framework
- **Phase 3**: Define the Action Plan - including learning from the event
Introduction

Being involved in a significant event is an opportunity for healthcare professionals to learn, and enhance patient and client safety.

A simple way to view the discipline of ‘Human Factors’ is to think about the interactions between three work-related factors: People, Activity and the Environment - and how they combine to impact on people’s health and safety-related behaviour.

Evidence suggests that the application of ‘Human Factors’ knowledge enhances performance in the workplace and improves understanding of the complex interactions which contribute to significant events.
However

It is important to think about how you feel about your involvement in a significant event, which may make effective analysis of the event potentially difficult.

Examples of responses may include anxiety, guilt, stress, anger or indifference, all are known to affect healthcare professionals involved in significant events.

The Tool takes account of your responses to an event by encouraging you to reflect on them.

The aim is for you to achieve a better readiness to analyse and learn from the significant event more effectively by using the systems-based Human Factors approach outlined in the Tool.
Phase 1  Addressing the Personal Impact

How you feel about the significant event influences how you think and what you do.

Now, consider how are you are feeling about the event.

- you may be upset
- you may be lacking in confidence
- you may feel ‘strangely neutral’ - why is this?
- you may think this is an opportunity to improve patient care

Take a few moments to reflect on why you may be feeling this way.
Phase 1

Addressing the Personal Impact

After being involved in a significant event, it is normal to feel some degree of personal responsibility for the event.

However, Human Factors theory suggests that significant events are rarely fully related to the actions of a single healthcare professional.

SEA Research shows that there are often other work-based ‘contributory factors’ such as People (e.g. patients with complex illness), Activity (e.g. workload issues) and Environment (e.g. poor communication systems) that often combine to cause the significant event.
Phase 1  Addressing the Personal Impact

- Having explored your personal feelings about the event, it is now time to reflect more objectively.

- At this point, you may also feel it is useful to discuss what happened with a trusted colleague or someone close to you.
Phase 2
Applying a Human Factors Framework

Take a moment to read over examples of the possible contributory factors that can combine to cause significant events.

PEOPLE
Individual e.g. physical, psychological issues, social and domestic issues, personality issues, cognitive factors, competence skills, attitudes, risk perception, education and training.

Team e.g. role congruence, leadership, support and cultural factors, communication.

Patients e.g. clinical condition, physical factors, social factors, mental/psychological factors, interpersonal relationships.

Other e.g. hospital policy, social services.

ACTIVITY
Complexity of Process or Work.
Guidelines, Policies and Procedures e.g. not up-to-date, unavailable, unclear/unsupported, not followed.

Procedural/Task Design e.g. level of complexity, workload, poorly designed.

Equipment e.g. displays, integrity, positioning, usability lacking.

ENVIRONMENT
Work Setting e.g. administrative factors, design of physical environment, environment, staffing, workload and hours of work, time.

Organisational e.g. organisational structure, priorities, externally imported risks, safety culture.

Communications e.g. verbal, written, non-verbal systems.

Education and Training e.g. competence, supervision, availability/accessibility, appropriateness.

Societal, Cultural and Regulatory Influences
Phase 2 Applying a Human Factors Framework

Take a moment to reflect on this brief summary of a significant event:

A GP surgery decided to have their health visitor trained to administer childhood immunisations to ease their practice nurse’s workload. The health visitor started working under the supervision of another qualified health visitor after completing her training. A three-month old girl attended one of the first ‘new’ immunisation clinics to receive her second booster. The clinic was very busy. The MMR and DTP/Hib vaccinations were placed on the same table. The health visitor picked up the ‘wrong’ vial while attempting to answer some of the mother’s general questions and accidentally administered the MMR rather than the required DTP/Hib vaccine. She realised her error when performing the ‘double check’ of the vial with her colleague AFTER administering the vaccine. The health visitor immediately informed the GP and parents, and apologised for ‘…my accident…’. The GP and health visitor contacted the local hospital paediatric department to check for likely complications and re-assessed the child on several further occasions. The child did not suffer any harm and received the appropriate vaccination a few days later.

