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Curriculum for Handover Training in Medical Education

Version May 2014 (English)

Project information

Contents

Introduction

What is included in the curriculum and why is it important?

<u>What is handover?</u>

Handover is the accurate, reliable **communication** of task-relevant information between doctors and patients and from one care-giver to another. This occurs in many situations in healthcare.

<u>Why is handover important?</u>

Improperly conducted handovers lead to wrong treatment, delays in medical diagnosis, life threatening **adverse events**, patient complaints, increased health care expenditure, increased length of stay hospital and a range of other effects that impact on the health system(1).

This is how accurate performed and well-structured handovers improve **patient safety**, i.e. "absence of preventable harm to a patient during the process of health care" (2).

<u>How to teach handover?</u>

The best way to teach practical skills is, to let students perform the skill. To decrease the risk for real patients **simulation** is the teaching method of choice.

Therefore and on the basis of the project's preceding results (3,4), this curriculum is divided into three modules:

> Module 1 – Risk and Error Management
>
> Module 2 – Effective Communication
>
> Module 3 – Simulation

How to use this training material

There is a separate "Instruction Guide" available, leading you step by step through the process of developing and implementing an individual handover training module at your site.

If you wish to use this material, we would be very grateful if you provide your email, identification and describe the objective of using this material.

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Overview of Training Contents

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Module 1 – Risk and Error Management

> "Is from our wildest theories, including those that are erroneous, that we learn more. No one can avoid making mistakes, the biggest thing is to learn from them."
>
> *Karl R. Popper*
> *Conjectures and Refutations*

Risk and Error Management

- Patient Safety
- Epidemiology
- Taxonomy
- Human and system factors
- Errors and comunication
- Improving safety in handover process

1.1 – Basis of Patient Safety

Learning Outcomes

- ✓ Describe why patient safety has emerged as an important issue in health care
- ✓ Identify the impact of adverse events
- ✓ Define key concepts related to patient safety
- ✓ Be aware of the importance of patient safety for health care
- ✓ Identify how to define the severity of adverse events
- ✓ Be aware that errors and consequences don't have a lineal relation.
- ✓ Define a 'preventable adverse event'
- ✓ Identify an active error and a latent condition

Key messages for students

- Adverse events are a public health problem
- A large number of patients die as a consequence of adverse events
- The impact of adverse events in economic terms is also important
- Professional perception about the impact of adverse events is sub-optimal
- The increase of health care complexity increases the risks

Patient Safety

Although health care outcomes have significantly improved with scientific advances, studies show that in parallel with these benefits there are significant risks for patient safety (5).

Until a few decades ago, traditional medicine was based on simple, uncomplicated interactions between health professionals and patients.

However, technological advances have brought medicine to a different level, with a diagnosis and treatment now based on a variety of laboratory and technological results.

Moreover health care today is carried out in a fragmented way: there has been an increase in specialists and subspecialists; patients move between different health care professionals and yet there is no tradition of teamwork among these health professionals (6).

The concept of 'health care risk' is imprecise and includes any non-desirable situation or factor that can increase the likelihood of errors and have negative consequences for patients.

It is obvious that the complex combination of processes, technologies and human interactions that constitute modern healthcare can bring significant benefits but also an unavoidable risk of errors and adverse events (7).

We have to consider improving patient safety from the perspective of the measurable progress of health care. There is a "price to pay": a more effective medicine carries an increase in potential risks, due to its associated complexity (8).

Deficits in patient safety, as explained below, have serious consequences and could be considered as a major public health problem.

There is a false generalization that the healthcare environment is safe. Most professionals and patients when asked about patient safety in general, answer that the health care system is safe. However, when they are asked about possible patient safety problems in their own workplace, most of them can recall several episodes where patient safety was at risk (9).

Preventing medical error is possible. Reports from other sectors, such as aeronautics, and in the healthcare sector itself, show that there has been a substantial improvement in safety in recent years.

What do we mean exactly by 'Patient Safety'?

To understand the term "Patient Safety" we will begin with the definition of Patient Safety in the International Classification for Patient Safety (ICPS).

The *World Alliance for Patient Safety* has defined and classified the concepts of patient safety in order to provide a common language and understanding of the terms used.

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Help for teachers

More information about ICPS:

http://www.who.int/patientsafety/implementation/taxonomy/publications/en/index.html

Patient Safety Definition

The World Health Organization defines Patient Safety as 'reducing the risk of unnecessary harm associated with healthcare to an acceptable minimum'.

This can be broken down into three elements: Reducing risk of injury to a minimum (reduce the risk as much as possible, while accepting that the total elimination of risk is not possible). Healthcare involves risks and the intention is to minimize these risks.

'Unnecessary damage' referring to damage that is NOT a result of an underlying disease or damage but a damage that we avoid.

Associated healthcare refers to damage arising from plans, actions or omissions related to healthcare, e.g. damage from an adverse event secondary to incorrect medication administration (6).

Leaders in patient safety define patient safety as a discipline in the health-care sector that applies scientific methods in patient safety towards the goal of achieving a trustworthy system of health-care delivery. Patient safety is also an attribute of health-care systems; it minimizes the incidence and impact of, and maximizes recovery, from adverse events (10).

The 2000 Institute of Medicine report, *To Err is Human*, builds upon more than 30 years of literature reports on medical errors in hospitals. The public scrutiny of this report has been unprecedented (11). Healthcare is a complex environment where errors can injure or kill (12).

It is now widely accepted that about 10% of all patients admitted to hospital will be unintentionally harmed in some way. To put that into context: there are more deaths annually as a result of health care errors than from road accidents, breast cancer and AIDS combined.

Beyond their cost in human lives, preventable medical errors also have other significant tolls. Preventable errors have been estimated to result in total costs (including the expense of additional care necessitated by the errors, lost income and household productivity, and disability) of between $17 billion and $29 billion per year in hospitals in the US (11).

Student activity 1.1

Small group discussion

Objectives:

To capture the preconceptions of medical students regarding medical errors

To identify the level of awareness of the occurrence of errors and adverse events in health care

Instructions:

Discuss these questions with your partner. Share the results of the discussion with the rest of the group.

Why do you consider that errors occur in the healthcare environment?

Do you think that patients often die from errors in healthcare?

How safe do you consider health care is in your country, region or hospital?

Do you have 'near experience' of an adverse event? What happened?

In your opinion, what were the main causes and underlying factors?

A Power Point file is available for this topic.

Epidemiology of errors and adverse events

> **Key messages for students**
>
> - Many people die in hospitals each year as results of medical errors
> - Different studies across the world show that approximately half of adverse events can be considered preventable

In order to appreciate the importance of patient safety, we need to explore the statistics of adverse events, the results from studies in some countries, and consequences in terms of morbidity and mortality.

It is also important to know the proportion of adverse events that could be considered preventable.

We need to look at the results of studies in this area so that we can quantify the importance of Patient Safety in healthcare. As many as 98,000 people, die in American hospitals each year as a result of preventable medical errors (11).
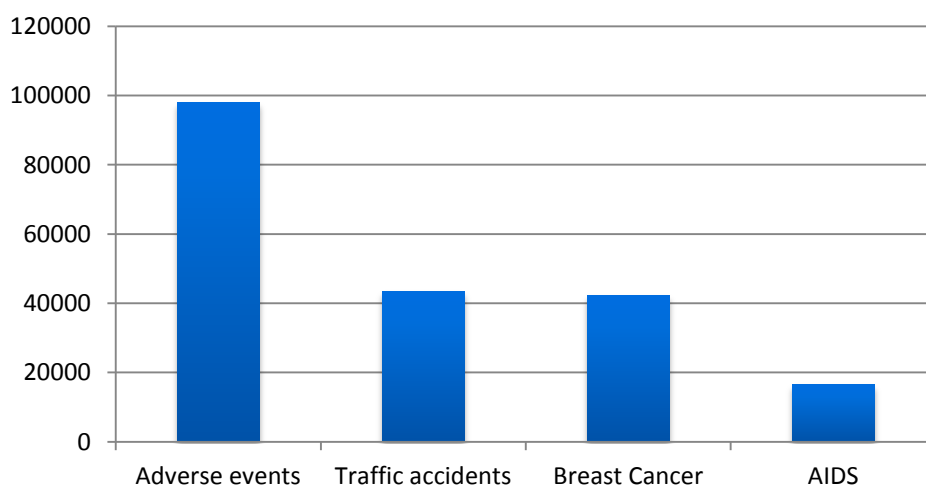
Figure 1: Causesof mortality in the US.

These figures are estimated from two large studies of patients in New York and in Utah and Colorado (13).

In the study by Brennan et al, the objective was focused on the medical and legal aspects related to the occurrence of adverse events. A total of 30,121 records of a random sample of patients discharged from 51 hospitals selected from the state of New York were reviewed.

Among the most significant findings we should emphasize that the study detected a 3.7% of adverse events, 50% of which were considered to be preventable by the reviewers.

The most frequent detected adverse events were associated with errors in medication, followed by infections and surgical wound complications.

The contributions of this study have been essential in identifying adverse events, and most subsequent studies have been based on the methodology for their development (13).

Following this key paper there have been many studies aimed at improving the quality of healthcare, by identifying the main causes of adverse events in order to facilitate the prioritization and implementation of prevention strategies.

A systematic review published in 2008 on adverse events in hospitals, summarized the information from the various studies conducted to that date, on the international environment. In this review, eight studies from the USA, Canada, the UK, Australia and New Zealand (6 had data on preventability) were included.

Results are displayed in Table 1 (p.16).

Table 1: Adverse events, preventability and outcome (14)

Reference	Brennan et al32	O'Neil et al23,28	Wilson et al3	Thomas et al2	Vincent et al33	Davis et al24,30	Baker et al31	Sari et al29	Median percentage (interquartile range)
No. of records	30000121	3141	14 179	14 700	1014	6579	3745	1006	–
No. of patients with at least one adverse event	1133 (3.8)	237* (7.5)	2353 (16.6)	475 (3.2)	110 (10.8)	850 (12.9)	255 (6.8)	110 (10.9)	9.2 (4.6 to 12.4)
No. of adverse events (if >1 adverse event per patient)	–	–	–	–	119 (11.7)	–	289 (7.7)	136 (13.5)	11.7 (7.7 to 13.5)
No. of preventable adverse events	–	103* (43.5)	1205 (51.2)	–	57 (47.9)	315 (37.1)	106 (41.6)	–	43.5 (39.4 to 49.6)
Outcome									
No or minor disability	644 (56.8)	–	1073 (45.6)	253 (53.3)	73 (66.4)	524 (61.6)	161 (55.7)	–	56.3 (51.4 to 62.8)
Temporary disability	187 (16.5)	–	702 (29.8)	150 (31.6)	21 (19.1)	162 (19.0)	36 (12.5)	–	19.1 (15.5 to 30.3)
Permanent disability	74 (6.5)	–	315 (13.4)	40 (8.4)	7 (6.4)	87 (10.2)	15 (5.2)	–	7.0 (6.1 to 11.0)
Death	154 (13.6)	–	112 (4.8)	31 (6.6)	9 (8.2)	38 (4.5)	46 (15.9)	–	7.4 (4.7 to 14.2)
Unknown	75 (6.6)	–	151 (6.4)	–	–	40 (4.7)	31 (10.7)	–	6.5 (5.1 to 9.7)

Although AE figures are high, it has been suggested that these figures are an underestimation and that we are only seeing the tip of an iceberg. The reason for this is because the methodology used in these studies only include adverse events of moderate or severe nature (resulted in some degree of disability, increased hospital stay and/or death). As these studies were based on medical records, it is possible that some cases were not recorded.

Another perspective that can help us to be aware of the impact of adverse events in the healthcare environment is to identify studies that describe evaluations of the effectiveness of clinical practice.

Several international studies, suggest that more than 50% of patients with diabetes, hypertension, hyperlipidaemia, asthma, heart failure or depression are inadequately treated (15–20).

Help for the teacher

Read the full systematic review and discuss it with your students:

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2569153/

This approach is based on the premise that a proportion of patients have an inadequate level of treatment; it is likely that many of these patients will have complications from their disease or de-compensation.

Another safety concern is when some of the recommended therapeutic interventions are not used (as discussed below, this problem is one of omission errors, actions not performed or actions inappropriately performed by healthcare professionals).

The figures are of particular significance when we calculate the impact on annual mortality in country like the U.S. in relation to overall causes of death.

Student activity 1.2

Small group exercise and discussion

Objectives:

Be aware of the frequency of adverse events. Estimate adverse events in your hospital.

Instructions:

Identify the lowest values found in the literature for the prevalence of adverse events and estimate the frequency of adverse events in your hospital. What is the frequency of adverse events annually in your hospital?

What do you think about this rate of adverse events?

A Power Point file is available for this topic.

Taxonomy of Patient Safety

> **Key messages for students**
>
> - There are different types of incidents related to patient safety
> - Patient safety problems refer to errors and preventable adverse events.
> - The mission of a safe organization is to minimize risks and errors in the system
> - Swiss cheese model is illustration of the concept that an accident or adverse event is the result of a chain of events

To understand the importance of patient safety in clinical practice and in the training of medical students, it is helpful to review some of the basic concepts that arise when discussing failures associated with patient care. Some of these are listed in the International Classification for Patient Safety (see Chapter 1.1 – Basis of Patient Safety - Patient Safety, p.11).

Incident related to patient safety: Event or circumstance that caused or could have caused unnecessary harm to a patient.

- **Quasi-incident**: The incident does not reach the patient. For example, a mistake in identifying a patient that was detected in time by healthcare professionals**.**
- **Undamaged Incident:** Incident reached the patient but did not cause any appreciable damage. For example a drug is administered to the wrong patient without causing any harm

  Adverse event: An incident that results in harm to the patient, i.e. as an operation on the incorrect limb or the administration of a wrong blood unit leading to the death of the patient.

  Adverse events may be avoidable or unavoidable.

  - **Avoidable or Preventable adverse events: are** defined as adverse events that result from an error or system design flaw that could have been avoided (21).

    Another definition is an adverse event caused by an error or system or equipment failure (22).

    For example: Administration of a medication to which the patient is allergic. The patient had the allergy recorded in the medical record. No one looked at the medical record or asked the patient about history of allergy.
  - **Unavoidable adverse events**: Unable to prevent or avoid according to the limited knowledge and resources available.

    For example: Alterations of the course or complications of the disease and not caused by medical intervention; despite appropriate quality standards,

complications arise. Proper surgical procedure has an intrinsic complication rate without error playing a part.

Another example is that adverse drug reactions are preventable incidents that involve an inherent risk to drugs without any misuse of drugs. An allergic reaction due to a drug administered for the first time (no known allergy to that drug).

When talking about patient safety problems, we are referring to errors and preventable adverse events and not complications or adverse reactions that occur in the absence of error.

Another important concept is:

Error: the failure to carry out a planned action as intended or applying an incorrect plan.

There are different ways to identify and classify medical errors.

The following diagram illustrates the basic types of error as proposed by James Reason
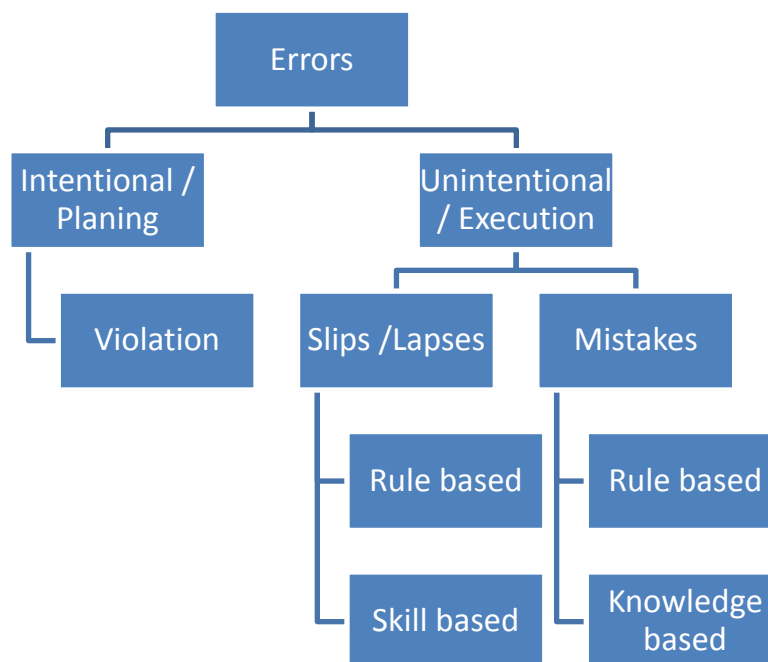
Figure 2: Errors classification according to James Reason.

According to the ICPS classification, incidents can be grouped according to a number of common characteristics. In this classification, 13 different types of incidents can be identified:

- Administration: Related to the process of admission, discharge, referral, inter-consultation, waiting list, transfer of care, patient identification, consent, etc.
- Process/clinical procedure: Related to the screening, recognition, diagnosis, evaluation, procedures, treatment interventions, analyses, tests, samples and results.
- Documentation: Related to applications, medical records evolution, checklists, instructions, guidelines, tags, wristbands, communication logs, reports, etc.
- Healthcare associated infection: "nosocomial infection" catheter-associated urinary tract infection, surgical site infections, blood stream infection, and pneumonia
- Medication/fluids for IV administration: Related to the drug and the process of medication use.
- Blood/blood products: Related to blood products and the process of use.
- Nutrition: Related to the type of diet and the process of using nutrition.
- Oxygen/gases/vapours: Related to the application process.
- Devices/Medical Equipment: Related to the device type, presentation, packaging, availability, suitability to task, sterility etc.
- Behaviour: Related to professional behaviour.
- Patient accidents: Related to mechanisms of injury, falls, and exposure to chemicals.
- Infrastructure/local/Facilities: Related to the appropriateness and condition of the facility.
- Resources/organization management: Related to the management adaptation to workload, availability and suitability of beds, services, human resources, equipment, protocols, procedures and guidelines.
- Damage: structural or functional alteration of the organism and/or any deleterious effect arising from that. Understand the concepts of illness, injury, suffering, disability and death.

Patients outcomes classification

Patient outcome where harm has occurred is attributed to incidents. In the context of the conceptual framework of the International Classification for Patient Safety (ICPS), the degree of harm is described as follows:

1- None: No degree of damage is considered when:
   - No symptoms are detected
   - No treatment required
2- Mild: Mild degree of damage considered when:
   - Patient is symptomatic
   - Symptoms are usually mild
   - The functional loss or damage is minimal
   - Intermediates but short-lived
   - Needless or minimal intervention
3- Moderate: moderate degree of damage is considered as follow:
   - Patient is symptomatic and requires intervention
   - Longer hospital stay
   - permanent or long-term damage
4- Severe: degree of damage is considered when:
   - Result is symptomatic and requires intervention to save patient's life
   - Shortened life expectancy
   - Causes functional damage or a major permanent or long-term loss.
5- Death:
   - Death caused or brought forward by the incident

The relationship between error and the effect on safety issues

Errors in healthcare do not necessarily have a linear and direct relationship with the magnitude of the consequences. For example, a serious mistake in the calculation of the dose of a drug may not have consequences if it is caught before it reaches the patient. Here we refer to an incident but not adverse event. However, a seemingly simple mistake such as not ensuring the safety rail of a stretcher can result in serious consequences, e.g. fractured femur.

In the previous section we have reviewed terms such as slips and lapses. In this section we will examine the mechanisms that generate errors.

One could rightly say that virtually every action that takes place in healthcare is associated with a risk of potential harm to the patient.

The mission of a safe organization is to minimize risks and errors in the system, making it easier for things to be well done and making it difficult for things to go wrong. This implies a good understanding of the causes and risk of errors and the way they contribute to preventable adverse events.