Impacts: distressed parents and staff, potential (low) risk of harm to baby, need to access expert advice on risks, potential complaint and adverse media publicity, need to reassure and apologise verbally and in writing to parents.

The framework on the next page outlines the contributory "people", "activity" and "environmental" factors that may have influenced the cause of this significant event.
Phase 2
Applying a Human Factors Framework
Contributory Factors and Interactions

**PEOPLE FACTORS**
The health visitor had just finished her training. She had adequate knowledge, but required additional experience and supervision.

She was distracted during the process by the parent’s questions.

The second health visitor had assumed the correct vaccine would be administered.

Staff felt under pressure because of the busy workload.

Staff go into ‘automatic pilot’ mode.

**ACTIVITY FACTORS**
There was only one table for all vaccines and the room was too small to accommodate health care workers, the patient and several family members.

The different vaccines were placed in close proximity.

The different vaccines looked very similar.

High volume of patients and vaccinations.

**ENVIRONMENT FACTORS**
Increased workload resulted in decision to create new roles and duties.

Efficiency savings resulted in different age groups attending a combined clinic for different types of vaccinations rather than vaccination-specific clinics.

Lack of a formal protocol outlining the system for safe management of the whole vaccination process, including double-checking with colleague and parent/carer.

The practice wrongly assumed that the local primary care organisation would have trained both health visitors to develop and follow a relevant protocol.
Phase 2

Applying a Human Factors Framework

MMR Significant Event

Reflect on some potential Learning Issues and the Action Plan for Improvement below. You may think of other system improvements that are needed to minimise the chances of the event happening again.

**LEARNING ISSUES**
(Individual and Practice Level)

- Existing immunisation system failed to properly protect the safety of a child – no formal, reliable system in place.
- Because of this system flaw, human error was inevitable.
- Staff administering vaccinations should be empowered to develop, implement and follow a systems-based protocol.
- There was a lack of communication between staff and between staff and parents.
- The combined clinics and volume of associated workload contributed to the error.
- Assumption made that the immunisation training body would have developed a protocol and would be responsible for this.
- Responsibility and liability is a practice issue.

**ACTION PLAN**
(System Improvements)

- The practice sent a written apology to the family and informed them that an investigation led to a new immunisation system being introduced.
- A system protocol was developed, laminated and placed in the room used for immunisation. It was added to the practice protocols folder and the new staff induction pack.
- In the fridge, one designated and clearly marked shelf would hold all the childhood vaccinations.
- A wall-mounted sign was introduced to remind staff to keep work surfaces uncluttered to provide a good overview of different vaccines, which should be clearly separated.
- Separate designated immunisation clinics were introduced to allow more time for vaccination and recording.
- The issue will be monitored at SEA meetings until the new system is embedded in routine practice.
Phase 2  Applying a Human Factors Framework

- Consider the Human Factors framework from the previous page.

- What were the People, Activity and Environment factors that combined to make your event more likely to happen.

- Use the three cards included with this tool to help you identify these contributory factors.

Thinking about how some or all of the factors combined to influence your event, re-assess if your original judgement about your role in the event would now change.
You may now have a better understanding of some of the system-based factors that contributed to your event.

For some of these issues you may be able to make immediate improvements, while for others you may need to include the wider team.

Consider what changes you can potentially make to minimise the chances of this event happening again.

Remember that to gain a fuller understanding of the contributory factors influencing the event, you may need to undertake a more in-depth analysis with the wider team.
Phase 3  Defining the Action Plan

You now have the following options:

- You decide that this event needs to be shared and analysed within your team – remember to apply the Desk Pad Tool for a team based significant event analysis and/or;

- Record the significant event using the recommended report format including an action plan making sure to include your learning from the event or state that no further action is necessary, but justify why this is the case.
Enhanced Significant Event Analysis

SMALL SET OF FOUR CARDS TO PROMPT A SYSTEMS-CENTRED SEA AT THE INDIVIDUAL AND TEAM-BASED LEVEL

INTRODUCTION

Human factors science helps explain interactions affecting significant events.

Focusing SEA on the three areas outlined herein may identify systems to be improved, reducing risk.

The personal impact of an event may impede its analysis - consider your feelings about the event, support others and be sensitive to their feelings.

Process
Agree who will lead the analysis (the person highlighting the event?)
Agree who will minute the meeting.
Raise concerns about the event before its analysis.
Distribute the SEA report for comment/agreement

PEOPLE

Individual e.g. physical, psychological, personality or social issues; cognitive factors, competence, skills, attitudes, risk perception, training issues

Team e.g. roles, support, communication, leadership

Patient e.g. clinical condition, physical, social, psychological, relationship factors

Others e.g. other health & social services

ACTIVITY

Complexity of work process or task guidelines, policies & procedures e.g. not up-to-date, not available, unclear/unusable, not followed

Design or organisation of work process or system e.g. level of complexity, workload, poor design

Equipment e.g. positioning, not available, not working, not calibrated, usability issues

ENVIRONMENT

Work setting e.g. staffing, environmental conditions, workload or hours of work, design of physical environment, administrative and/orme factors.

Organisational e.g. safety culture, priorities, external risks, organisational structure.

Communication e.g. verbal, written, non verbal systems, poor communication, failure to communicate.

Education and Training e.g. supervision, competence, availability/accessibility, appropriateness

Societal, Cultural and Regulatory influences
Enhanced Significant Event Analysis - A3 Desk Pad Tool

TEAM BASED ANALYSIS TOOL
Applying a Human Factors Framework

INTRODUCTION
- Human factors science helps explain interactions contributing to significant events.
- Focusing SEA on the three areas outlined herein may identify systems to be improved, reducing risk.
- The personal impact of an event may impede its analysis - consider your feelings about the event, support others and be sensitive to their feelings.

PROCESS
1. Agree who will minute the discussion and complete the SEA report.
2. Express any concerns before commencing the analysis.
3. Analyse the event by exploring potential contributory factors in each of the three headed areas.
4. Complete the enhanced SEA report and distribute for comment/agreement.

NOTES:

PEOPLE
- Individual e.g. physical, psychological, personality or social issues; cognitive factors, competence, skills, attitudes, risk perception, training issues
- Team e.g. roles, support, communication, leadership
- Patient e.g. clinical condition, physical, social, psychological, relationship factors
- Others e.g. other health and social services

ACTIVITY
- Complexity of work process or task guidelines, policies and procedures e.g. not up-to-date, not available, unclear/unsafe, not followed
- Design or organisation of work process or system e.g. level of complexity, workload, poor design
- Equipment e.g. positioning, not available, not working, not calibrated, usability issues

ENVIRONMENT
- Work setting e.g. staffing, environmental conditions, work hours or design of physical environment, administrative and/or time factors
- Organisational e.g. safety culture, priorities, external risks, organisational structure
- Communication e.g. verbal, written, non-verbal systems, poor communication, failure to communicate
- Education and Training e.g. supervision, competence, availability/accessibility, appropriateness
- Societal, Cultural and Regulatory influences

Enhanced SEA

HD Foundation
Shine
NHS Education
for Scotland
Part Four
Case Studies & Further Information

In this section we will illustrate the previous information with case studies
Case Study 1

A GP surgery decided to train their health visitor to administer childhood immunisations to ease their practice nurse’s workload. The health visitor started working under the supervision of another qualified health visitor after completing her training. A three-month old girl attended one of the first ‘new’ immunisation clinics to receive her second booster. The clinic was very busy. The MMR and DTP/Hib vaccinations were placed on the same table. The health visitor picked up the ‘wrong’ vial while attempting to answer some of the mother’s general questions and accidentally administered the MMR rather than the required DTP/Hib vaccine. She realised her error when performing the ‘double check’ of the vial with her colleague AFTER administering the vaccine. The health visitor immediately informed the GP and parents, and apologised for ‘…my accident…’. The GP and health visitor contacted the local hospital paediatric department to check for likely complications and re-assessed the child on several further occasions. The child did not suffer any harm and received the appropriate vaccination a few days later.
## Case Study 1