Patient Safety problems have three main sources:

1. **Performing a normal familiar action incorrectly**, for example, connecting the oxygen to the wrong terminal.

2. **Memory faults**, what was planned is not achieved; i.e. forgetting to ask a patient if he/she is taking any medication.

3. **Reasoning errors that can lead to wrong decisions**, for example, an error in dietary regimen due to not properly assessing the patient's condition.

We assume that to err is human. This is the first step we must take if we want to avoid medical error. The second is to analyse personal factors and systems that contribute to errors and dismiss the assumption that errors occur randomly or the concept that well-trained professionals do not make mistakes.

Everyone makes mistakes and one of the most common mistakes is to overestimate our ability to do what is right, especially if we take into account circumstances such as our daily working conditions where there may be problems with pressure, fatigue, stress, lack of optimal resources and personal problems.

REMEMBER THAT EVEN THE BEST ORGANIZATIONS HAVE ERRORS!

Factors involved in healthcare errors

The high frequency of errors in healthcare practice is not surprising as:

- The human being is much more unpredictable than any machine.

- There is little information about the frequency of medical error and consequences. An example of this is that medical error is rarely taught in medical undergraduate training and specialization.

- The healthcare environment reinforces the "infallibility myth", which leads to the concealment rather than the open admission of errors. Medical error may be viewed as failure.

- Errors are often listed as irresponsible actions and have punitive consequences. Too often errors are not addressed in a supportive and understanding fashion.

Active errors and latent conditions

To understand errors we need to look at the conditions under which they occur. In this section you need to understand the crucial difference between two key concepts: active errors and latent conditions.

The International classification of patient safety defined **active errors** as an error that occurs at the level of the frontline operator and whose effects are felt almost immediately.

It is a term used to refer to mistakes made by healthcare professionals in direct contact with patients.

Latent conditions are hidden conditions or seemingly inactive conditions. They are produced by system failures in the design, management and organization of care.

They are like the "resident pathogens in the system" and come from decisions made by designers, protocol editors and senior management (due to time pressure, understaffing, inadequate equipment, fatigue, inexperience, etc.) They may come from structural deficiencies systems and may have unintended consequences that predispose to adverse outcomes.

Here's an example:

Active Error: One patient underwent surgery for arthroscopy and a lateral error occurred by doing the intervention on the uninjured knee.

Latent conditions: In the operating room where the surgery was performed, there was no checking protocol (surgical checklist).

We could say that active errors are like mosquitoes. "We can try to kill them one by one, but there will always be others to replace them. The only remedy is to drain the swamps in which they breed" (11).

The following diagram gives more examples of active errors and latent conditions.
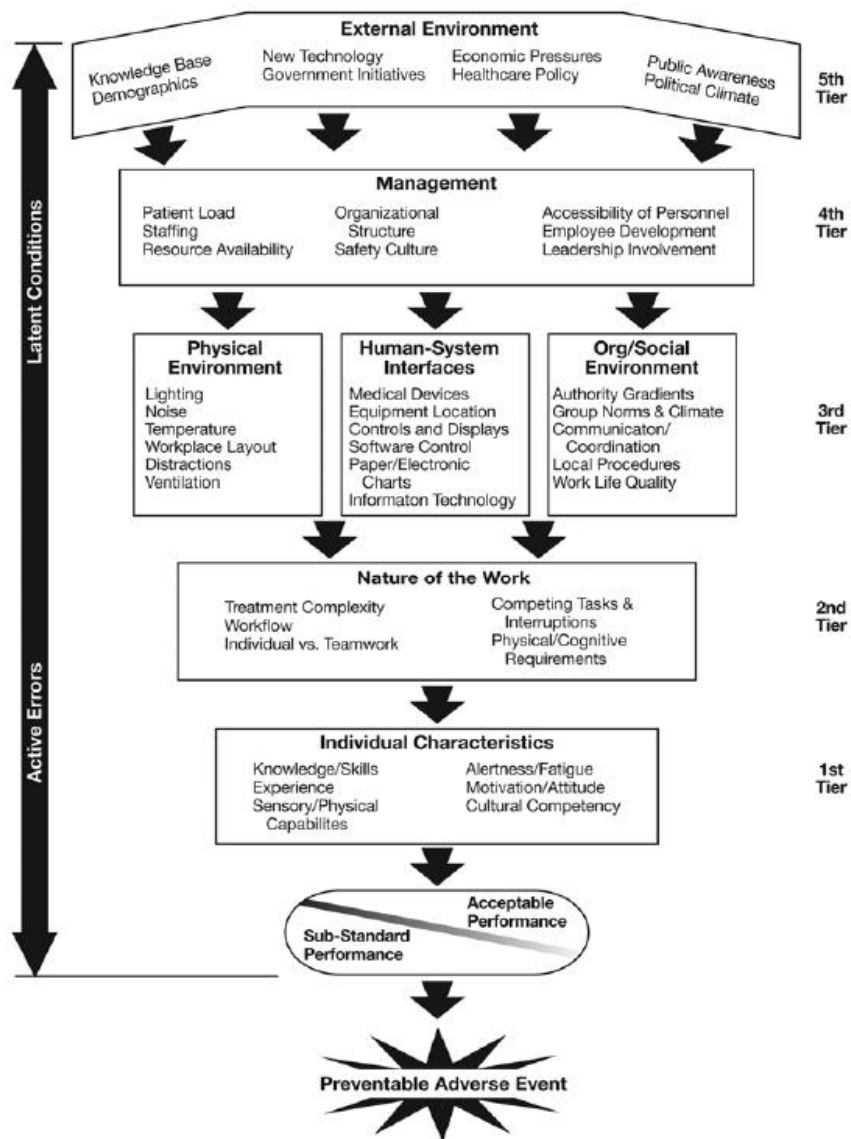
Figure 3: Contributing Factor to Adverse events in Health Care (23)

Organizations that have a design of reliable systems are those that:

- Are concerned about the possibility of failures.
- Expect mistakes and train their employees to recognize and repair them.
- Continually seek error scenarios and motivate professionals to envision them.
- Instead of performing local solutions, seek reforms of the system (24).

Reason, a British psychologist, analyses errors through two important concepts: the chain of failures and the Swiss cheese model. The system uses barriers and mechanisms of protection and safety so that no damage occurs to patients.

These barriers are represented by slices of cheese, but sometimes these are deficient, (represented by the holes in the cheese). The alignment of several "safety holes" may give rise to a chain of failures which individually could not have been relevant, but which together have formed a string through the holes in the cheese that can cause the accident or adverse event.

This is therefore a model to illustrate the concept that an accident or adverse event is the result of a chain of events. The main features of the model are:

1. Accidents happen due to multiple factors
2. There are defences to prevent accidents
3. But multiple errors "aligned" allow accidents or adverse events to occur
4. The review system is to identify how failures "cross" defences.

The following figures illustrates the Swiss cheese model.
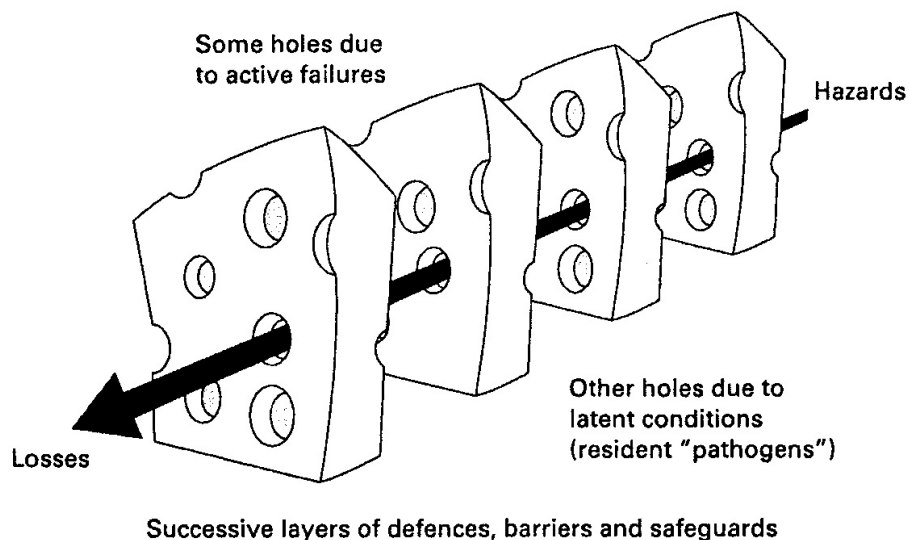
Figure 4: Swiss Cheese Model (23)

Causes of errors

Errors can occur for various reasons. A study conducted in an emergency department showed that most of the errors reviewed by the committees for mortality cases involved three or four contributing factors (25).

In this sense, we see a number of factors that may be associated with the errors contained in the following study (26).

Errors may develop due to:
- Communication Problems
- Inadequate professional -patient relationship
- Overconfidence
- Hesitation, timidity, routine
- Inadequate information and guidance
- Writing and reading errors
- Missed teaching
- Physical and mental exhaustion
- Application of new technologies
- Defects in resources, equipment and organization

Human and system factors

> **Key messages for students**
>
> - A failure to address human factors principles is a key aspect of most adverse events in health care
> - Human factor principle is making errors visible so that they can be intercepted
> - Human factor engineering contains methods and tools help healthcare teams perform patient safety analyses
> - Although risks cannot be completely avoided but systems can be designed to minimize the occurrence of accidents and their harmful effects

The Human Factor

The human factor relates to how environmental, organizational and job factors along with individual characteristics, influence behaviours at work and at the same time, health and safety (27).

Human factors refers to the relationship between human beings and the systems in which they interact (11). Human factor are considered as a risk to patient safety.

A failure to address human factors principles is a key aspect of most adverse events in health care. Therefore, all health-care workers need to have a basic understanding of human factors principles. Health-care workers who do not understand the basics of human factors are like infection control professionals who do not know about microbiology (27). The effect of human factors on healthcare can be addressed, with the goal of minimizing errors in multiple ways such as focusing on improving efficiency, creativity, productivity and job satisfaction.

A classic reference states addressing human factors as: "Enhancing clinical performance through an understanding of the effects of teamwork, tasks, equipment, workspace, culture, organization on human behaviour and abilities, and application of that knowledge in clinical settings"(28).

Therefore, an organization that addresses human factors will help promote safe clinical practice by an emphasis on good communication, teamwork and information handover. These tasks, once thought to be basic, have, in many cases, been overshadowed by the increasing complexity of health-care services and systems.

It is clear that healthcare outcomes can be different if human factors are taken into account by everyone involved in the organization (29).

Common human factors that increase risk are: fatigue, stress, cognition, audible and visual noise, training, workflow efficiency, consistency, interruptions and distractions, mental workload, physical environment, physical demands, device/product design, teamwork, and process design (29,30).

The two most important factors are fatigue and stress. There is strong scientific evidence linking fatigue and performance decrement making it a known risk factor in patient safety (31).

Due to the relevance of human factors in healthcare, this area has been significantly developed through *human factor engineering,* a framework for efficient and constructive thinking which includes methods and tools to help healthcare teams perform patient safety analyses, such as root cause analyses (32).

The importance of human factors in the field of patient safety can be translated into three principles that guide the design of systems:

1. Prevent errors by designing systems that compensate for predictable human weaknesses, making it increasingly difficult to make mistakes at every step of the process.
2. Making errors visible, so that they can be intercepted.
3. Develop strategies to mitigate the effects of errors when they occur (33).

Human Factors Principles
The 8 key principles to consider are:

1. Avoid reliance on memory
2. Simplify
3. Standardize
4. Use constraints and forcing functions
5. Use protocols & checklists wisely
6. Improve information access
7. Reduce handoffs
8. Increase feedback

How can we help to reduce the risk?

Although you cannot completely avoid risks, all systems can be designed to minimize the occurrence of accidents and to minimize their harmful effects when they occur.

Improved safety focuses largely on the design of better systems and processes to improve the interaction between people and systems.

Here are some factors that may help reduce the risk of errors:

- The development of an environment conducive to continuous learning.
- Effective Leadership: The leader of a department or unit or the leader of an improvement team plays a critical role in maintaining patient safety (34).
- Teamwork: Good teamwork can reduce the problems of clinical safety and improve morale, and the viability of the team – consistent operation of the equipment over time (35).
- To ask for help from other team members – lack of experience or insufficient training are not signs of weakness.
- Improve verbal communication between the team and with patients and their families.
- Ensure that the work environment is comfortable (adequate lighting, noise control, cleanliness).
- Design equipment, devices, policies and procedures that are 'foolproof' and adapt to the knowledge and skills of the professionals who manage them.
- Change organizational culture in terms of making appropriate procedures in patient care easier and inappropriate ones difficult.

The Institute of Medicine says, "healthcare organizations must develop a culture of safety so that the design of all the processes and professionals have a clear objective: to dramatically improve the reliability and safety of care processes" (11).

Systems theory and the human factor

In the health sector it is often assumed that errors are due to incompetence, inattention or lack of responsibility of individuals and therefore the supervision of professionals is the key to improvement.

When addressing safety issues we find two possible approaches:

Person-centered approach, based on aspects such as:

- Little attention
- Lack of motivation
- carelessness and forgetfulness
- Malpractice
- Recklessness

This has undesirable reactions due to:

- Fear
- Disciplinary Measures
- Threat of criticism and accusation
- Blame and shame
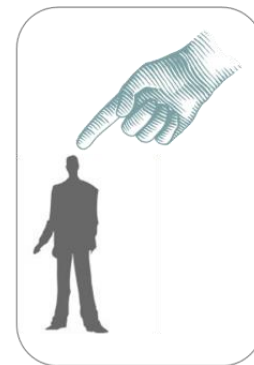
On the other hand the system-centred approach has a basic premise: humans are fallible and errors are to be expected, even in the best organizations.

Errors are seen as consequences, not only as causes, their origins can also be due to systemic factors.

The systemic approach is not to try to change the human condition but to change the conditions in which people work.

A central idea is to create defences (shields) in the system. Technologies that involve barriers, some mechanical such as alarms and physical barriers and others rely on the professionals themselves.

When an adverse event occurs it is not important who was wrong, but how and why the defences failed.

In recent years, the approach of addressing safety has changed to this systemic perspective.

As we have seen, the systemic approach replaces the blame by focusing on circumstances and by focusing on systems rather than individuals.

"The idea that medical errors are caused by inadequate systems
is a transformative concept" Lucian L. Leape

Lucian Leape gives great importance to the systems approach and suggests that, 85% of safety problems are attributed to system failures.

Don Berwick says "A system is perfectly designed to get the results it gets".

Facilities are often designed without considering predictable human error. In fact, many of the processes and technologies of health care are not designed to take into account human limitations.

Human error is the product of the same mental process used in day to day activities. In the course of a given day, the human mind has to make numerous perceptual functions (detect, identify and recognize sensory stimuli) and cognitive functions (using rules and strategies, memory, information processing, hypothesis formation and resolution problems) with a high level of accuracy and speed.

The human mind in an effort to be efficient in handling information, looks for the operating system. It is this efficiency requirement which causes the occurrence of errors, since the mind can select modes of operation which are not necessarily the best for a given situation.

Human performance can also be compromised by internal conditions (fatigue, illness, boredom) and external conditions such as (load, temperature, noise) (24).

Some research shows that when people are under pressure, they tend to respond in the most familiar way for them. This would be an involuntary human response (36).

Routine actions, biases and prejudices in the way information is collected may determine that clinical decisions are not the most appropriate. Prolonged experience does not seem a protective factor to avoid error, but lack of training, inexperience, fatigue, overwork accompanied by long hours of work and stress, are obvious risk factors.

Since working conditions can contribute directly to human performance and errors, it is better and easier to work to improve situational factors in the workplace than try to change human behaviour.

Therefore, as humans are fallible in nature, a person-centred approach could be ineffective. The guiding principle of the theory of human factors is: "We cannot change the human condition but we can change the conditions under which people work".

1.2 – Communication Errors

Learning Outcomes

- ✓ Explain the relation between adverse events and Communication errors
- ✓ Identify latent conditions in a handover process
- ✓ Identify risk factors of communication

Key messages for students

- 70% of sentinel event root cause attributed to communication errors
- Interdependency among professionals is important to ensure high quality outcomes and reduce patient safety risks

Communication as root cause of adverse events

Communication failure is considered a leading cause for sentinel events, according to the Joint Commission report showing 70% of sentinel event root cause attributed to communication errors (1). Communication breakdown is a crucial contributing factor for medical errors. As a result a large number of studies are conducted on poor communication in healthcare and its consequences. In addition, effective communication in healthcare has become one of the National Patient Safety Goals, and efforts have been made to develop tools for effective communication tools.

The Data Below is from the Joint Commission International Report on sentinel events, root causes by event type (37)*.*

Table 2: Root Cause Information for Delay in Treatment Events Reviewed by the Joint Commission (Resulting in death or permanent loss of function)

2004 through Jun 2013 (N=846) *The majority of events have multiple root causes*	
Communication	634
Assessment	619
Human Factors	545
Leadership	535
Information Management	247
Continuum of Care	212
Care Planning	141
Physical Environment	134
Medication Use	61
Patient Rights	20

Table 3: Root Cause Information for Elopement-related Events Reviewed by The Joint Commission (Resulting in death or permanent loss of function)

2004 through Jun 2013 (N=81) *The majority of events have multiple root causes*	
Communication	58
Assessment	55
Physical Environment	54
Leadership	53
Human Factors	41
Care Planning	17
Continuum of Care	11
Information Management	7
Special Interventions	7
Medication Use	5

Student activity 1.3

Objectives:
- Understand that a great amount of time at hospitals is spent on communication, whether with patients (taking history, examination, investigation, treatment, and discharge), nurses, doctors, other healthcare workers etc.
- Learn how communication error rises
- Understand the importance of communication in the healthcare setting
- Be aware of the various consequences associated with communication error (near miss – sentinel events)
- Understand the different methods of communication exist in hospitals; verbal, written, phone call, video call
- Understand that effective communication skills are crucial to ensure patient safety

Activity:
A student is given a statement to read, and then he/she must pass the information to the next student verbally and the next student must pass it to another student and so on. The last student who received the information/statement should say it out loud and then write it in a flipchart or board and compare it to - the original statement that was given to the first student – the result shows how much the original sentence has been altered.

Teamwork and communication error

Effective communication and sharing responsibility are essentials for establishing a culture of patient safety. Team work in healthcare is an interdependent collaboration between health professionals to provide care for the patient. The importance of teamwork in healthcare settings is rising and has received much attention recently due to a number of factors including the high prevalence of co-morbidities (two or more coexisting medical conditions) which demand multi-disciplinary and inter-disciplinary teams.

The current practice in healthcare is dominated by an individualistic approach rather than an inter-dependent teamwork approach. With the shortage of healthcare workers, the increased responsibility and complexity of healthcare, support and interdependence among professionals must occur to ensure high quality outcomes and reduce patient safety risks. This approach also creates a protected environment for healthcare professionals by providing a shared mental model and common ground.

Teamwork and Communication in healthcare are challenged by number of factors which include:

- Various levels of education and training of health care professionals create heterogeneity of communication style and insufficient shared understanding.
- Hierarchy in professional cultures especially between physicians and other health care professionals.
- Lack of training in non-technical skills and focusing solely on technical skills
- Different means of communication creates uncertainty of transferring the correct information.
- Human factors: fatigue, stress, noise
- Time pressure and workload
- Distraction and interruptions (38–41).

Student activity 1.4

Instructions:

Students are divided into two groups: the first group is asked to list the factors needed to be a SAFE doctor, and the second group to list the factors needed to ensure patient safety. Students must list as many factors as possible in 10 minutes and may need to explain some factors. ,, The group with the most factors is the winner.

This is followed by a group discussion on factors are the most important, and the role of these factors on a personal level and an organizational level.

Another group activity: give the group a patient safety statement (one of the statements that they have been taught in the chapter) and ask the group to draw it (come up with an idea that could transform the statement). Ask the group how did they reached agreement of what to draw and who did the drawing (enhance teamwork)

Transition and handover errors

Healthcare delivery involves various interactions and handover processes between different healthcare practitioners. For effective clinical practice critical information must be accurately conveyed.

Clinical handover is defined as "the transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis" (42).

Although clinical handover is conducted every day as a routine and traditional process, there is limited awareness of the importance of handover and the associated risk to patient safety. Poor handovers jeopardize patient safety and can lead to several consequences including unnecessary delays in diagnosis, treatment and care; repeated tests, missed or delayed communication of test results; incorrect treatment or medication errors; waste of resources, increase length of stay, increased in-hospital complications and decreased patient satisfaction (43–45).

Research showed that medical errors occur more often when there is a transition of care such as when healthcare providers communicate clinical information at shift change or when a patient is transferred (43).

Handover errors occur due to communication errors: when crucial patient information is wrong, missing, misinterpreted, or not appreciated (e.g., a pulmonary angiogram is performed in a patient with an elevated Creatinine level, but the radiologist is unaware that the patient has renal failure) (46).

Challenges to continuity of care:

- o   High numbers of patients under the care of a single team
- o   Frequent movement of patients between wards and departments
- o   Frequent movement of patients across different levels of care
- o   Frequent change of healthcare professionals in direct contact with the patient
- o   Lack of teamwork
- o   Involvement of multiple specialist teams
- o   Incomplete patient medical records

Clinical handover is a high risk scenario for patient safety. Associated dangers include discontinuity of care, adverse events and legal claims of malpractice (47). Clinical handover relevance is higher than ever as handover of clinical information occurs more frequently with the constant change in working shifts and the increase in clinical staff turnover.

Handover errors and professional's perceptions:

- A survey of Australian doctors revealed that 95% believed that there were no formal or set procedures for handover (48). Another Australian study of emergency department handover found that in 15.4% of cases, not all required information was transferred, resulting in adverse events (49).

- In the UK a survey of junior doctors discovered that 83% believe that handover processes were poor; written handover was rarely conducted, accounting for only 6% of all handovers (50).
- In the USA, a survey among trainees suggested that 15% of adverse events, errors or near misses involved handover (51). In fact, handover is among the most common cause of malpractice claims in the USA, especially among trainees, accounting for 20% of cases (52).

Types of handover

The major themes identified in the literature relating to high risk scenarios in clinical handover can be summarized as follows:

- Shift-to-shift medical handover
- Shift-to-shift nursing handover
- Handover to and from on call and night staff
- Ambulance to emergency department handover
- Inter-departmental transfer (e.g. A&E to Intensive Care Unit)
- Inter-hospital handover
- Hospital to community (secondary to primary care) handover
- Transfers within primary care
- Community to hospital (primary to secondary) handover i.e. referrals

There are several barriers that hinder the effectiveness of handover which cause the occurrence of medical errors. The current complexity of healthcare, advances in technology, the amount of information, the increase in sub-specialties, the large number of physicians and health workers involved in the care of one patient, have all lead to a rise in handover problems (53–55).

Some of the challenges for continuity of information and effective handover are:
- Human factors such as lack of shared understanding, interruption and distractions, doctors and health worker fatigue or incomplete and unclear communication.
- System Factors e.g. lack of standardization of clinical handover processes within organizations, lack of training, effect of hierarchy and power (defensive handover), frequent movement of patients between wards and departments sometimes without the doctor's knowledge.
- Other factors such as lack of time to provide or receive detailed handover, variable means of communication (phone call, electronic, face to face) (56,57).

Most of these challenges cannot be removed but they can be managed. The goal is to move towards system continuity, which requires mechanisms to support the transfer of high-quality clinical information across shift changes. These should include:

- Dedicated time in shifts for members of the team to meet, share information and clarify responsibility for ongoing care and outstanding tasks.

- Access to up-to-date summaries and management plans for all patients under a team's care.
- Reliable means to identify and contact the doctor who is responsible for a patient at any given time (42,55).

Systems to address handover errors are now quite prominent in the healthcare political agenda. Prevention of handover error is one of the five solution areas of the "High Five's Initiative", an initiative launched by the WHO in 2006 in collaboration with 7 countries to address continuing major concerns about patient safety around the world.

1.3 – How to improve Safety in the Handover Process

Learning Outcomes

- ✓ Knows the principles of handover
- ✓ Knows structure, schemas (ISBAR etc.) and how to decide which information is relevant
- ✓ Names acronyms and defines the meaning of each letter
- ✓ Knows tools to manage 'to Do's' or tasks for patients
- ✓ Knows where to find checklists for handover
- ✓ Applies learned schemas in clinical settings
- ✓ Is able to explain the meaning of schemas
- ✓ Is able to ask relevant questions when being in the receiver position
- ✓ Uses schemas in correct order and meaning
- ✓ Prepares for handover by prioritizing information correctly
- ✓ Makes a list of next steps for patient
- ✓ Is aware of several tools and schemas that can be used to prepare handovers
- ✓ Is aware of the need for time effectiveness
- ✓ Is willing to use/test structured handover tools in practice

Key messages for students

- Teams of all units must be involved in clinical handover
- Key people and a leader for clinical handover must be identified by each hospital
- A fixed time must be established for clinical handover
- A noise free location where handover take place must be considered
- A standardized handover should be introduced to each specific type of handover to ensure a complete information exchange
- Content of handover should include all patient's relevant information

The process of handover

Knowing the complexity of the handover process, the magnitude of the problem and the frequency of communication errors, several recommendations can be made for improving the safety of this process.

WHO should be involved?

> **Ideally, all members of the medical team-junior and senior staff (Consultant, Registrars, Resident, Senior resident, Nurse) should be involved. However each hospital needs to identify key people to attend handover.**

- Each hospital/unit needs to identify the key people who need to attend handover. Clinical Handover is equally important to **all members of the medical team**, both junior and senior. The ideal model includes all grades of staff from each included specialty, subspecialty or ward as appropriate. The nurse clinical coordinator should be involved in the major handover, usually the morning handover.
- Ideally, **teams from all units** should attend to ensure that they receive necessary patient information and make timely decisions about patient care and transfer. The multi-disciplinary or multi-specialty approach requires the greatest change in culture, but has the potential for the greatest benefits.

The involvement of **senior clinicians** is essential. This ensures that appropriate level management decisions are made and that handover forms a constructive part of medical education conveying the seriousness with which the organization takes this process. There will always be work that is ongoing during the handover time, especially in the evening. Virtually all aspects of care can wait for 30 minutes to ensure continued safety overnight. It is essential that individuals be allowed to attend, subject to emergency cover being defined.

The handover leader needs to ensure the team is aware of any new or locum members of the team and that adequate arrangements are in place to familiarize them with local systems and hospital geography.

WHEN should handover take place?
- Handover should be established at a fixed time, at each transition of care i.e. shift changes
- A major handover must be held in the morning which includes discussion of overnight cases, new admissions and planning the day's work
- The handover period should be known to all staff and designated 'pager-free' except for immediately life threatening emergencies
- Shifts for all staff involved must be coordinated to allow them to attend in working time. This is particularly important for the handover to, and from, the night team
- The main handover is generally held in the morning, however handover is also needed at the change of other shifts (for example 5pm in some ward settings). Morning handover allows the team to discuss overnight patient admissions, gives them a head start with their morning rounds and plans the day's work
- In addition to the larger, more formal handover, there will inevitably be smaller local handovers occurring daily (such as on ICU or admissions unit)
- As well as handover between shifts, doctors must conduct a thorough handover to ensure patient care is maintained if they are absent for extended periods, i.e. over weekends or while they are away on holidays

WHERE should handover take place?
- **Must be close to the working area like emergency unit or admission ward**
- **The venue should have enough space to comfortably accommodate handover attendees**
- **Location should be free from noise and distractions**
- **Location should have access to clinical information, internet and telephones**

HOW should handover happen?
- **Variable techniques of handover can be used according to the type of handover (shift to shift, unit to unit, etc.)**
- **A standardized handover should be introduced to each specific type of handover to ensure a complete information exchange**

- Information exchanged should be accurate and relevant
- Handover should be supervised by the most senior clinician present and must have clear leadership
- Ad hoc handovers often miss out important aspects of care and information

The Royal College of Physicians has published guidance on handover, relevant to general medical staff. Included in this document is an example of a handover sheet that can be used to facilitate effective information transfer between colleagues (42).

WHAT should be handed over?
All patients' relevant information which depend on factors such as severity of patient's illness and type of handover.

Student activity 1.5

Role Play
- Role play of handing over last night shift (written scenario), students should perform as a team containing registrar, senior resident, junior resident, house officer, and nurse. The rest of the class should comment and identify the correct and the missed/incorrect elements of how the handover process was performed

Strategies to improve safety of handover

An American study in Boston Children's Hospital showed that effective handover processes cause a remarkable reduction in medical errors and preventable adverse events (58). Considering that communication error is a vital cause of sentinel events, studies propose various procedures to improve clinical handover.

There is still no best practice of handover communication different methods are used at different levels. However, the implementation of standardized method for handover communication has been agreed on and recommended by WHO and Joint Commission International (59).

Forms/methods of handover

The way information is transmitted and recorded has a major impact on the handover process. Clinical handover occurs through different modalities, verbal, written, face to face, telephoned, taped, check list, electronic, and mobile apps.

Studies showed that the use of a verbal-only method is inadequate and prone to significant data loss. Whilst the use of careful note-taking during handover vastly improved the amount of information retained, the use of a pre-printed sheet containing important patient details almost entirely eliminated data loss during handover, but this process could be time consuming (60–62).

Taped handover is not the best practice and considered to be inappropriate, it should be replaced with timely verbal clinical handover, written clinical handover or both (63,64).

Improving communication and using tools

There are some key principles for effective communication that should be taken into account when improvement areas are detected:

- Complete: Transfer all relevant information
- Clear: Should be in understandable language
- Concise: transfer information briefly
- Timely: transfer information should be in an appropriate timeframe (38)

Attempting to address these principles, there are numerous tools developed to reduce teamwork and communication errors. For detailed information about several tools go to chapter 2.3 – Handover tools and structure (p.64ff).

Standardization of handover process

As handover occurs frequently in healthcare, understanding that each type of handover is for and how it should be presented is essential for ensuring confident and competent handover by all staff.

Standardizing handover process is by setting a common language when exchanging patient's information. It harmonizes practice, ensure effective, concise and complete communication in all clinical situations, help clarify the purpose and content of handover and reduce confusion, such an approach is needs to be easy to use so it can be easily taught and recalled (45,63).

Standardised tools must be developed by each hospital, includes multidisciplinary format that can be used wherever appropriate, can be modified for different occasions or according to the different types of clinical handover (shift to shift handover tools differs from hospital to community handover). Standardised scripts or cues in communication are available to assist in communication and documentation (63–65).

Patient Involvement in Clinical Handover

Patients are key stakeholders in clinical handover; patient involvement is a vital component of patient centered care which produces the most effective and highest quality of care. In addition of providing patients an opportunity to learn and engage in the management of their condition, treatment, follow up and satisfaction, it identifies areas requiring improvement that may not have considered by the workforce and may provide solutions to clinical issues. Patients are the common link in clinical handover and should be included and actively participate in the handover process, this participation enhance the effectiveness of clinical handover communication, and ensure high quality of healthcare (43,66,67).

Mechanisms to involve a patient and, where relevant, their carer in clinical handover is in use:

Establish mechanisms to involve patients and their carers in clinical handover Suggested strategies:

- Active participation of patients in the planning, delivery and evaluation of care
- Have a patient representative in the team during the handover process
- Form local policies and processes and describe how patients can be involved in clinical handover process (at the hospital level)
- Explore patient's concerns and their insights about handover, and consider their active role within the process
- Model clinical handover process as a patient centered approach
- Evaluate the level of understanding between care givers and the patients regarding the course of care, discharge date and post-discharge plans (43)

Student activity 1.6

Debate
- Students are divided into two groups for a debate, the first group supports standardized handover, and the other group opposes standardized handover. A winner is chosen.

A Power Point file is available for this topic.

Module 2 – Effective Communication

"The greatest problem with communication is the illusion that it has been accomplished".

George Bernard Shaw

Effective Communication

- Communication Theory
- Interprofessional communication and teamwork
- Tools and structure
- Various media in handover
- Administration of clinical content

As the Project's Training Needs Analysis showed, medical students do learn about communication but yet too rarely about structuring tools for handover procedures (3). Thus, the following chapter refers to communication theory, interprofessional communication and teamwork with focus on patient handover. Then it expands on communication tools and structures, communication via and supported by various media as well as the administration of clinical content in the context of patient handover.

2.1 – Communication Theory

Introduction

In this topic, students learn the impact of bad communication and therefore bad handover on patient safety and hospital effectiveness. After identifying – with the help of the teacher - aspects of good and bad communication in video examples, students become familiar with different models of communication and the importance of both 'sender' and 'receiver'. Special focus is put on "closed-loop communication", where the receiver reads back the message for the sender in order to make sure that the message is understood. Students also learn about the dangers of using ambiguous language and failure to identify patients properly. Students get the opportunity to perform a handover in a simulated setting and get feedback on communication skills, as well as the content and structure of their handover.

Learning Outcomes

- ✓ Gives examples of reasons for poor handover and communication and consequences of these
- ✓ Explains aspects of relevance of communication
- ✓ Extracts important aspects of communication models for clinical practice
- ✓ Recognizes ambiguous language
- ✓ Acknowledges the importance of patient identification
- ✓ Describes the model of closed-loop communication
- ✓ Names different influences of media on communication and related issues
- ✓ Explains how personal and professional bias influences information transfer
- ✓ Identifies examples of bad handover
- ✓ Performs handover in an efficient manner with unambiguous clinical language
- ✓ Identifies himself, recipient and patient during handover
- ✓ Uses closed-loop communication (e.g. check-back)
- ✓ Applies rules of effective communication
- ✓ Names consequences of bad handover
- ✓ Acknowledges the relevance of good communication skills in handover
- ✓ Shows respect for communication partner (patients, peers and professionals)

> **Key messages for students**
>
> - What is said is not automatically what is understood
> - Communication can have great impact on errors
> - Unambiguous language is relevant for successful communication
> - Closed-loop-communication assures understanding
> - Communication needs to be recipient-centered

Models of Communication

Communication is defined as interchanging information among people especially via speech or symbols (68). There are different Communication Theories applicable for Medical Handover. These are explained in detail below.

The Shannon-Weaver-Model of communication

The **Shannon–Weaver model of communication** has been called the "mother of all models" (69). It embodies the concepts of information source, message, transmitter, signal, channel, noise, receiver, information destination, probability of error, encoding, decoding, information rate, channel capacity, etc. (70).

While this model of communication was originally inspired by mathematical and technical needs, it is by now also very prevalent in the social sciences such as education, organizational analysis, and psychology. Critics highlight the simplicity as well as the inability to consider context and warn about misunderstandings (71).
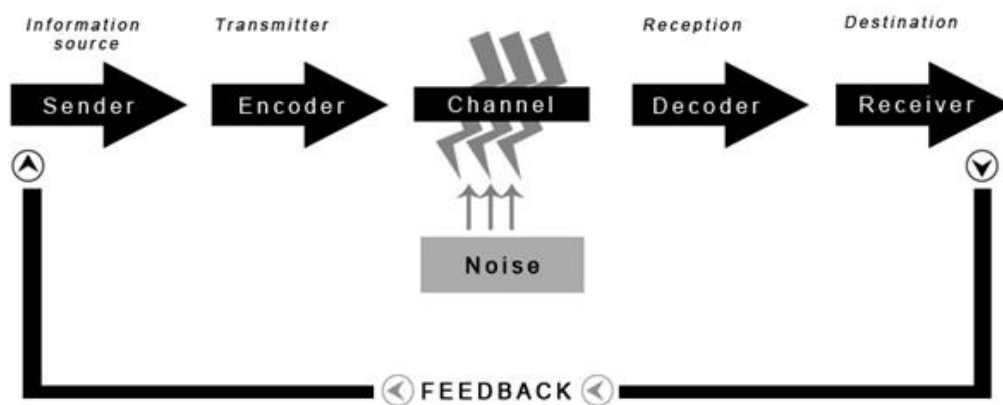
SHANNON-WEAVER'S MODEL OF COMMUNICATION

Figure 5: Sender-Receiver-Model (72)

It is true that the Shannon-Weaver-Model is a much too simple model for human communication. Still, it is a good basis for understanding the procedure of meaning and understanding. The principle of "Noise" has to be seen in a metaphorical way. The model talks about the message being "distracted or affected by physical noise" (72). Applied to face-to-face communication, noises like sounds of instruments or other people talking may be compromising communication, but noise also implies aspects of relationship between sender and receiver (for example hierarchy or culture) or the intonation of a word.

The 'Sender' is the originator of the message resp. the information source. He/she selects the desired message. The process of 'Encoding' means the selection of words as well as non- and paraverbal elements of the message.

The 'Receiver' is the destination of the message from the sender. He/she converts the signals into messages which are understandable for the receiver. This is called 'Decoding', the reverse process of encoding. Based on the decoded message, the receiver gives a feedback to the sender. Based on this feedback (which can be answering a questions, or just nodding or not reacting at all), the sender is able to interpret, if his intended message has been decoded correctly. The 'Noise' affects the effective communication.

Watzlawick´s Axioms of Communication:
Watzlawick postulates 5 **Axioms of Communication** (73):

1. *"One cannot not communicate."* Every behavior is a form of communication. People don´t only communicate by saying words. Even your posture and your facial expression are sending signals. The fact that you are not reacting to a message already gives a kind of feedback to the sender. One should always be aware of the impact of nonverbal and paraverbal aspects of communication.
2. *"Every communication has a content and relationship aspect such that the latter classifies the former and is therefore a meta-communication."*
   The relationship between the communicating people always influences and determines the context in which the message is understood. Meta-communication in this setting is information about information.
3. *"The nature of a relationship is dependent on the punctuation of the partners' communication procedures."* People construct their individual reality by giving meaning to certain events. In the process of communication, we always identify actions and reactions. The behavior and actions of other people are seen as causes for our own behavior and actions.
4. *"Human communication involves both digital and analogic modalities."* Digital communication refers to discrete, defined elements of syntax: words. Analogic modalities refer to gestures and facial expression, which often are much more appropriate to communicate something, for example a feeling or an attitude. Both modalities should always complement each other. If a facial expression doesn´t fit the semantic meaning of the words that are said, one has to question the speaker´s honesty.

5. *"Inter-human communication procedures are either symmetric or complementary, depending on whether the relationship of the partners is based on differences or parity."* A symmetric relationship is given when two persons are on the same hierarchical level concerning their communication. In a complementary communication, one person is domineering in a specific topic. The inferior position in this case does not have to be interpreted in a negative way. Both position often alter depending on the topic of communication.

The Laswell-Formula

Lasswell (1948) defined the formula: *„Who says what in which channel to whom with what effect?"* (74).

This verbal communication model is "a linear and uni-directional process"(75). The focus of the model is broken down by each element of communication: "*'who'* refers to the communicator who formulates the message; *'what'* is the content of message; *'channel'* indicates the medium of transmission; *'whom'* describes either an individual recipient or the audience of mass communication; *'effect'* is the outcome of the message..." (76). The movement of the message travels from the communicator to the audience. Although this model represents a one-way flow of communication, the 'effect' also refers to feedback in public relations (77).