### Examples of some contributory factors

<table>
<thead>
<tr>
<th>PEOPLE</th>
<th>ACTIVITY</th>
<th>ENVIRONMENT</th>
</tr>
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</table>
| • The health visitor had just finished her training. She had adequate knowledge, but required additional experience and supervision.  
• She was distracted during the process by the parent’s questions.  
• The second health visitor had assumed the correct vaccine would be administered.  
• Staff felt under pressure because of the busy workload  
• Staff go into ‘automatic pilot’ mode | • There was only one table for all vaccines and the room was too small to accommodate health care workers, the patient and several family members.  
• The different vaccines were placed in close proximity.  
• The different vaccines looked very similar  
• High volume of patients and vaccinations | • Increased workload resulted in decision to create new roles and duties.  
• Efficiency savings resulted in different age groups attending a combined clinic for different types of vaccinations rather than vaccination-specific clinics  
• Lack of a formal Protocol outlining the system for safe management of the whole vaccination process, including double-checking with colleague and Parent/Carer |
Case Study 2

A Receptionist asked the duty GP to sign a repeat prescription for Amitriptyline for a patient waiting at the desk. The GP noticed the dose of Amitriptyline appeared incorrect and checked the patient’s medical record. The GP discovered that *Amisulpride, rather than Amitryptiline*, should have been prescribed. She amended the prescription, explained the error to the patient, and apologised. Fortunately, the patient had not suffered any complications from the wrong drug (and dose) and had not suffered a psychotic exacerbation.
## Case Study 2

### Examples of some contributory factors

<table>
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</table>
| • An administrative team member:  
  - had entered the prescription incorrectly a few months before. Amitriptyline is prescribed often, and has several indications, including chronic pain and irritable bowel syndrome. Amisulpride is an antipsychotic drug and is very rarely prescribed.  
  - Assumed from experience and deciphering of written note that is must be Amitriptyline.  
  - Lacked sufficient clinical knowledge to realise a potential patient safety issue  
  • A GP had signed the initial, wrong prescription.  
  • Patient expectation of quick service. | • The initial request for Amisulpride was a *handwritten note and mostly illegible*.  
  • GPs often sign batches of prescriptions, without always checking for accuracy.  
  • Flexible workaround to satisfy patient need on the day. | • Time and workload pressures  
  • Distractions and noisy environment  
  • Possible staff training on awareness of high risk medications  
  • Availability of handwritten prescriptions  
  • Safety system design issue with repeat prescribing signing by GPs |
HUMAN FACTORS SCIENCE IN ACTION

If you would like to read about or see perhaps the ultimate expression of human factors knowledge in action, feel free to access the materials below:

CAPTAIN ‘SULLY’ SULLENBERG – ‘Miracle on the New York Hudson River’

Newspaper Report

Video
http://news.bbc.co.uk/1/hi/world/americas/7834853.stm

Simulation of the Flight:
http://news.bbc.co.uk/1/hi/world/7834499.stm
References, Further Reading & Acknowledgements


Thanks to the University of Nottingham (MSc Applied Ergonomics Moodle Resources)
Evaluation Link

Please click on the link to provide some very quick feedback on the module – this is extremely important to help us improve. It should take no longer than 2 minutes.

Click here

Enhanced SEA Report From

More information (including downloading the Enhanced SEA Report Form) can be found here:

www.nes.scot.nhs.uk/shine/

Certificate of CPD

You can print this certificate on the next page by entering your name and estimating to the nearest hour the time devoted to learning by completing the module and any related educational or improvement activities.
Certificate of Completion

To print your certificate

1. Click forward arrow to go to the next page.
2. Fill in your name, date of completion and total number of hours devoted
3. Select File>Print
4. SELECT CURRENT PAGE (Remember this step as failing to select “Current Page” will cause the entire module to be printed)
5. Collect your certificate
Contents
Please select from the options below