Lasswell stated, the "Who" referred to "control analysis," the "Says What" referred to "content analysis," the "In Which Channel" referred to "media analysis," the "To Whom" referred to "audience analysis," and the "With What Effect" referred to "effect analysis" (74).

Independent from the theoretical model applied, risks and errors can occur on each described level: Sender, receiver, etc. These can be due to internal reasons (e.g. tiredness, lack of knowledge, etc.) or external causes (e.g. disturbances, technical issues, etc.). In Medical Handover, incorrect or ineffective communication often leads to delays in patient care or even patient harm. To properly react to these risks, the first thing is to follow certain principles of effective communication such as Grice's "Maxims". See also: Module 1 – Risk and Error Management (p.9ff).

Grice´s Cooperative Principle and Maxims of Conversation

The Cooperative Principle of Paul **Grice** states "Make your contribution such as it is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged" (78). This principle contains the following maxims.

<u>Maxim of Quantity</u>: Information

- Make your contribution as informative as is required for the current purposes of the exchange.
- Do not make your contribution more informative than is required.

Maxim of Quality: Truth

- Do not say what you believe to be false.
- Do not say that for which you lack adequate evidence.

Maxim of Relation: Relevance

- Be relevant.

Maxim of Manner: Clarity ("be perspicuous")

- Avoid obscurity of expression.
- Avoid ambiguity.
- Be brief (avoid unnecessary prolixity).
- Be orderly.

Student activity 2.1

Objectives:
Extract important aspects of communication models for clinical practice
Instructions:
Name the most important aspects of the above communication models and put them in context to the clinical setting. Imagine a handover situation and "translate" the theoretical information you just learned into practical guidelines for medical practitioners. Phrase your recommendations as Do´s and Don´ts for effective communication.

A Power Point file is available for this topic.

Unambiguous language in healthcare

As we have seen in module 1.2 – Communication Errors (p. 33), communication has a great impact on healthcare and patient safety. An important component of effective communication is the clarity of meaning.

Ambiguity exists when a term can reasonably be interpreted in more than one way, for example, the word "bank" can refer to a financial institution or a riverside. Vagueness occurs when the boundaries of a word's meaning are not well defined, as in the word "tall" (79). Vagueness also exists when a word or phrase reduces the level of information contained in a statement, as in stating that an action "may be appropriate"; this phrase reduces the clarity about whether or not the action should be performed.

Clinical Practice Guidelines for example are promoted as a means to decrease inappropriate practice variation and to reduce medical errors. To achieve this goal, they must use terms and phrases in a consistent manner and in an unambiguous way. Words like the above mentioned only lead to uncertainty and different kinds of interpretation.

Members of different clinical departments like surgeons, radiologist or physical therapists have their own organisational culture and professional background. This also includes a special way of communicating, an organisational "slang", if you will. Therefore, the interpretation of a term might vary in an interprofessional context. This is to be kept in mind when communicating to different professions during handover, also – and not least – during the communication with a patient or relatives.

Researchers have found a broad vocabulary of vague terms used in medical literature. Mosteller and Youtz for example have generated a "black list" of terms especially variable terms (80). The paper by Codish et al. "A Model of Ambiguity and Vagueness in Clinical Practice Guideline Recommendations" creates a framework for the development of tools to avoid ambiguity and vagueness in clinical context (81). Creating a controlled vocabulary of vague terms has the potential to reduce variable interpretation.

Student activity 2.2

Objectives:
Recognizes ambiguous language
Instructions:
Brainstorm terms of every-day use that you perceive to be vague or ambiguous and discuss different possible interpretations. Make suggestions for more discrete terms.

Closed-loop communication

Closed loop communication is a communication technique used to avoid misunderstandings. When the sender gives a message, the receiver repeats this back. The sender then confirms the message. When the receiver incorrectly repeats the message back, the sender knows that he/she hasn´t been understood correctly and repeats the message, maybe even in another way. If the receiver does not give any feedback, the sender has to assume that he didn´t hear, and has to repeat the message, too. To get the attention of the receiver, the sender can use the receiver's name or functional position, or use nonverbal means like touching arm or shoulder.
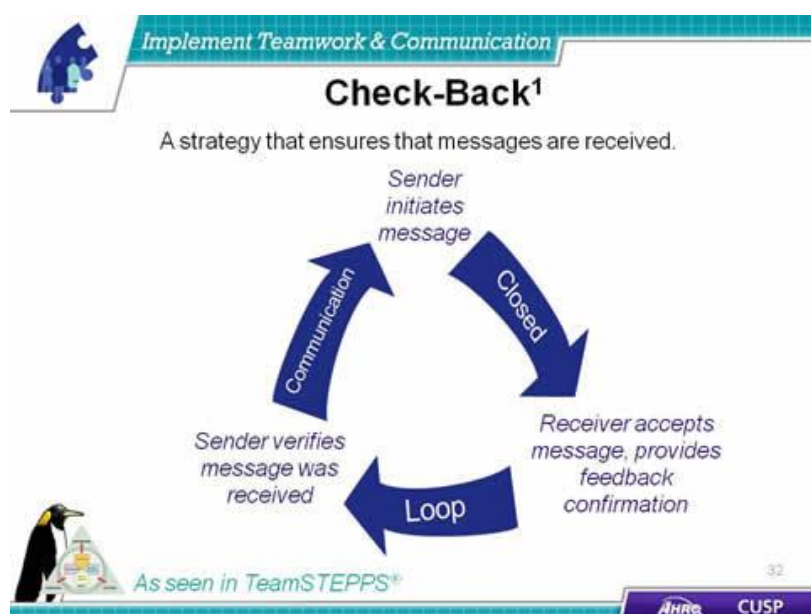
Figure 6: Slide from the CUSP Toolkit explaining closed loop communication in a Check-Back Scenario (82)

Closed-loop communication originally was adapted from the field of aviation and the development of team training concepts, like Crew Resource Management (83,84). In this case the verbal feedback is of great importance to ensure that the team members correctly understand the message. In practice, communication is not as simple and clear but more complicated and affected by several other factors. But studies show that in aviation high-performing teams use feedback more frequently and repeated commands more often than low-performing teams (85). Transferring this to clinical practice it was show that in an simulated emergency case, teams that described in clear terms the emergency and used feedback were more efficient in completing critical tasks than teams that were ambiguous in their communication (86). By this, the use of closed-loop communication affects patient safety and can therefore be considered a necessary component to ensure and facilitate safe team communication.

On the AHRQ TeamSTEPPS® website, there are short videos available, among other things illustrating closed-loop communication:

http://www.ahrq.gov/professionals/education/curriculum-tools/teamstepps/instructor/videos/ts_checkback/checkback.html

Recipient-centered communication

It is observable and all the same remarkable that we are able to adjust our verbal and non-verbal communication to different addresses. This phenomenon is called *recipient design*. But the question *how* we learn to tune our communicative behaviour is not yet clearly answered. It seems to be related to perspective taking rather than more simple heuristics (87).

In healthcare recipient-centered communication is mostly implemented in a patient-centered approach, aiming to improve understanding and satisfaction on the patients' side. A narrative review reveals six aspects of "best practice" on the physician's side: 1. fostering the relationship, 2. gathering information, 3. providing information, 4. making decisions, 5. responding to emotions, and 6. enabling disease- and treatment-related behaviour (88).

For more information see also the chapter 'Patient Involvement in Clinical Handover' (p.44). But in terms of handover recipient-centered communication refers also to interprofessional communication and teamwork, which is addressed in Chapter 2.2 – Interprofessional Communication and Teamwork (p.55ff).

Student activity 2.3

Objectives:
Understand and use closed-loop communication
Instructions:
Let the students perform a closed-loop communication with fictive examples and try out different possibilities of getting a receiver´s attention.

2.2 – Interprofessional Communication and Teamwork

Introduction

To begin with, students generate a list of healthcare professions – both inside and around the hospital – and investigate their competencies, roles and values. They get to know the journey of a patient through the hospital, from admission to discharge, and learn to see the whole picture. They list examples for interprofessional handover situations and how each participant must be included. They learn the most important aspects of teamwork and their impact on patient safety and error management. Interprofessional handover situations are conducted during role play with changes of perspective.

Learning Outcomes

- ✓ Name other disciplines involved in handover and name their 'duties' for the patient
- ✓ Knowledge of biases in interprofessional communication
- ✓ Name strategies to prevent communicational errors due to interprofessional context
- ✓ Know which information is important for which partner of the 'handover' team
- ✓ Is able to phrase information according to colleague's background/ discipline
- ✓ Is able to give feedback in handover
- ✓ Involves relevant partners in handover
- ✓ Is able to listen, pay attention and give check-back in handover
- ✓ Is aware of the importance of patient involvement
- ✓ Is aware of importance of working effectively with other disciplines together to assure good outcomes without unnecessary mistakes
- ✓ Accept different perspectives (or point of view) from different healthcare disciplines

Key messages for students

- Healthcare professionals vary in terms of competencies, roles and values.
- Interprofessional teamwork affects communication.
- The organizational culture is relevant to team communication.
- Giving and receiving feedback is an important skill.
- The patient plays a significant role.
- Other professional and their work have to be respected.
- There are certain aspects of teamwork affecting communication and patient safety.

Different professions in the hospital environment

Jobs in hospitals are not just confined to nurses and doctors. In fact, with the development in science and technology, several specialized jobs have emerged. Online one can find extensive lists of different professions working in a hospital (89):

Doctors: Doctors form an important part of the hospital sector. Doctors take a history and examine patients, order investigations, and diagnose and treat patients. There are many specialized doctors, who help in the detection and treatment of many diseases and disorders with the help of advanced technology:

- Ophthalmologist
- Radiologist
- General Practitioner
- Pathologist
- Psychiatrist
- Pediatrician
- Gynecologist
- Anesthetist

- Nutritionist and Dietitian
- Immunologist
- Oncologist
- Neurologist
- Endocrinologist
- Cardiologist
- Epidemiologist

Medical Assistance: Although these types of hospital jobs have been in existence for a long time, they have been categorized as allied medical services or supportive medical services:

- Occupational Therapist
- Surgical Technologist
- Medical Assistant
- Physician Assistant
- Kinesiologist

- Respiratory Therapist
- Chiropractor
- Health Educator
- Dermatologist
- Pharmacist

Dental Section: One of the most preferred and 'in demand' jobs in hospitals is the job of a dentist:

- Dentists
- Dental Technicians
- Dental Nurses
- Dental Therapists

Therapy Services: Therapy services mainly include providing various therapies to patients to ease mental as well as physical disorders:

- Occupational Therapist
- Chiropractic
- Recreational Therapist
- Psychiatric Technician
- Speech-Language Pathologist

Nursing: Nursing involves direct contact with the patient and taking care of the patient. Nurses may work in the following areas:

- Acute Care
- Operating Room
- Maternity
- Occupational Health
- Ambulatory Care Services
- Emergency Services
- Geriatric Services
- Community Health Services
- Critical Care Services

Patient Care and Health Care Services: Patient care and health care services are jobs that involve information services, social and supportive working and maintaining patient relations. Such jobs include.

- Medical Record Maintenance
- Call Centers and Help Desks
- Patient Relations Management
- Transcriptionists
- Communication Services

Hospital Administration Jobs: A hospital is an organization and with medical records and accounts, and needs to take care of the employees, foster relations with suppliers and contract personnel. Hospital administration jobs include:

- Administrative Service Managers
- Human Resource Manager and Executives
- Accounting Head and Clerks
- Purchase Officers
- Operational Managers

Student activity 2.4

> **Small group discussion**
>
> Instructions:
>
> First the students write down by themselves all kinds of professions they might collaborate with as future doctors. Then they discuss in small groups:
>
> - What professions came first to your mind?
> - What professions did you miss (compare with list)?
> - What do you know about these professions' area of work, education, special knowledge, every day work, etc.?

Interprofessional Communication and Collaboration

In the field of healthcare O'Daniel and Rosenstein define collaboration as "healthcare professionals assuming complementary roles and cooperatively working together, sharing responsibility for problem-solving and making decisions to formulate and carry out plans for patient care" (41,90,91).

Verhovsek et al. did a literature review on interprofessional communication and collaboration (92) and refer to Pippa (93,94) when stating that, beliefs, attitudes, customs, and behaviours form the unique culture of each health care profession and evolve over time, reflecting historic factors, as well as the current environment and educational requirements. Different educational experiences and socialization processes enable the development of such a culture. Each profession forms common values, problem-solving approaches and language/jargon already during training and transcend these into workplace after graduation.

Especially in times of demographic change, more complex knowledge and skills are required to properly address the aging population and patients with chronic illnesses. This has led to an increase in specialization of healthcare disciplines and may have decreased interdisciplinary exchange. Within one discipline communication is facilitated by specialized vocabulary, similar approaches to problem solving, common interests, and understanding of issues. Also communication with members of other healthcare disciplines becomes increasingly difficult as the cognitive map developed through professional education and socialization becomes more ingrained.

Northouse and Northouse (95) identified three problem areas that hinder interprofessional communication: role stress, lack of interprofessional understanding and struggle for autonomy.

O'Daniel and Rosenstein (41) list the following aspects as barriers to interprofessional communication and collaboration:

Table 4: Common barriers to interprofessional communication and collaboration (41)

- Personal values and expectations
- Personality differences
- Hierarchy
- Disruptive behavior
- Culture and ethnicity
- Generational differences
- Gender
- Historical interprofessional and intraprofessional rivalries
- Differences in language and jargon
- Differences in schedules and professional routines
- Varying levels of preparation, qualifications, and status
- Differences in requirements, regulations, and norms of professional education
- Fears of diluted professional identity
- Differences in accountability, payment, and rewards
- Concerns regarding clinical responsibility
- Complexity of care
- Emphasis on rapid decisionmaking

Despite these barriers and challenges, it is obvious that collaboration and teamwork is essential for a successful patient care, because conflicts and inaccuracy jeopardise patient safety. When considering teamwork in health care, only an interdisciplinary approach is suitable. An interdisciplinary approach associates a common goal from all disciplines involved in the patient's care plan. This has to be delineated from a multidisciplinary approach, in which each member of a team only is responsible for the activities related to his or her own discipline and formulates separate goals for the patient.

O'Daniel and Rosenstein (41) name the following components as essential for successful teamwork:

Table 5: Components of Successful Teamwork (41)

- Open communication
- Nonpunitive environment
- Clear direction
- Clear and known roles and tasks for team members
- Respectful atmosphere
- Shared responsibility for team success
- Appropriate balance of member participation for the task at hand
- Acknowledgment and processing of conflict
- Clear specifications regarding authority and accountability
- Clear and known decisionmaking procedures

> - Regular and routine communication and information sharing
> - Enabling environment, including access to needed resources
> - Mechanism to evaluate outcomes and adjust accordingly
>
> (...)

Establishing Culture to Support Communication and Team Collaboration
(41)

A team is different from a group of people regarding most notably, a common culture. A group of people only acts as a team, if they pursue a common goal, have the same understanding of the purpose and the vision of their work.

Team members need to know their own role and function in the team as well as the one of the others. This knowledge is important for effective teamwork because it prevents discussions and team members feeling ignored in their competence.

This is why a clear and open communication is the basis for all teamwork. Ideally, team members have time to get to know each other and their roles and talents. Procedures and routines can be negotiated before the action and not in between.

Team members watch out for each other.

Addressing defects in communication that affect collaboration, information exchange, appreciation of roles and responsibilities,

Clinical and administrative leaders must set the tone by establishing and adhering to behavioral standards that support agreed-upon code of conduct practices backed by a non-punitive culture and zero-tolerance policy.

Assessment information can be gained from formal methods such as incident reports, survey tools, focus groups, department meetings, task forces or committees, direct observation, suggestion boxes, and hot lines.

Creating opportunities for different groups to just get together is a highly effective strategy for enhancing collaboration and communication. These group interactions can be either formal or informal. Encouraging open dialogue, collaborative rounds, implementing preop and postop team briefings, and creating interdisciplinary committees or task forces that discuss problem areas frequently provides an upfront solution that reduces the likelihood of disruptive events.

Developing and implementing a standard set of behaviour policies and procedures is vital. These policies need to be consistent and universally applied. There should not be a separate policy for any one particular discipline or service. For the medical staff, the policies should become part of the medical staff bylaws with signed agreements to abide by these policies at the time of appointment and recredentialing. Included in the policies should be a standardized

protocol outlining expected standards and the process for addressing disruptive behaviour issues, recommendations, follow-up plans, and actions to be taken in the face of individual resistance or refusal to comply. Prior to implementation, all employees should be familiar with the existence, purpose, and intent of the policies and procedures.

The organization needs to address issues related to confidentiality, fear of retaliation, and the common feelings that there is a double standard and that nothing ever gets done. Reporting mechanisms should be made easy and must be supported by the presence of a non-punitive environment. The ideal vehicle for reporting is to address the situation in real time, but concerns about position, appropriateness, receptiveness, fear, hostility, and retaliation are significant impediments (96).

Besides maintaining confidentiality and reducing risks of retaliation, one of the most crucial aspects of the reporting system is to give recognition and assurance that the complaints will be addressed and actions will be taken.

Appropriate topics should include sessions on team dynamics, communication skills, phone etiquette, assertiveness training, diversity training, conflict management, stress management, and any other courses necessary to foster more effective team functioning and communication flow. Courses should be offered to all staff and employees at the organization: physicians, physicians in training, nurses, nursing students, and all other staff who have patient contact or play a role in the delivery of patient care.

Another important strategy is to promote and assure competency training at all levels of the health care team. This is a key factor affecting trust and respect, which have such a strong influence on team collaboration.

Focused team training programs have been of particular value. One of the newer approaches to improving team collaboration and patient safety is through the principles learned from the aviation industry. Fostering an environment of trust and respect, accountability, situational awareness, open communication, assertiveness, shared decision making, feedback, and education, interdisciplinary CRM training has brought significant improvements to communication flow in the perioperative setting (97,98).

Having a clinical champion or early adopter who actively promotes the importance of appropriate behaviour, communication, and team collaboration can be an extremely valuable asset.

Team satisfaction

One could question why team satisfaction is important in terms of handover and patient safety. The Institute for Healthcare communication summarizes research answering this question (99):

- Communication among healthcare team members influences the quality of working relationships, job satisfaction and impacts on patient safety (100).
- When communication about tasks and responsibilities are done well, research has shown significant reduction in nurse turnover and improved job satisfaction because it facilitates a culture of mutual support (101,102).
- Larson and Yao found a direct relationship between clinicians' level of satisfaction and their ability to build rapport and express care and warmth with patients (103).

They also list the following elements that contribute to healthcare team satisfaction: Feeling supported, e.g., administratively and inter-personally, respected, valued, understood, listened to, having a clear understanding of role, work equity and fair compensation.

Student activity 2.5

Small group discussion [referring to (104)]

Instructions:
- Outline a patient's "journey" from the time he/she enters a health care facility e.g., acute care, complex continuing care, primary care, to the time he/she is discharged and/or leaves the facility
- Identify all the steps and types of healthcare professionals involved in managing the care of that patient
- Focus on the types of communication used throughout the patient's journey.

Conflict resolution

According to the WHO (105) the ability to resolve conflict or disagreement in the team is the "key to successful teamwork". Conflict resolution often requires compromise, "embracing the others' perspective and rethinking the initial formulation"(106). Therefore a team atmosphere is needed, that allows everyone to speak up and express concerns. Especially for junior members of the team, such as medical students, or in teams that are highly hierarchical in nature this can be challenging.

The WHO (105) suggests the following protocols that have been developed to help members of a team express their concern in a graded manner.

Two-challenge rule

The two-challenge rule is designed to empower all team members to "stop" an activity if they sense or discover an essential safety breach. There may be times when an approach is made to a team member but is ignored or dismissed without consideration. This will require a person to voice his or her concerns by restating their concerns at least twice, if the initial assertion is ignored (thus the name "two-challenge rule").

These two attempts may come from the same person or two different team members:

- the first challenge should be in the form of a question:
  e.g. "I am worried about Mrs Jones in bed 23. She looks unwell and her symptoms are different to those she normally presents with. Can you have a look at her?"
- the second challenge should provide some support for the team members' concern:
  e.g. "I am really worried about Mrs Jones. Her symptoms are worrying me. I think she needs to be seen now."

Remember this is about advocating for the patient—the "two-challenge" tactic ensures that an expressed concern has been heard, understood, and acknowledged.

The team member being challenged must acknowledge the concerns.

If this does not result in a change or is still unacceptable, then the person with the concern should take stronger action by talking to a supervisor or the next person up the chain of command.

CUS

CUS is shorthand for a three-step process in assisting people in stopping the activity.

- I am **C**oncerned
- I am **U**ncomfortable
- This is a **S**afety issue

DESC Script

DESC describes a constructive process for resolving conflicts.

- **D**escribe the specific situation or behaviour and provide concrete evidence or data.
- **E**xpress how the situation makes you feel and what your concerns are.
- **S**uggest other alternatives and seek agreement.
- **C**onsequences should be stated in terms of impact on established team goals or patient safety. The goal is to reach consensus.

2.3 – Handover tools and structures

Introduction

Students learn various mnemonics and checklists and the basic structure of handover. For the use of these structures in practice, the students are equipped with mobile devices and the relevant apps. Handover tools can be trained and used in simulated settings as well as with real patients.

Learning Outcomes

- ✓ Knows structure, schemas (ISBAR etc.) and how to decide which information is relevant
- ✓ Names acronyms and defines the meaning of each letter
- ✓ Knows tools to manage 'to Do's' for patients
- ✓ Knows where to find checklists for handover
- ✓ Applies learned schemas in clinical settings
- ✓ Is able to explain the meaning of schemas
- ✓ Is able to ask relevant questions when being in the receiver position
- ✓ Uses schemas in correct order and meaning
- ✓ Prepares for handover by prioritizing information correctly
- ✓ Makes a list of next steps for patient
- ✓ Is aware of several tools and schemas that can be used to prepare handovers
- ✓ Is aware of the need for time effectiveness
- ✓ Is willing to use/test structured handover tools in practice

Key messages for students

- Relevance of standardization and checklists
- Handover tools
- Essential framework for handover
- Closed-loop communication
- Mobile devices

Relevance of standardization and checklists

Standardized procedures have a great impact on patient safety. With focus on communication in healthcare checklists for example can structure a handover, discharge plan and suchlike. It has been shown that these not only make it easier for those involved but also affect the patients' outcome. For further resources and information go to Module 1 – Risk and Error Management.

Various tools in handover

There are different tools, esp. checklists and mnemonics, which were developed to improve and facilitate handover processes. They can be modified according to regional or area-specific requirements. Evaluation studies approved a good applicability and benefit for patients' outcome (58,107). Following, several of these tools will be presented.

SBAR

SBAR is a structured method for communicating critical information that requires immediate attention and action. It improves communication, effective escalation and increased safety. Its use is well established in many settings including the military, aviation and some acute medical environments.

SBAR has 4 steps:

S	Situation – What is the situation?(Chief complaint, current status)
B	Background – What is the clinical background? (Previous history)
A	Assessment – What is the problem? (Results of assessment, vital signs and symptoms)
R	Request/recommendation – What do I recommend/request to be done? (Suggested and anticipated changes, critical monitoring)

Situation:
I am (name), (X) a nurse on ward (X)
I am calling about (patient X)
I am calling because I am concerned that…
(e.g. BP is low/high, pulse is XX temperature is XX,
Early Warning Score is XX)

Background:
Patient (X) was admitted on (XX date) with
(e.g. MI/chest infection)
They have had (X operation/procedure/investigation)
Patient (X)'s condition has changed in the last (XX mins)
Their last set of obs were (XX)
Patient (X)'s normal condition is…
(e.g. alert/drowsy/confused, pain free)

Assessment:
I think the problem is (XXX)
and I have…
(e.g. given O₂/analgesia, stopped the infusion)
OR
I am not sure what the problem is but patient (X)
is deteriorating
OR
I don't know what's wrong but I am really worried

Recommendation:
I need you to…
Come to see the patient in the next (XX mins)
AND
Is there anything I need to do in the meantime?
(e.g. stop the fluid/repeat the obs)

Ask receiver to repeat key information to ensure understanding

The SBAR tool originated from the US Navy and was adapted for use in healthcare by
Dr M Leonard and colleagues from Kaiser Permanente, Colorado, USA

Figure 7: Acute SBAR Card (108)

For further resources about SBAR (e.g. posters, film and e-learning module) visit:

http://www.institute.nhs.uk/safer_care/safer_care/situation_background_assessment_recommendation.html

http://www.ahrq.gov/professionals/education/curriculum-tools/teamstepps/instructor/videos/ts_SBAR_NurseToPhysician/SBAR_NurseToPhysician-400-300.html

ISBAR

ISBAR (Identify, Situation, Background, Assessment and Recommendation) is a mnemonic created to improve safety in the transfer of critical information. It originates from SBAR, the most frequently used mnemonic in health and other high risk environments such as the military. The "I" in ISBAR is to ensure that accurate identification of those participating in handover and of the patient is established.

I	Introduction – I am
S	Situation – What's going on
B	Background – Brief relevant history
A	Assessment – What I think is happening
R	Recommendation – What you are asking them to do

Figure 8: ISBAR Lanyard Card (109)

For further resources about ISBAR (e.g. fact sheets, app, demonstration video) visit:

http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/clinical+resources/safety+and+quality/clinical+handover/isbar+-+identify+situation+background+assessment+and+recommendation

https://itunes.apple.com/au/app/isbar/id465890292?mt=8

http://nswhealth.moodle.com.au/DOH/DETECT/content/00_worry/when_to_worry_06.htm

iSoBAR

For the iSoBAR Checklist the SBAR tool was modified and expanded to better fit the local context of the Western Australian Country Health Service (WACHS). The tool "iSoBAR" is now both a word and a mnemonic, which had resonance in the state's cyclone-prone north-west. The checklist has two additional prompts compared with the original SBAR. Firstly, the "i", for "identify yourself and the patient", placed the patient's identity, rather than the diagnosis, in primary position and also provided a method of introduction. (This is particularly important when teams are widely spread geographically.) The second new prompt, "o" for "observations", was included to provide an adequate baseline of factual information on which to devise a plan of care. "S" ("situation") and "B" ("background") were unchanged, but "A" ("assessment") was changed to "agreed plan" and "R" ("recommendation") was changed to "read back" to reinforce the transfer of information and accountability.

iSoBAR: a handover "how to"

i	IDENTIFY	Introduce yourself and your patient
S	SITUATION	Why are you calling? Briefly state the problem
o	OBSERVATIONS	Recent vital signs and clinical assessment
B	BACKGROUND	Pertinent information related to the patient
A	AGREED PLAN	What needs to happen? Assessment of the situation
R	READ BACK	Clarify and check for shared understanding. Who is responsible for what and by when?

Figure 9: iSoBAR marketing material (110)

i	*Identify – Introduce yourself and your patient*
	This step, which ensures patients are correctly identified, should include three identifiers: for example, patient name, date of birth and medical record number.
S	*Situation – Why are you calling? Briefly state the problem*
	This step includes the patient's current clinical status (e.g. stable, deteriorating, and improving), advanced directives and patient-centred care requirements including the prospect of discharge or transfer.
o	*Observation – Recent vital signs and clinical assessment*
	This step ensures the incoming team is informed of the latest observations of the patient and when they were taken. It serves as a checking mechanism to identify deteriorating patients for emergency response assistance. Unit members need to be aware of local emergency response call criteria and process.
B	*Background – Brief relevant history*
	This step provides the incoming team with a summary of background; history (the presenting problem, background problems and current issues); evaluation (physical examination findings, investigation findings and current diagnosis); as well as management to date and whether it is working.
A	*Agree to a plan – Given the situation, what needs to happen?*
	This step is to ensure that all tasks and abnormal or pending results are clearly communicated. Most importantly, there must be an established and agreed management and escalation of care plan, which could include: - a shared understanding of what conditions are being treated or, if the diagnosis is not known, clear communication of this fact to everyone - tasks to be completed abnormal or pending results (must include recommendations and the agreed plan and who to call if there is a problem) - a plan for communication to the senior in charge - Clear accountability for actions.
R	*Read back – Confirm shared understanding, who is doing what and when*
	Clinical handover must include the transfer of responsibility as staff is leaving the institution. This can only be achieved through acceptance of tasks by the incoming team, which is best ensured by face-to-face handover. Where risks are identified for a patient, clinical risk management strategies (such as for infectious disease alerts or alerts for DVT prophylaxis) should be clearly communicated. - Responsibility transfer and task acceptance ideally includes accepting handover sheets or signing of handover sheets. - Read back of critical information is helpful, especially in situations where face-to-face handover is not possible. - Risks and management plans should be included in handover when required (111).

For further resources about iSoBAR (e.g. forms, promotional materials and e-learning toolkit) visit:

http://www.safetyandquality.gov.au/our-work/clinical-communications/clinical-handover/national-clinical-handover-initiative-pilot-program/isobar-for-inter-hospital-transfers/

SHARED

Figure 10: SHARED illiustration (112)

S	Situation
	• Who are you?
	   o Name
	   o Designation
	   o location
	• Why are you communicating?
	   o Reason for admission/phone call
	   o Change in condition
	• Who are you communicating about?
	   o Patient name
	   o Diagnosis specific information

H	History
	• Important information relevant to patient's current presentation.
	   o Antenatal/obstetric
	   o Medical
	   o Surgical
	   o Psychosocial
	   o Recent treatments, responses and events

A	Assessment
	• Relevant to current presentation; observations, tests, assessments & their results.
	   o Results
	   o Blood tests
	   o X rays/scans
	   o Observations
	   o Condition severity

R	*Risk*
	 • Relevant & important information to keep the patient safe.
	      o Allergies
	      o Infection control
	      o Literacy/cultural
	      o Drugs
	      o Skin integrity
	      o Mobility/falls

E	Expectation
	 • What needs to be done?
	      o Plan of care
	 • In what timeframe & by whom?
	      o Patient
	      o Midwife/nurse
	      o VMO
	 • Anticipated responses & outcomes
	      o Expected outcomes
	      o Discharge plan
	 • "Speaking Up For Safety"
	      o escalation

D	Documentation
	 • Important & relevant information written in the appropriate clinical record.
	      o Progress notes
	      o Care paths
	      o Electronic systems/databases

ANTICipate

Another acronym summarizing the components of a safe and effective handover is "ANTICipate":

A	Administrative data (e.g., patient's name, medical record number, and location)
N	New clinical information must be updated
T	Tasks to be performed by the covering provider must be clearly explained
I	Illness severity must be communicated
C	Contingency plans for changes in clinical status must be outlined, to assist cross-coverage in managing the patient overnight

Find an article about ANTICipate from the patient safety network (PSNet) on: http://psnet.ahrq.gov/primer.aspx?primerID=9

I PASS the BATON

Using the Situation-Background-Assessment-Recommendation (SBAR) technique as a guide may facilitate the documentation process, as necessary. Such information as code status, psychosocial status, family issues, and long-term care issues also may be included as circumstances warrant.

I	Introduction: Introduce yourself and your role/job (include patient)
P	Patient: Identifiers, age, sex, location
A	Assessment: Present complain, vital signs, symptoms and diagnosis
S	Situation: Current status/circumstances, including code status, level of uncertainty, recent changes, and response to treatment
S	Safety: Critical lab values/reports, socio-economic factors, allergies and alerts (falls, isolation)

Figure 11: I PASS the BATON Poster (113)

For further resources about I PASS the BATON (e.g. video) visit:

http://www.ahrq.gov/professionals/education/curriculum-tools/teamstepps/instructor/videos/ts_passTheBaton/passTheBaton-400-300.html

http://www.ahrq.gov/professionals/education/curriculum-tools/teamstepps/instructor/fundamentals/module6/slcommunication.html

Briefing and debriefing

Briefing: is a discussion between team members that identifies team member's role and responsibility after introducing names, explain major steps, and check critical treatment and equipments.

Briefing promotes awareness for the current situation, allows team to interpret and get prepared for the unexpected situations by asking "what if", and creates shared mental understanding.

- Introduce names and roles
- Define objective
- Identify major steps
- Check critical treatment and equipment
- Ask "What if?"
- Check understanding by 'read back'
- Preview the debrief (i.e. discuss what you will talk about in the debrief).

Debriefing: Is a brief discussion that follows an event to identify what happened and point out what could have been done better. It is a learning process, and could be used for generating solutions and improving performance.

It answers questions such as: How did we do? What went well? And what should we do next time?

- "How did we do?"
- "How did we feel?"
- "What went well?"
- "What went not so well?"
- "What should we do next time?"www.patientsafetyfirst.nhs.uk 25
- "How did we do?"
- Team leader sums up at the end of the debrief to reiterate what has been discussed
- Debriefing also checks that there is a shared understanding in the team.

Other tools and strategies

TeamSTEPPS® (a system to improve institutional collaboration and communication relating to patient safety developed jointly by the US Department of Defense (DoD) and the Agency for Healthcare Research and Quality (AHRQ)) provides some more helpful strategies to structure and enhance patient handover. Several video sequences are available on the TeamSTEPPS website that illustrates the different approaches:

- Huddle (Flash video, 31 sec.)
- I PASS the BATON (Flash video, 1 min., 14 sec.)
- Feedback (Flash video, 29 sec.)
- SBAR (Flash video, 1 min., 35 sec.)
- STEP (Flash video, 38 sec.)
- Handoff (Flash video, 1 min., 36 sec.)
- Check-Back (Flash video, 15 sec.)
- Brief (Flash video, 36 sec.)
- Call-Out (Flash video, 18 sec.)
- Cross Monitoring (Flash video, 18 sec.)
- CUS (Flash video, 10 sec.)
- Debrief (Flash video, 24 sec.)
- DESC Script (Flash video, 1 min., 49 sec.)

Find the videos at:

http://www.ahrq.gov/professionals/education/curriculum-tools/teamstepps/instructor/videos/index.html

Closed-loop communication

The concept of closed-loop communication can also help avoid misunderstandings and by this increase the quality of handover and reduce the risk of patient harm. For details about closed-loop communication, go back to chapter 2.1 – Communication Theory, Closed-loop communication (p.53).

Mobile devices

Mobile devices can be used during handover to structure or to take notes and by this to ensure the information, which is handed over, is complete.

There are specific applications available to ease different kinds of handover or patient transitions as well as applications using the tools introduced before. For further information go to chapter 2.4 – Various media for Handover (p.75).

Students' activity 2.6

Dyad exercise

Instructions:
- Choose one of the standardized handover tools and prepare a structured handover using information from a fictional patient case (provided by the teacher).
- Hand the patient's information to each other and give feedback.
- Discuss advantages and disadvantages of the selected tools.

Education and Culture DG

Lifelong Learning Programme

2.4 – Various media for Handover

Introduction

After learning the essential content and structure of handover, students deal with the impact of various media on communication and the use of different media in handover. They learn rules and risks of written documentation and handover via telephone (especially the importance of paraverbal communication). Students perform different forms of handover with the help of mobile devices and document their handover.

Learning Outcomes

- ✓ Knows how different media can change the relevance of information that needs to be transferred (with examples)
- ✓ Can give examples on adaption of language when using different media
- ✓ Can name several media that can be used during handover
- ✓ Can list pros and cons of each method
- ✓ Can write precise documentation/ letter of discharge/…
- ✓ Can apply technical tools in handover process
- ✓ Can give handover on the telephone
- ✓ Uses unambiguous language in documentation and language/telephone handover
- ✓ Can identify adequate media for the information that needs to be handed over
- ✓ Is aware of the opportunities and challenges when using media during handover
- ✓ Is aware of the importance of clear handwriting
- ✓ Is aware of the importance of speed/rate of speech

Key messages for students

- Written documentation
- Telephone handover
- Impact of medium on communication
- Paraverbal aspects of communication
- Information transfer
- Mobile devices

Handover via Telephone

When handing over patients' information via telephone information can only be given by verbal communication. Information normally drawn from mimics and gestures don't exist. When being on the telephone it is more likely to do something else simultaneously or at least heading somewhere. Also one cannot see if the other one is reading some documentation, just speaking to somebody else covering the microphone, writing on a computer or something else interfering with the handover quality. On the one hand a handover via telephone should be well prepared and structured like face-to-face handovers, using a handover tool (see p.64ff). On the other hand, when receiving a handover via telephone it is even more important to choose an undisturbed place, check back the things heard and write down notes.

The Royal Adelaide Hospital has implemented an "ISBAR Telephone Handover Form" for patient transitions (114). The WA Health Clinical Handover Policy values telephone-only-handover as "adequate" only concerning escalation of deteriorating patient, patient transfers for a test or appointment and patient transfers to another ward (115).

Students' activity 2.7

Small group exercise

Objectives:

Experience challenges of handover via telephone.

Train closed-loop communication.

Instructions:

In small groups of 3-4 students, 2 students are instructed to sit back to back to simulate not seeing each other during a telephone call, the other(s) shall observe and take notes if necessary. One student then "calls" the other to request blood test or x-ray results (prepared cue cards) and uses closed-loop communication techniques to ensure the right understanding. The observing students give feedback.

Written Documentation

Besides a standardised verbal handover it is important to be able to rely on a complete written documentation. Depending on the hospitals principles and software, the time and structure of documentation might be predetermined.

The Physician Documentation Expert Panel, as part of the Ontario government's Information Management Strategy, provided a *Guide to Better Physician Documentation* in 2006 (116):

Find the full *Guide to Better Physician Documentation* on:

http://www.health.gov.on.ca/transformation/providers/information/pdf/guide_bpd.pdf

The Association of Clinical Documentation Improvement Specialists (acdis) provides *Tip Cards* and presentations on different fields of documention for members(117).

Find another example of a General Documentation Tip Card (by the Department of Veterans Affairs, Aleda E. Lutz VAMC Clinical Documentation Improvement Program) on:

http://www.hcpro.com/content/280688.pdf

Mobile Devices

The CLAS app

The CLAS app (by Bridget Maher) is a mobile application providing the Cork Letter Writing Assessment Scale (118) in an easy-to-use format. It is available in 4 different languages for iPhone and iPad (https://itunes.apple.com/de/app/clas-app/id536324094?mt=8). For more information please go to chapter 3.6 – Cork Letter Writing Assessment Scale (CLAS) (p. 122).

The Electronic Discharge Letter (eDL) mobile app

The eDL app is being developed to encourage further standardization of discharge letters by replacing the traditional handwritten or printed letter by an electronic version exchanged between mobile devices. A completely seamless exchanged is of the eDL is technically supported by Near Field Communication (NFC) standards. The app is still being evaluated and is not yet available.

For more information about the eDL app, visit:

http://www.medicine20congress.com/ocs/index.php/med/med2013/paper/view/1717

https://www.youtube.com/watch?v=bAT0JKPPZu4

ISBAR

As mentioned above an ISBAR app is also available for iPhone and iPad via the iTunes app store (https://itunes.apple.com/au/app/isbar/id465890292?mt=8).