1. Background and Context
2. Overview of Significant Event Analysis
3. Enhanced Significant Event Analysis
4. Case Studies and Further Information
Glossary of Terms

**Active Failure**
Actions or processes during the provision of direct patient care that fail to achieve their expected aims, for example, errors of omission or commission. While some active failures may contribute to patient injury, not all do.
*Wade, 2002; Davies, 2003*

**Adverse Event**
unintended injuries caused by medical management rather than the disease process
*Micel, 2004*
Glossary of Terms

**Error**
A generic term to encompass all those occasions in which a planned sequence of mental or physical activities fails to achieve its intended outcome, and when these failures cannot attributed to the intervention of some change agency. (Reason, 1990) ; failure of planned actions to achieve their desired ends-without the intervention of some unforeseeable event (Reason, 1997)

**Latent Error**
Errors in the design, organization, training, or maintenance that lead to operator errors. They may lie dormant in the system for lengthy periods of time. (Kohn, 2000)

**Latent Risk**
Latent risks arise from decisions made by designers, builders, procedure writers, and top level management. Latent conditions may lie dormant within the system for many years before they combine with active failures and local triggers to create an accident opportunity. Unlike active failures, latent conditions can be identified and remedied before an adverse event occurs. Understanding this leads to proactive rather than reactive risk management.

*Reason 2000*
Glossary of Terms

**Mistake**
Deficiency or failure in the judgemental and/or inferential processes involved in the selection of an objective or in the specification of the means to achieve it, irrespective whether or not the actions directed by this decision scheme run according to plan; errors of conscious thought including rule-based errors that occur during problem solving when a wrong rule is chose and knowledge based errors that arise because of lack of knowledge or misinterpretation of the problem.

*Leape 1994*

**Near Miss**
Any patient safety incident that had the potential to cause harm but was prevented, resulting in no harm to patients receiving NHS-funded healthcare.

*National Patient Safety Agency (NPSA), 2006*
## Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td><strong>Patient Harm</strong></td>
<td>Temporary or permanent impairment of the physical, emotional, or psychological function or structure of the body and/or pain resulting from requiring intervention. <em>(NCC MERP, 1998)</em></td>
</tr>
<tr>
<td><strong>Patient Safety Incident</strong></td>
<td>Any unintended or unexpected incident that could have or did lead to harm for one or more patients receiving NHS-funded healthcare. <em>National Patient Safety Agency (NPSA), 2006</em></td>
</tr>
<tr>
<td><strong>Quality Improvement</strong></td>
<td>A systematic approach that uses specific techniques to improve quality <em>Health Foundation 2013</em></td>
</tr>
</tbody>
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## Glossary of Terms

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<tr>
<td><strong>Safety Culture</strong></td>
<td>An integrated pattern of individual and organizational behaviour, based upon shared beliefs and values, that continuously seeks to minimize patient harm which may result from the processes of care delivery. Aspden 2004</td>
</tr>
<tr>
<td><strong>Significant Event</strong></td>
<td>“Any event thought by anyone in the team to be significant in the care of patients or the standing of the practice” Pringle et al, 1995</td>
</tr>
<tr>
<td><strong>Significant Event Analysis/Audit</strong></td>
<td>Significant Event Analysis/Audit (SEA) is a qualitative method of clinical audit that is reportedly based on a synthesis of traditional case review and the research principles of the critical incident technique, theoretically ensuring that a more robust approach is taken to reviewing events.</td>
</tr>
</tbody>
</table>
Glossary of Terms

**Swiss Cheese Model**

The Swiss Cheese Model hypothesises that in any system there are many levels of defence. Examples of levels of defence would be checking of drugs before administration, a preoperative checklist or marking a surgical site before an operation. Each of these levels of defence has little ‘holes’ in it which are caused by poor design, senior management decision-making, procedures, lack of training, limited resources etc. These holes are known as ‘latent conditions’.

*Patient Safety First Campaign 2010*

**Systems Approach**

An method of reviewing patient safety which moves away from focusing blame solely on individuals, and looking at what was wrong with the system in which the individuals were working.

*Adapted from National Patient Safety 2006*