Student activity 2.8

Blended learning activity

Instructions:

- Download the CLAS app on your smartphone or tablet and explore its structure and functions.
- Assess one of the discharge letters you have written on ward using the CLAS app and go over it again to gain a higher rate.
  OR: Write a discharge letter from a fictional or real patient case following the steps of the CLAS app.

2.5 – Administration of Clinical Content

Introduction

Besides a framework for content, structure and different tools in handover, students need to learn to apply clinical knowledge about patients to handover situations. This reflects one of the requirements for the young doctors when they begin their careers and will challenge them every day. The following chapter focuses on the application of their clinical knowledge to handover situation throughout a working day to enable students to perform handover with a professional background and in effective manners. Main Topics are information collection and transfer, prioritization, clinical decision making, recipients, and evaluation.

Learning Outcomes

- ✓ Knows the key points that should be transferred through handover
- ✓ Knows about medical criteria which are important to prioritize in a handover
- ✓ Knows where to find patient relevant information (computer, etc.)
- ✓ Knows tools to systematically document/collect information about patients
- ✓ Is able to gather information about a patient over a period of time and is able to recall it quickly when necessary
- ✓ Knows steps of efficient decision making
- ✓ Applies rules/steps of efficient decision making
- ✓ Is able to differentiate important from less important information in the handover process
- ✓ Prioritizes information in the correct way
- ✓ Communicates knowledge when relevant
- ✓ Is motivated to provide the best care possible
- ✓ Is aware about the need for time management and prioritization of medical information
- ✓ Is willing to research open questions and filter clinically relevant information

Key messages for students

- Key elements of Clinical Content to be handover
- Systematic documentation
- Relevant patient information
- Recipient design
- Decision making
- Prioritization of information and patient tasks

Clinical Decision Making

The Encyclopædia Britannica defines clinical decision making as "the process of formulating a diagnosis" (119). There are scientific approaches to optimize clinical decision making, e.g. outlined in the book by Sox, Higgins and Owens (120).

On the following Website by the NHS (121) there is a good overview on clinical decision making (What is clinical decision making?, The Core Skills of Clinical Decision Making, Factors that affect decision making, The Decision Making Process, Shared Decision Making) and recommended student tasks:

http://www.effectivepractitioner.nes.scot.nhs.uk/practitioners/clinical-decision-making.aspx

Dr. Graham R. Nimmo gives an introductional talk on Clinical Decision Making (122), one can listen to online:

http://elearning.scot.nhs.uk:8080/intralibrary/IntraLibrary?command=open-preview&learning_object_key=i164n3095109t

Student activity 2.9

Clinical Exercise (e.g. on a ward or ICU)

Objectives:

Students should process a patient's history and identify its priority problem. They become aware of factors that lead to their estimation and discuss what keypoints would be necessary to transfer in a handover of their Patient.

Instructions:

Gather all available records and information on patient XY and use all available media. (Written file notes, digital documentation. Lab results, radiology reports, any other diagnostic report or note)

Discuss the patient's main clinical problem and identify factors that lead you to your hypothesis and confirm it with your supervisor.

Identify information that needs to be transferred in a handover

Preparation:

Supervisor needs to find a ward in the hospital where students could research a patient's history. Further access to digital documentation and room or place for ***discussion is needed.***

Module 3 – Simulation

Simulation

- Simulation in Medical Education
- Educational Principles for Simulation in Medical Education
- Overview of Handover Simulation Session
- Learning Outcomes for Handover Simulation Session
- Clinical Scenarios for Handover Simulation
- Cork Letter Writing Assessment Scale

3.1 – Simulation in Medical Education

What is simulation?

There are many definitions of simulation; two such definitions that encompass simulation have been defined by Gaba and McGaghie respectively as;

> "A technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion. "Immersive" conveys the sense that participants have of being immersed in a task or setting as they would if it were the real world" (123).

> ''In broad, simple terms a simulation is a person, device, or set of conditions which attempts to present (education and) evaluation problems authentically. The student or trainee is required to respond to the problems as he or she would under natural circumstances. Frequently the trainee receives performance feedback as if he or she were in the real situation" (124).

Why use simulation?

Simulation produces an environment in which learners can successfully master the skills relevant to clinical practice without undue risk to the learner, other staff members or to the patient. It also permits errors of either diagnosis or management to be allowed to develop and followed through to their natural conclusion. It has many advantages these include decreased risk to patients, insurance that the learning outcomes are addressed, it enables deliberate practice, and it allows immersion in learning tasks. It enables tasks to be structured in staged learning chunks, and provides a controlled environment in which it is safe to learn from errors (125).

Simulation is a way of skill development, transfer, and maintenance that can support the learner on the path from novice to expert, from the classroom to the workplace in a safe and controlled manner. It is not a mere focus on procedural skill or performance rather it has a much more expansive perspective incorporating the affective and cognitive domains. Continuous practice involving medical simulations is linked with better-quality learner outcomes and this relates to diverse levels of learners from a broad spectrum of clinical specialties. It appears to deliver a dose–response relationship in terms of accomplishing desired learning outcomes (126). Simulation has a broad spectrum of fidelity and the level can vary from high to low. Types of fidelity include psychological fidelity, which is the degree to which a real task is captured in the environment, and the degree of reality perceived by the student. Environmental fidelity reflects on the degree to which the simulation duplicates sensory cues. Equipment fidelity reflects the degree to which the simulator reflects reality (127). Simulation gives the learner the opportunity to experience a learning environment that is immersive and experiential.

Typology of simulation tools in medical education

Meller developed the classification scheme for medical simulation, which has four essential components. These involve the patient and the disease process, the procedure test or equipment, the learner, and the expert practitioner (128). It can be argued that the key influential parameters to the learning process are the setting, the atmosphere and the trainee's participation in simulation. Alinier has proposed a typology of simulated methodologies based on the use of simulation tools and techniques with six different technological levels from level 0 to level 5 (129). These are respectively written simulations, three-dimensional models, screen based simulators, standardised patients, intermediate fidelity patient simulators, and interactive patient simulators. An advantage of this typology is that it can be linked to Miller's pyramid for the assessment of clinical skills, competence and performance thus allowing an accurate description of the simulation technology and its place in the learning process (130). Written simulations, which have a technological level of 0 and equate to level I of Miller's pyramid (knows / knowledge). Technological levels 1 and 2 (three-dimensional models, screen based simulators) equate to level II of Miller's pyramid (knows how / competence). Technological levels 1, 3, and 4 (three-dimensional models, standardised patients, intermediate fidelity patient simulators,) equate to level III of Miller's pyramid (shows how/ performance). Technological levels 3, 4, and 5 (standardised patients, intermediate fidelity patient simulators, and interactive patient simulators) equate to level IV of Miller's pyramid (does / action). Further advantages of this typology is that it will allow valid comparisons of educational tools in relation to their potential effectiveness and verisimilitude at different stages of medical training including the effect of simulation and transfer of skills and maintenance of skills in real-life practice.

Fidelity in simulation

Simulation is often classified as having high or low fidelity. Frequently this description is applied to the level of technological sophistication, however high or low fidelity is much more than high technology. Fidelity in simulation is the extent to which the appearance or the behaviour of either the simulator or the simulation reflects accurately the appearance and behaviour of the real situation. Simulation has a broad spectrum of fidelity and this fidelity can range from high to low. The level of fidelity is partially dependent on the context of the simulation, the learning outcomes and on the experience of the learner. Types of fidelity include psychological fidelity, which is the degree to which a real task is captured in the environment, and the degree of reality perceived by the student. Environmental fidelity reflects on the degree to which the simulation duplicates sensory cues. Equipment fidelity reflects the degree to which the simulator reflects reality (127).

Limitations to simulation –

Simulation can never be a replacement for authentic experiential learning is a real-world clinical practice. It can however prepare practitioners for the real world providing a framework for deliberate practice that may then be transferred into the workplace. Neither is simulation an educational tool to replace other forms of learning but rather is an adjunct to these forms of learning. There is certainly a question over the transferability of learning from the simulated

environment to the workplace. Simulation should not be seen to take the place of exposure within the clinical environment. Rather it should be seen as a prequel to this where skills can be developed with little risk to the learner or to the patient. It may also be viewed as a learning process that may run in parallel with exposure to the working clinical environment to develop skills and maintain competencies. It is also unrealistic to expect that simulation alone is sufficient to produce competency. Learners will need to apply their skills in the real world, under supervision and to receive feedback in order that their skills can be developed and adapted.

There are potential risks of unintended behaviours if the learner does not realise the difference between the workplace at the simulated environment. Within the simulated environment their performances and behaviours can cause no harm to patients however within the work environment they will need to recognise their own limitations and to seek advice of senior colleagues' especially in difficult situations. Equally the workplace can be a source of contradictory practice that may cause dissonance for the learner and therefore they need to be prepared for this. The establishment of simulated-based learning is expensive. The costs not only relate to the technological aspects of the physical infrastructure but also there is also a requirement for significant faculty input and of course there will be on going costs associated with this type of education program.

3.2 – Educational Principles For Simulation in Medical Education

Figure 12: Students and faculty review simulation case as part of formative assessment.

The main purpose of medical education at the undergraduate level should be to produce graduates who are fit for purpose at the point of graduation with respect to medical practice. Therefore new graduates should possess the core competencies in terms of knowledge, skills and attitudes required of them to perform their duties at the their expected level of competency. As with any teaching and learning in medical education, one of the fundamental challenges is to ensure that the learning undertaken is transferable to the workplace. It is helpful to view medical students as adult learners when designing educational content that is applicable to the clinical environment. It is desirable to focus particularly on the learner, the learning process and the context of the learning process respectively. To begin with the students must have a readiness to acquire the appropriate knowledge, and it is important that this knowledge is applicable to their perception of existing relevant problems. Factors in the non-cognitive domain such as the pacing of learning, the meaningfulness of the learning, and the motivation for learning must be incorporated within the learning process. Finally the context of the learning must be skills specific for a given situation and these skills must pertain to solving relevant and authentic problems. Several theories of teaching and learning support the design and delivery of the simulated clinical experience. These can be used to both delineate the educational basis for simulation and also to inform appropriate research questions for simulation.

Adult learners

Knowles first introduced the term "andragogy" defining it as "the art and science of helping adults learn" (131). He described a set of four assumptions with in this theory to which he later

added a fifth (132). These assumptions concern a transition to self-directed learning, the influence of life experience on enhancing learning, that the readiness of an adult to learn is closely related to the demands that are placed on them in their everyday life, that adults become more problem centred than subject centred in their learning, and finally that adults are more motivated to learning based on internal factors rather than external factors. There are several implications for educational practice that can be derived from these set of assumptions for the young adult at University that are quite different from those required for them in second level education. These differences have been described in three areas namely the learning context, the learner and learning process (133). Based on these concepts the following then are pertinent to the teaching and learning process for the undergraduate medical student. To begin with the students must have a readiness to acquire the appropriate knowledge, be internally motivated to learn and it is important that this knowledge is applicable to their perception of existing relevant problems. Factors in the non-cognitive domain such as the pacing of learning, the meaningfulness of the learning, and the motivation for learning must be incorporated within the learning process. Finally the context of the learning must be skills specific for a given situation and these skills must pertain to solving relevant and authentic problems. Simulation encompasses all of these processes.

Social Cognitive Theory

Social cognitive theory encompasses two approaches the behaviourist approach, which emphasises the influence of our actions on learning, and the cognitive approach, which emphasises the importance of cognition influencing learning and function (134). These two approaches together form a basic tenant of social cognitive theory, which proposes that our actions, our learning, and our functioning are the result of a dynamic and reciprocal interaction within three essential determinants. These are personal, environmental and behavioural determinants. The relevant influences produced both these three factors will vary for different events depending on circumstances, activities and the particular individual.

Figure 13: Students and faculty participating in simulation.

Within this theoretical framework humans are described as possessing five basic abilities that essentially underpin learning and functioning. Symbolising capability enables people confronted with a problem to test possible solutions symbolically rather than going through the process of trying out possible alternative solutions through the process of systemic elimination. Forethought capability anticipates the potential outcomes of our actions and plans strategies to maximise the possibility of the outcome being the desired one. Vicarious capability reflects on what can be facilitated through observation of other people's actions and consequences. This applies especially were behaviours can be primarily conveyed effectively by modelling on others behaviours. Self-regulatory capability reflects on how behaviour is regulated essentially by our own internal standards and our evaluative reactions to our own actions. Discrepancies between our actions or our performance and the expected standard can activate a self-evaluation, which will influence our subsequent behaviour and performance. Self-reflective capability is the process by which we analyse our experiences and think about our thought processes the so-called process of metacognition. Through the process of self-reflection we may gain understanding, of ourselves our behaviour and indeed the world around us.

Within simulation there are implications from this theory for effective teaching and learning. Modelling or demonstration of the desired skill will facilitate vicarious learning through the process of observation. This will not only shorten the learning process it is of course essential when new skills are being acquired. Demonstration can help students visualise the standard performance against which to measure their personal performance and progress. Having clear learning outcomes will also enhance learning. It develops the capability of forethought for monitoring and directing the individual's progress. Students must have the relevant task related knowledge otherwise their perceptions of their performance would be low which may impact on future performance. Guided practice of a new skill with feedback about a learner's performance is essential to develop positive perceptions about the task and to experience success rather than failure especially within the early part of the learning process. Corrective feedback is an integral part of effective learning and without feedback performance cannot be improved efficiently or effectively to the desired level of attainment. Finally students require opportunities to reflect on their learning to determine whether new approaches are necessary to achieve their learning outcome and to allow integration of the learning experience into existing experiences and knowledge. Reflection can enable the learner to build accurate perceptions of their own performance based on their experience. During the use of simulation in teaching and learning, feedback is used extensively as such to bring about new behaviours. Simulation also provides for "over learning" as a means of making specific behaviours automatic. An example of this behaviourist approach is found within for example resuscitation training, where the "skills and drills" method is used repeatedly to achieve competency in resuscitation training at both undergraduate and postgraduate level (135). Simulation can facilitate the learner by identifying discrepancies between the expectation and the experience of the simulated event. This will enable the learner to improve and add to their previous knowledge. Using simulation in medical education provides both realism relevant to the

learner's experience and also allows learners to critically reflect on how they felt and how they performed during the simulated exercise. This can be done through group discussion and individual reflection. Again in this situation simulation provides a safe opportunity for the learner to experience healthcare with out any risk to the patient.

Reflective Practice

The notion of reflection and the reflective practitioner are fundamental tenants to the epistemology of professional practice. Donald Schön argues that the formal theoretical knowledge, such as that acquired in the course of professional training, is often not useful in the solution of the daily problems of real-life practice encountered in professional practice. Central to his assertion is the need for a professional scholarship and the recognition of the epistemology of professional practice (136).

The reflective practitioner by linking theory to practice incorporates and relates professional knowledge to practical competence and professional activity. Professionals develop mastery around areas of competence. They practice within these areas as if on automatic pilot. Schön has described this as a professional "knowing in action". The practice of one's profession has been compared to the skill of riding a bicycle (137). Occasionally the unexpected happens in that the bicycle skids. Similarly when the unexpected happens in professional practice two types of reflection may be triggered. These are "reflection in action" and "reflection on action". Reflection in action involves three sets of activities. The first involves looking at the problem from a different perspective and reworking it. The second is exploring where the problem fits within already existing knowledge and expertise. Finally there is the understanding of the elements and implications present in the problem, its solution and consequences. Reflection on action occurs later and is the practice of thinking back on what has happened in the unexpected event to determine what may have contributed to this unexpected event, and the implications of this for future practice. Both may be considered as iterative processes where insights and learning from one experience may be incorporated into future practice.

Boud et al likewise describe an iterative approach that has three principal phases. The first begins with the experience (138). The second phase involves reflection on the experience, and dealing with both negative and positive feelings about it and re-evaluating it. The third phase of the process has been labelled as "outcomes" in which new perspectives of the event can lead to a change in behaviour in relation to future events. They also stress the importance of recognising the emotional aspects of experience that go together with effective learning from experience. Moon views reflection as the mechanism that transfers surface learning to deep learning (139). Deeper learning can then be incorporated within previous experience and knowledge resulting in a powerful resource that the individual can draw on in practice. Reflection is not without its drawbacks. It is often considered as an individual action. There is the possibility of reflecting on one's performance may be inadequate or inaccurate. This may lead to what has been described as "single loop learning" which may lead to confrontation of current behaviours as opposed to questioning them and identifying areas for improvement of learning (140). In view of this it is suggested that reflection be seen as a collective activity,

where individuals can share insights, and reflection is thereby potentially increasing their collective and individual learning. Reflective practitioners may therefore assess a given situation from the perspectives of both the theoretical and practical basis. Reflection in practice is a learned skill relating to critical thinking and situations analysis.

Slotnick linked Schön's work to how doctors learning in practice. In this he emphasises the importance of thinking when solving problems (reflection in action), and thinking after problem solving (reflection on action) (141). It may be argued that these two processes are necessarily for clinicians to gain new insights around practice-based problems, problem solving and clinical practice itself. Transferring this concept to undergraduate medical education would suggest that on-going learning, development of competence and improved practice may result. Crandal discusses the value of using Schön's model in all levels of medical education, and outlines how this occurs during all effective learning in clinical education (142). Within simulation reflection in action occurs during an event, little time is available and reflection in action may be limited, but prior experiences and knowledge are drawn upon and used within the context of the unfolding situation, which may add to the experiences already in place. Reflection on action is more indirect and in a sense formalised and maybe used at an individual level, or a collective level for example when audio and video recordings may be used to analyse an event and its outcomes.

Transformative Learning

Transformative learning involves the reconfiguration of ideas knowledge and meanings simulated by the process of critical reflection. It is viewed as a social process of constructing and internalising a new or revised interpretation of the meaning of one's experience as a guide to action (143). A central tenant of transformative learning is the empowerment of the learner (144). This allows the learner to participate fully and freely in a critical assessment of their performance. Reflection is again a central concept in transformative learning theory. Mezirow distinguishes three types of reflection content reflection, process reflection and premise reflection. These processes describe respectively an examination of the content or description of the problem, and examination of the problem-solving strategies used and questioning the problem itself. Cranton suggests guidelines for the use of transformative education (145). Many of them can be incorporated into simulation. These include processes around discourse which include having rational discourse, equal participation of learner and teacher, having structured procedures for discourse, ensuring faculty have good group facilitation skills, encouraging critical self-reflection, give due consideration to individual differences among learners and finally by using a variety of teaching and learning strategies. The use of video recordings in simulation for example can again results in a restructuring of previous learning and the development of new learning goals. Likewise video recordings can enable reflection both in and on action and through facilitated dialogue can result in transformative learning with the development of new learning goals or outcomes.

Experiential Learning

Kolb's experiential learning theory is based on models of learning within the domains of cognitive psychology, educational psychology and social psychology (146). He has described for learning environments affectively orientated (feeling), symbolically oriented (thinking), perceptually orientated (watching), and behaviourally oriented (doing). Experiential learning methods provide bridges connecting the learners existing level of understanding and experiences with a new set of understanding and experience. Experiential learning provides for the transfer of learning from a classroom environment to one where there is an emphasis on the practical application of the learning within for example the working environment. Kolb's framework of learning environments can inform the design and development of the learning environment within simulation. This theory suggests that learning, knowledge and activity are intrinsically interlinked. Within the simulated environment the learner will experience the process of being affectively orientated, symbolically orientated, perceptually orientated and behaviourally oriented. By engaging learners in a clinical exercise using simulation it gives both the realism pertinent to the learners experience and the time for them to evaluate and understand different potential scenarios and their outcomes. The experiential learning process using simulation methodologies allows learners to critically reflect on how they have felt during the exercise. They can then begin to create concepts and hypotheses relating to the experience through dialogue with others and personal reflection.

Cognitive apprenticeship

The concept of the cognitive apprenticeship describes the process of how tasks are identified and made visible to the learner (147). Abstract tasks are situated in the context of authentic settings and situations are varied in order to emphasise commonalities. Transfer of learning is promoted through a process of modelling, coaching, scaffolding, articulation, reflection and transferability. The cognitive apprenticeship approach may be used for example in the teaching of a practical skill prior to its application and transfer to the clinical environment and for teaching and learning within the simulated environment

Activity Theory

Activity theory is based on the work of a group of Soviet psychologists this theory proposes conscious learning comes from activity (148). Activity refers to patterns of behaviour that are both conscious and socially formed. Human activity is motivated by needs and objectives. This theoretical framework suggests that learning, knowledge and activity are intertwined in a multifarious way and the learning is essentially a socially determined activity. Human activities are driven by certain needs where people wish to achieve a certain purpose. This activity is usually mediated by one or more instruments or tools. This approach might inform for example the interprofessional training of health care staff within the simulation setting. This will enable teams to rehearse the skills within high fidelity simulation and then transfer these skills into clinical practice (149).

Understanding by Design

Although not primarily aimed at medical education, the educational model proposed by Wiggins and McTighe 'understanding by design' advocates that teachers formulate learning objectives from their students' required behaviour, which, in our case, is that of the competent junior hospital doctor (150). Therefore in designing curricular content for simulation, course content, learning experiences and instruction develop as intermediate steps linking students' current knowledge to their post-qualification competence as ward-based doctors.

It is important when considering all of the above educational theories to recognise that the level of expertise within the participant in the simulation will have an impact on any simulated exercise. Expertise might be considered as an endpoint in a stepwise development of cognitive, psychomotor, communication and affective skills. Five levels of development have been identified in the process; these are novice, advanced, competent, proficient and expert respectively (151). It is essential that the simulation should be modelled in accordance with the levels of expertise expected of the learner.

Feedback in simulation

Feedback is an essential component within simulation it is the way to close the learning loop. Within the clinical setting there are many tasks that are suitable to the process of feedback. They essentially have to have one factor in common that is the task must be observable. In medical education within the clinical context the recipient of feedback is the learner and the provider of the feedback is usually a staff member who has responsibility for clinical teaching. Essentially to provide feedback one must be able to envision a standard performance against which to compare the learner's performance. The difference between the learner's performance and the standard performance will essentially determine the content of the feedback. Feedback is common in medical education however there is a widespread discrepancy between medical students' perception and clinical teachers' perception of the feedback (152). Medical students are reported to be the least satisfied of university students with the feedback they received in all aspects of their undergraduate training (153). In order for feedback to be effective it must consist of the following components, the purpose of feedback should be agreed by both recipient and the provider, the feedback must be in acceptable formats to the recipient and finally the content of the feedback must be useful to recipient. The dominant model to date for providing feedback is that described by Pendleton that is essentially designed to increase acceptability of the feedback process by engaging the learner in this process (154). This model stresses the importance of identifying strengths and then focusing on ways in which performance can be improved. The model described by Kurtz et al is a modification of the Pendleton model but lays heavy emphasis on the importance of identifying and agreeing the recipients learning objectives before feedback is given (155). Both of these models are limited by the fact that they both provide a framework for feedback, which is generic, and provides little information on the specific content of the feedback.

There are many requirements for feedback to be effective. It is essential that the learner is clear about the learning outcomes expected. Feedback may also raise the learner self-awareness, and reinforce good practice and be corrective by encouraging modifications of

behaviour and is analogous to the reflective thinking process that is required for safe clinical practice. In order for feedback to be effective it should be well timed and is close to the simulation session as possible. It should be based on direct observation of the learner and it should be phrased in non-judgemental language. It should be specific and constructive, it should be given appropriate time and be delivered in an appropriate setting. Ineffective feedback will occur if there is lack of planning, if it is too generalised, if comments are personalised or if the learner is defensive. In the simulated environment four stages may be identified in the feedback process. The first is preparation for feedback and this should be addressed prior to the simulation exercises. The second is related to the fact that the learner must take on the role of a practitioner within simulation and it is important that they are allowed time to come out of role before commencing feedback. Thirdly feedback needs to be constructive and finally feedback needs to encourage the learner to reflect on his or her experience. Van de Ridder et al. have provided a specific and useful definition for feedback in terms of clinical education.

They have defined it thus:

> *"Specific information about the comparison between a trainee's observed performance and a standard, given with the intent to improve the trainee's performance"* (152).

This definition is helpful when considering the process of feedback in simulation. However McKinley et al provide a definition that focuses on performance, which of course is a key element of simulation and therefore may be more useful. They suggest that feedback on performance should focus on the following five questions. What was performed well? What could be performed differently? What step(s) was or were missed out? What is the priority for improvement? What must the learner do to make this improvement? (156).

Transferability

Simulation may only be judged effective if the learning takes place within the simulated environment is transferred to the workplace. In view of the above discussion it may be surmised that the following features will enhance this transferability. It is important to place learning context, likewise simulation should be staged in a progressive manner that is in line with the expected expertise level of the learner. The role of the tutor in a learning episode involving simulation is crucial in ensuring appropriate feedback and enabling the learner to reflect on the learning content. It is equally important that the simulated environment allows the learner to suspend disbelief. This will depend to a significant degree on the fidelity of the simulated environment including physical, psychological, haptic and environmental fidelity. It is also important that the skill sets that the learner is developing are relevant and related to particular skills that will be required for practice in a reasonable timeframe. In a recent systematic review Issenberg et al identified that even though much of the primary literature in relation to simulation was weak, they reported that there were certain aspects of high fidelity simulation which was consistently linked to better learning (157). They identified these as follows, the need for integration of simulation within the curriculum and allowing time for

repetitive practice within a range of clinical scenarios. The need for defined learning outcomes, the need to provide a safe educationally supported environment, and the need to provide appropriate feedback. Finally it is important to ensure simulator validity and fidelity in order to create a realistic and believable range of complex clinical situations.

3.3 – Overview of Handover Simulation Session

Key messages for students

- Simulation provides a safe setting for students to develop and practice their skills.
- Within a simulated environment, students can practice giving and receiving face-to-face, telephone and written handovers.
- This setting has the potential to support the learner at each step on the path from novice to expert.

The Handover simulation session is designed to take place in a simulated ward of the School of Medicine at University College Cork. However the simulations and the simulated environment can be adapted to meet local needs. The following description is of the simulated environment The Simulated ward is a high fidelity 6-bedded simulated ward (Figure 1 & 2).
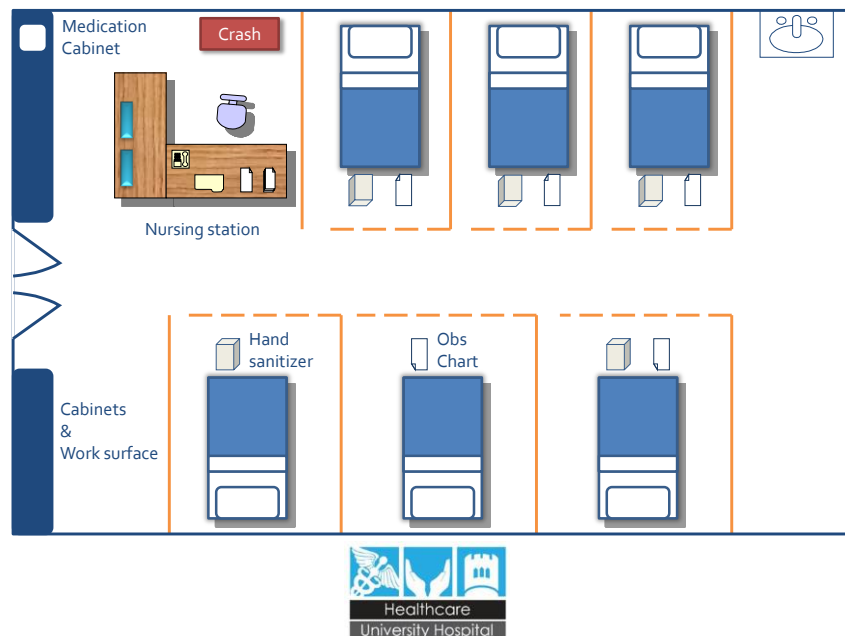

Figure 14: Layout of the simulated ward of the School of Medicine at UCC.

Figure 15: The simulated ward of the School of Medicine at University College Cork.

Role players are trained to perform in the role of simulated patients and used to simulate the patients in the simulated ward (Figure 16).

Figure 16: Student interacting with a simulated patient on the simulated ward of the School of Medicine at University College Cork

The students are informed in advance of the simulation with respect to the purpose of the simulation, the location of the simulation, the date and the time of the simulations. The students are asked to prepare in advance for the Handover simulation by familiarising themselves with the recommended background reading in Handover and the Learning Outcomes for the Handover Simulation. They are informed that they will play the role of newly

qualified doctors in the simulation. A qualified nurse who plays the role of the ward sister in the simulated ward supports the students (Figure 17).

Figure 17: Nurse interacting with student on the simulated ward
of the School of Medicine at University College Cork

On the morning of simulation training for handover students are met by a member of faculty and briefed on the learning outcomes, objectives and structure of the teaching and learning session. They are informed that the assessment of their performance is formative and that they will receive at the end of the simulation session generic feedback in relation to the scenarios from faculty as a group, and that they will receive a confidential written copy of a metric based assessment of their performance in the scenarios (Figure 18). The students also receive formative confidential written metric based feedback from the simulated patients on their communication skills In UCC the simulated ward is fitted with audio-visual equipment. This remotely streams video and audio to the desktop computers of faculty observing and assessing the student's performance in the simulation. Students are informed of this before they commence simulation training. The handover scenarios, clinical notes and metrics used for formative assessment are available in the following sections of this document.

Figure 18: Students receiving formative feedback from faculty and simulated patients at the end of a simulated session on the simulated ward of the School of Medicine at UCC.

3.4 – Learning Outcomes For Handover Simulation Session

Learning Outcomes

International developments in education have moved from the traditional model of a "teacher centred" approach to a "student centred" approach to teaching and learning. This alternative model focuses on what the students are expected to be able to do at the end of the module or programme. Thus, this approach is commonly referred to as an outcome-based approach. Statements called intended learning outcomes, commonly shortened to learning outcomes, are used to express what it is expected that students should be able to do at the end of the learning period.

Definition of Learning Outcomes

Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of a process of learning.

Learning Outcomes

- ✓ Recall the adverse effects on patients of transition of care
- ✓ Recognise patients at risk during transitions of care
- ✓ Identify what patient information should be included at handover
- ✓ Communicate clearly with patients and families, and members of the health care team during hospital discharge
- ✓ Write a coherent, comprehensive and succinct discharge letter form hospital care to primary care
- ✓ Communicate the essential elements of a patient handover face to face with another doctor
- ✓ Communicate the essential elements of a patient handover via telephone with another doctor
- ✓ Manage discharge medications to ensure safety and patient adherence
- ✓ Perform a competent handover

3.5 – Clinical Scenarios for Handover Simulation

Scenario 1

Scenario 1: information for Faculty, Clinical Notes, Metrics for Assessment

The patient is a 30-year-old type 1 diabetic who has a urinary tract infection that requires treatment with an antibiotic. She has a past history of urinary tract infections, high cholesterol and an anaphylactic reaction to penicillin aged 10 years that required treatment with adrenaline. Her medications are her insulin regime and a statin for high cholesterol.

In this scenario the student in the simulated role of a newly qualified doctor is to handover a patient to a student also in the simulated role of a newly qualified doctor.

The student giving the handover is asked to review the patient Anne O'Leary. Specifically the student is to review the clinical notes and take a focused history from the patient in order to identify the pertinent clinical problems and tasks to be done in order to handover competently to the second student. As well as giving the clinical background the student is required to indicate the tasks required of the student receiving the handover.

These Tasks are:

1. Task to be done Get Results of MSU
2. Task to be done Treat UTI with appropriate antibiotic
3. Task to be done chart pain relief if required by the patient
4. Task to be done Chart other Patient Medications

The accompanying case notes for the scenario and metric based checklist for assessment of the student may be used or adapted as required to meet local needs. Faculty can use the checklist to give generic feedback to students on the essence and important aspects of the scenario in terms of handover. The student copy can be used to give confidential formative feedback to the student at the end of simulation.

Scenario 1: Casenotes

Name	Anne O'Leary	Dob 01/10/1984	Hospital No 23479311

Date		Clinical Notes

Today -1   Anne O'Leary   30 yr old ♀

P/C   Poorly controlled blood glucose & Urinary symptoms suggestive of UTI

B/G: Type I Diabetes diagnosed age 17.

HPC: 5/7 history of dysuria & frequency & haematuria

& poorly controlled blood sugars:

Varying between   3.0 – 26.0mmol/l

(Two episodes of symptomatic hypoglycaemia)

History of recurrent UTI's

This infection more persistent than previous ones and associated with bilateral loin pain

No history of kidney stones

Blood sugars are always difficult to control but especially during infection

No nausea /vomiting - able to hold down food

Diabetic History:

Very early signs of peripheral retinopathy but no maculopathy

No foot problems – good bilateral sensation

High Cholesterol

Date	Clinical Notes
	Meds
	Insulatard/Actrapid regime
	Pravastatin 10 mg o.d nocté
✳	*Penicillin allergy:* *Urticarial rash and tongue swelling, stridor responded to single does of IM Adrenaline when aged 10 years old.*
	FHx: *strong family history of Type I diabetes*
	SHx: married with three children
	Non-smoker, occasional alcohol intake few glasses of red wine at the weekend
	Good compliance with diabetic diet
	Works as a secretary in a solicitor's office
	Ros: *CNS:* *No headache* *RS:* *No cough*
	No loss of vision *No sputum*
	No weakness *No haemoptysis*
	No Parasthesia *No chest pain*
	in feet
	No CVS symptoms.

Patient

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Name   *Anne O'Leary*   Dob 01/10/1984   Hospital No *23479311*

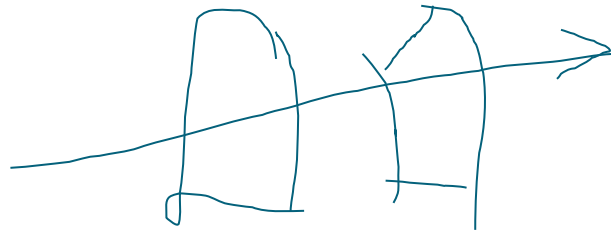Date   Clinical Notes

O/E   Pleasant woman in no distress

P: 82/ min   BP:116/76mmHg

RR: 16/mm   Temp: 38.4° C

Resp:

Abd:

No loin tenderness in the renal angle

Slight suprapubic discomfort on palpation

Bowel sounds – present

CNS: cranial nerves I – XII intact.

PNS: Some evidence of peripheral neuropathy: vibration sensation at MTP joints in feet

Otherwise:
T

P

C   RUL,   LUL,   RLL,   L LL   All normal

S

R

Urinalysis   2 + blood   2+ nitrates   3+ leukocytes.

Assessment: Poorly controlled blood glucose & UTI

Date	Clinical Notes

Plan: *Admit for blood glucose monitoring and for antibiotics*

Usual bloods

Intern   *Clinical Review including Pain and hydration management*

              Prescribe oral antibiotic after chasing up on MSU report

              Chart Routine Medication

                         Pat Barry   *#118*

                           Medical Reg

Metrics for Assessment of Scenario 1: Faculty Copy

Scenario 1 Patient Anne O'Leary: Doctor Giving Handover to Another Doctor

Student ID   Faculty   Date

Competence	Yes	No	Comment
Self introduction included *name*	Yes	No	
Self introduction included *doctor*	Yes	No	
Self introduction included *role*	Yes	No	
Positive patient ID Name	Yes	No	
Positive patient ID Date of Birth	Yes	No	
Positive patient ID MRN	Yes	No	
Date Patient Admitted to Hospital	Yes	No	
Reason for Admission UTI	Yes	No	
Mental State Alert and orientated	Yes	No	
Relevant Past Medical History UTI	Yes	No	
Relevant Past Medical History Type 1 Diabetic	Yes	No	
Relevant Past Medical History Anaphylactic Reaction	Yes	No	
Relevant Past Medical History High Cholesterol	Yes	No	
Allergic Reaction Causative Agent	Yes	No	
Allergic Reaction Clinical Description	Yes	No	
Allergic Reaction When it Occurred	Yes	No	
Allergic Reaction Treatment with Adrenaline IM	Yes	No	
Investigation MSU	Yes	No	
Task to be done: Get Results of MSU	Yes	No	
Task to be done: Treat UTI with antibiotic	Yes	No	
Task to be done: Chart pain relief if required	Yes	No	
Task to be done: Chart other Medications	Yes	No	
Clinical Summary	Yes	No	
Ask doctor receiving handover "any questions"	Yes	No	

Summary of student performance for feedback:

Metrics for Assessment of Scenario 1: Student Copy

Scenario 1 Patient Anne O'Leary: Doctor Giving Handover to Another Doctor

Student ID   Faculty   Date

Competence	Yes	No	Comment
Self introduction included *name*	Yes	No	
Self introduction included *doctor*	Yes	No	
Self introduction included *role*	Yes	No	
Positive patient ID Name	Yes	No	
Positive patient ID Date of Birth	Yes	No	
Positive patient ID MRN	Yes	No	
Date Patient Admitted to Hospital	Yes	No	
Reason for Admission UTI	Yes	No	
Mental State Alert and orientated	Yes	No	
Relevant Past Medical History UTI	Yes	No	
Relevant Past Medical History Type 1 Diabetic	Yes	No	
Relevant Past Medical History Anaphylactic Reaction	Yes	No	
Relevant Past Medical History High Cholesterol	Yes	No	
Allergic Reaction Causative Agent	Yes	No	
Allergic Reaction Clinical Description	Yes	No	
Allergic Reaction When it Occurred	Yes	No	
Allergic Reaction Treatment with Adrenaline IM	Yes	No	
Investigation MSU	Yes	No	
Task to be done Get Results of MSU	Yes	No	
Task to be done Treat UTI with antibiotic	Yes	No	
Task to be done chart pain relief if required	Yes	No	
Task to be done Chart other Medications	Yes	No	
Clinical Summary	Yes	No	
Ask doctor receiving handover "any questions"	Yes	No	

Summary of student performance for feedback:

Figure 19: Student taking history from a patient role player in simulation.

Scenario 2

Scenario 2: information for Faculty, Clinical Notes, Metrics for Assessment

The patient is 53 year old who has presented with acute left sided lower abdominal pain and a change in bowel habit. He had 1 previous similar episode, which resolved without treatment. He has been referred in by his family doctor for investigation. The differential diagnosis is acute diverticulitis or inflammatory bowel disease. The patient's vital signs show signs of clinical deterioration.

In this scenario the student is in the role of a newly qualified doctor. The nurse in charge of the ward asks the student (simulated doctor) to reassess the patient as he is complaining of increased pain. The vital signs have been checked and recorded on a chart at the end of the bed. They indicate that the patient is deteriorating, which should prompt the student to telephone a more senior doctor.

The tasks required of the student are:

1.	Take a targeted history and examination
2.	Review the vital signs on the chart
3.	Prescribe an appropriate analgesic for the patient.
4.	Consider the patient's other needs (fluids, other investigations)
5.	Call for senior help and give a telephone handover to a senior doctor

The accompanying case notes for the scenario and metric based checklist for assessment may be used or adapted as required to meet local needs. Faculty can use the checklist to give generic feedback to students on the essence and important aspects of the scenario in terms of handover. The student copy can be used to give confidential formative feedback to the student at the end of simulation.

Figure 20: Medical student performing handover to nurse in simulation.

Name	Liam Barry		
Dob	27.5.1961	Hospital No	3946871
Date		Clinical Notes	

Today -1

P.C.	L/F pain
Hx PC	Began 3/7 ago
	Becoming progressively worse
	Went to see GP when the pain began to cause him trouble walking
	Pain increased by moving around
	Relieved by staying still
	Assoc c̄ slight change in bowel habit
	Now passing 3 – 4 loose stools per day
	(usually1 -2 stools per day)
	No blood PR
	No melena
	No vomiting
	1 similar episode 6/12 ago
	Resolved with antibiotics and analgesia
Pm/SHx	Appendix removed aged 11
	Mild asthma
Meds	Salbutamol inhaler PRN (Rarely uses anymore)
	NKDA
SHx	Married
	No children
	Works as a librarian in Cork county Library
	NON smoker
	C_2H_5OH – upto10 units per week

Date	Clinical Notes
FHx	Mother – Irritable Bowel otherwise well
	Father – Hypertension, otherwise well
ROS	CVS ⎤
	RS ⎦ NAD
	CNS/ PNS – occasional headaches
O/E	T = 37.2° C
	P = 92
	BP = 110/66
	R = 12
	GIT

Pr - haemorrhoids

Otherwise ⎪ NAD

FOB negative

	RS ⎤
	CVS ⎬ NAD
	CNS/PNS ⎦
Imp-	? Diverticulitis, ?? Inflammatory Bowel Disease
Plan	Admit.
	Nil PO overnight,

Name   Liam Barry

Dob   27.5.1961   Hospital No 3946871

Date   Clinical Notes

Plan   Continued:- FBC, U&E, LFT, Amylase, ESR,CPR

            IV fluids   1 litre normal Saline 8 hourly

            For Ultrasound of abdomen mané.

            Discuss with team re need for CT abdomen.

            IV antibiotics

            Metronidazole 500mg TDS IV

            Co-amoxiclav 1.2 g TDS IV

            IV analgesia as required

            Tramadol 50mg po 6 hourly prn

            Review mané.

            Helen Phelan   IMC # 763889

                    Bleep 480

                Surgical SHO on call.

Patient

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Metrics for Assessment of Scenario 2: Faculty Copy

Scenario 2 Patient Liam Barry: Doctor Giving Handover over telephone to Senior Doctor

Student ID   Faculty   Date

Competence	Yes	No	Comment
Self introduction included *name*	Yes	No	
Self introduction included *doctor*	Yes	No	
Self introduction included *role*	Yes	No	
Positive patient ID Name	Yes	No	
Positive patient ID Date of Birth	Yes	No	
Positive patient ID MRN	Yes	No	
Situation:	Yes	No	
Explains presenting complaint	Yes	No	
Describes examination findings	Yes	No	
Describes Vital signs	Yes	No	
Background:	Yes	No	
Describes relevant past history	Yes	No	
Assessment:	Yes	No	
Details problems, which need intervention:	Yes	No	
Analgesia- describes problem	Yes	No	
Analgesia- suggests possible management options	Yes	No	
Fluid management- describes need	Yes	No	
Fluid management- suggests possible management	Yes	No	
Suggests further tests which may be indicated	Yes	No	
Outlines queries or uncertainties that the student may have	Yes	No	
Recommendations:	Yes	No	
Student makes clear to the senior doctor what level of help he needs now to manage the patient.	Yes	No	

Patient

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Metrics for Assessment of Scenario 2: Student Copy

Scenario 2 Patient Liam Barry: Doctor Giving Handover over telephone to Senior Doctor

Student ID   Faculty   Date

Competence	Yes	No	Comment
Self introduction included *name*	Yes	No	
Self introduction included *doctor*	Yes	No	
Self introduction included *role*	Yes	No	
Positive patient ID Name	Yes	No	
Positive patient ID Date of Birth	Yes	No	
Positive patient ID MRN	Yes	No	
Situation:	Yes	No	
Explains presenting complaint	Yes	No	
Describes examination findings	Yes	No	
Describes Vital signs	Yes	No	
Background:	Yes	No	
Describes relevant past history	Yes	No	
Assessment:	Yes	No	
Details problems, which need intervention:	Yes	No	
Analgesia- describes problem	Yes	No	
Analgesia- suggests possible management options	Yes	No	
Fluid management- describes need	Yes	No	
Fluid management- suggests possible management	Yes	No	
Suggests further tests which may be indicated	Yes	No	
Outlines queries or uncertainties that the student may have	Yes	No	
Recommendations:	Yes	No	
Student makes clear to the senior doctor what level of help he needs now to manage the patient.	Yes	No	

Scenario 3

Scenario 3: information for Faculty, Clinical Notes, Metrics for Assessment

The patient is a 29-year-old woman who has a first trimester miscarriage that requires treatment with an Evacuation of the Residual Products of Conception under general anaesthetic.

In this scenario the student in the simulated role of a newly qualified doctor is to write a discharge letter to the patient's general practitioner.

The student writing the discharge letter is asked to review the patient Michelle Cotter. Specifically the student is to review the clinical notes and write the discharge letter.

The accompanying case notes for the scenario and metric based checklist for assessment of the student may be used or adapted as required to meet local needs. Faculty can use the checklist to give generic feedback to students on the essence and important aspects of the scenario in terms of handover. The student copy can be used to give confidential formative feedback to the student at the end of simulation.

Scenario 3: Casenotes

Name	Michelle Cotter		Dob 19/05/1985

Hospital No 821973599 Consultant Mr R Jones

Date   Clinical Notes

Day 1 P.C. - GP Referral

20.10 P.V. bleeding X 36 hours

Hx P.C. GP

12/ 40 gestation Regular 28day cycle

P.V. bleeding began 36hours ago as light spotting

Followed by suprapubic pain, radiating to anterior thighs

Began to pass clots PV approx 6 hrs ago.
Bleeding is lighter now, but still passing brown discharge P. V.

No other symptoms of note

PM/SHx - Appendectomy aged 11

    Otherwise nil.

Meds - Folic acid, on COCP until 8months ago.

    NKDA

SHx - - Clerical Officer with Health Service Executive

    Married

     Non smoker

     Usually drinks 5-6 Units C_2H_5OH per week,

     But not drinking alcohol since trying to conceive.

      Planned pregnancy.

FHx - Mother Hypertension, otherwise well

     Father - A& W

     2 Sisters - No medical problems+

Date	Clinical Notes
	ROS - CVS - ° Chest pain
	° Dyspnoea
	°palpitations
	RS - ° cough
	°Sputum
	°wheeze
	GIT - Nauseated for the past 2 months -
	Mainly in the mornings.
	Occasional morning vomiting.
	Less nauseated over the past 4/7
	Lower abdominal cramping.
	Mild diarrhoea today.
	° Weakness
	° Numbness
	GUT ° Frequency
	° dysuria
	°haemanituria
	Skin NAD
	ENT
	O/E - Obs - P = 72
	BP – 110/68
	RR = 8
	Temp = 36.8 °C
	Abd :-
	Abdomen soft
	Mild suprapubic tenderness
	Old appendix Scar °Rigidity
	°guarding

Patient

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Name	*Michelle Cotter*	Dob *19/05/1985*

Hospital No 821973599   Consultant Mr R Jones

Date   Clinical Notes

CVS   -HS   I   II^{+ve}
RS   -

Clear toP/A

CNS -   II   X II
PNS -

	RUL	LUL	RLL	LLL
T	N	N	N	N
P	V	V	V	V
C	N	N	N	N
R	N	N	N	N
S		Intact		

Skin : - NAD

P.V. :-   Bulky uterus, consistent with early pregnancy
Cervix posterior, closed, non tender
Blood on glove

Mental state :   - Tearful;, anxious,   Good family support

Imp:-   PV bleeding in early pregnancy -

Possible Dx - Threatened spontaneous abortion

- Incomplete spontaneous abortion

- ?? complete spontaneous abortion

Plan   IV access

          FBC

        U&E

        Group & antibodies & hold

β   HCG

        Urinalysis

HelenHynes

Dr H. HYNES   obstetric on call Reg, bleep 261

Name   Michelle Cotter

Dob 19/05/1985   Hospital No 821973599

DAY -1   ultrasound of Uterus -

21.15   Gestation sac seen , approx 7 weeks size

      No Foetal Heart seen

Impression: - incomplete spontaneous abortion

         Currently stable

Plan - Keep fasting overnight.

    i⃗ as above

    For P.V. scan mané to confirm diagnosis

If confirmed for ERPC tomorrow.

(Evacuation of the Residual Products of Conception)

HelenHynes Dr H. HYNES obstetric on call Reg   Dr

  Dr Helen Hynes Bleep 261

Date	Clinical Notes

DAY -2   P.V Scan

10.30   Products seen in uterus

No foetal heart seen

For ERPC tomorrow AM.

Can eat today, fast from midnight tonight

HelenHynes

Dr H. HYNES   obstetric on call Reg

Bleep 261

DAY -3   Theatre

08:00   ERPC performed

Stable through out procedure

Products evacuated from uterus no evidence of infection

HelenHynes

Dr H. HYNES   obstetric on call Reg

Bleep 261

DAY -4   Mr Jones Ward Round

11.25   Uneventful post operation recovery

No PV discharge or bleeding

Apyrexial

Plan Discharge today

Letter to GP

Information   hand-out Miscarriage Association of Ireland

Review Mr Jones Private Rooms in 6 weeks

Rob Gaffney Dr R Gaffney

SHO Obstetric Bleep 313

Metrics for Assessment of Scenario 3 Faculty Copy

Scenario 3 Michelle Cotter: Discharge Letter Writing

Student ID   Faculty   Date

Competence	Yes	No	Comment
Name of Patient	Yes	No	
Date of Birth	Yes	No	
Medical Records Number	Yes	No	
Ward	Yes	No	
Consultant	Yes	No	
Specialty	Yes	No	
Date of Admission	Yes	No	
Date of Discharge	Yes	No	
Problem List at start of letter	Yes	No	
History Reason for Admission	Yes	No	
History Presenting complaint	Yes	No	
History Past medical History	Yes	No	
Physical Examination Pertinent clinical findings	Yes	No	
Investigations	Yes	No	
Diagnosis	Yes	No	
Current Status	Yes	No	
Management Plan	Yes	No	
Medication List discharge medication	Yes	No	
Follow up	Yes	No	
Sign off Title	Yes	No	
Sign off Name	Yes	No	
Sign off Position	Yes	No	
Sign off Bleep number	Yes	No	
Sign off Telephone Number	Yes	No	

Metrics for Assessment of Scenario 3 Faculty Copy

Scenario 3 Michelle Cotter: Discharge Letter Writing

Student ID   Faculty   Date

Competence	Yes	No	Comment
Name of Patient	Yes	No	
Date of Birth	Yes	No	
Medical Records Number	Yes	No	
Ward	Yes	No	
Consultant	Yes	No	
Specialty	Yes	No	
Date of Admission	Yes	No	
Date of Discharge	Yes	No	
Problem List at start of letter	Yes	No	
History Reason for Admission	Yes	No	
History Presenting complaint	Yes	No	
History Past medical History	Yes	No	
Physical Examination Pertinent clinical findings	Yes	No	
Investigations	Yes	No	
Diagnosis	Yes	No	
Current Status	Yes	No	
Management Plan	Yes	No	
Medication List discharge medication	Yes	No	
Follow up	Yes	No	
Sign off Title	Yes	No	
Sign off Name	Yes	No	
Sign off Position	Yes	No	
Sign off Bleep number	Yes	No	
Sign off Telephone Number	Yes	No	

Figure 21: Student, faculty and simulated patient.

3.6 – Cork Letter Writing Assessment Scale (CLAS)
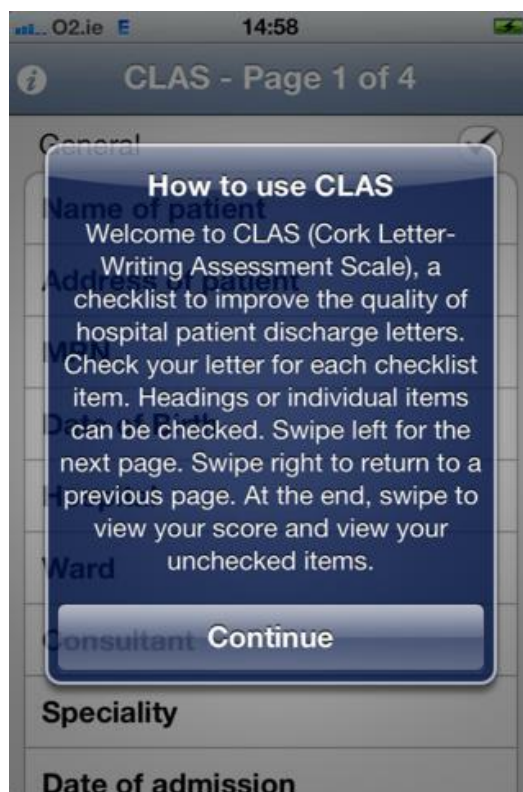
Figure 22: CLAS App Designed By Dr Bridget Maher

The CLAS Mobile Application – Teaching Students how to Write Hospital Discharge Letters

The Hospital Discharge Letter

All patients who access hospital services need a discharge letter, from brief day-case admissions to patients with prolonged in-patient stays. The importance of writing clear and accurate hospital discharge letters is becoming more apparent as changes occur in how hospital healthcare is provided. The European Working Time Initiative means that junior doctors are required to do more shift-work and may be required to write discharge letters about patients they are not familiar with. In addition, economic pressures mean that a patient's hospital stay is now as short as possible, increasing patient vulnerability at time of discharge and also increasing the number of handovers back to primary or community care.

The hospital discharge letter is probably the most important of all written communications between hospital and family doctor. Family doctors rely on the hospital discharge letter to learn about the patient's 'story' as an in-patient (158–161) and to acquire the necessary information required to take over patient care.

A lack of accurate and up-to-date information can lead to the unnecessary duplication of tests and even more importantly, can lead to medication errors and inadequate patient monitoring with subsequent serious adverse effects (162,163). It can also lead to a higher risk of hospital readmission (164).

Information included in handover letters

Discharge letters vary considerably in length, content, structure and overall quality. Standard information contained in discharge letters usually includes the following (Table 6)

Table 6: Information commonly included in discharge letters.

• Demographic data such as name, address, medical record number, date of birth etc.
• Date of admission and date of discharge.
• Reasons for admission (presenting complaint) - letters vary in the amount of detail.
• Main diagnosis – not all letters contain an itemized list of diagnoses.
• Investigations done - not all letters include the results of these investigations.
• Medications on discharge - few letters highlight drugs that have been stopped or started in hospital.
• Follow-up - letters vary regarding specific details, e.g. instructions on which care-giver is to make the appointment.
• Name of doctor writing the letter - signature is often illegible and contact details are frequently omitted (bleep number or phone number).

However, a number of items are frequently omitted. These include (Table 7):

Table 7: Information commonly missing from discharge letters.

• Documentation of physical findings.
• Information about the patient's course in hospital (treatment, procedures).
• Test results that are still pending at time of hospital discharge.
• Information given to patients or their families (i.e. a terminal illness prognosis).
• Patient's clinical status at time of discharge.
• Itemized problem list.
• Management plan.

Quality of Hospital Discharge Letters - Cause for Concern

Traditionally, discharge letters have been paper-based using narratives and free text descriptions of diagnoses and diseases. Often a handwritten summary is given to the patient on the day of discharge and a typed full report follows at a later date. This frequently results in family doctors attempting to decipher illegible handwriting from carbon copies or indeed the letter itself (165). Most discharge letters are written by junior doctors and writing discharge letters can take time away from a junior doctor's other clinical duties. Importantly, discharge letters are frequently not received by the family doctor for days or even weeks after the patient has been discharged from hospital. Studies show that the quality of hospital discharge letters is very variable (166). Datasets are not standardized and vary between different hospitals, leading to considerable differences in content and quality of discharge letters. Discharge letters frequently omit, or fail to emphasize, important information. The letter format may lack structure, clarity, and 'readability'. Legibility is a big concern in hand-written letters. Often the family doctor receives the discharge letter at night-time or on weekends, times when the full hospital team is not on duty and clarification of confusing content may not be possible. Moore, Wisnivesky, Williams & McGinn (167) found that handover errors occurred in around 50% of patients at discharge and were associated with a significantly higher risk of readmission. Were et al. (168) found that only 16% of discharge letters contained information on tests with pending results.

Of importance is the fact that medical students lack standardized training in handover including instruction on how to write a hospital discharge letter (169). Skills such as this are often perceived to be acquired 'on the job' or are presumed to be taught elsewhere on the medical curriculum. Moreover, there is a lack of educational tools and resources to help doctors learn to write discharge letters.

Development of the Cork Letter-Writing Assessment Scale (CLAS)

The use of standardized formats has been shown to improve the quality of procedures within healthcare including hospital discharge letters (170–174). Van Walraven et al. (174) found that a standardized discharge letter format with clear subheadings was better than narrative summaries (shorter and easier to access the most relevant information). Rao et al., (172) evaluated a standardized dictation template accompanied by educational sessions.

Results showed that the overall quality score, allocated by three assessors, was 21% higher in the intervention group. Interestingly, the length of the summaries decreased by 67% after introduction of the template. Similarly Braun et al. (170), assessed a discharge letter template for oncology patients. Using the template improved communication with respect to the relevance, timeliness, format, and amount of information. Ferran et al. (171), found that standardized discharge letter proformas improved patient handover in trauma patents.

In an attempt to address the lack of educational tools in this area, the School of Medicine at University College Cork (UCC) developed an itemized checklist (Cork Letter-Writing Assessment

Scale or CLAS) to help medical students and doctors improve the quality of hospital discharge letters and to standardize information transfer at handover (Table 8).

Checklists are increasingly used in medical education and patient safety protocols. The recently published WHO Patient Safety Curriculum Guide advocates the use of checklists in medical training (105). 'Checklists, protocols and care plans designed for particular categories of patients are effective ways of communicating patient-care orders.'

The development of a standardized dataset for discharge letters as a checklist would therefore appear to be an important step towards improving patient safety at handover. The CLAS checklist was developed after analysis of several datasets developed in other jurisdictions and after an extensive literature review. Family doctors and medical education professionals were also consulted regarding discharge letter content and structure. The checklist includes all items that are deemed important in a discharge summary. While most datasets were similar, there were some differences (Table 8). The CLAS checklist can be used as a reference when writing discharge letters or can be used as an assessment tool to evaluate the quality of hospital discharge letters. CLAS is suitable for all discharge locations (home, step-down care, nursing home or other institutions).

The next step after the dataset had been agreed upon was to develop the checklist as a mobile application in the form of a digital checklist with a scoring system. The aim was to support medical professionals and students in handover communications in the clinical environment.

Table 8: Itemized CLAS checklist (Cork Letter-Writing Assessment Scale) with comments.

Heading	Items included	Comments
General	Name, address Date of birth MRN Hospital Ward Consultant Speciality Date admission GP's name	A specific rating exists for identifying the name of the GP i.e. 'Dear Dr Casey' rather than 'Dear Dr'. *MRN =Medical Record Number
Problem List	Is there a problem list?	Include problem list at beginning.
History	Reason for admission (presenting complaint). History presenting complaint (relevant history including current meds). Past history	
Physical Findings	Pertinent clinical findings (clinical findings relevant to case)	

Investigations	Investigations done Results of abnormal investigation Test results pending	It is important to mention test results that weren't available at time of discharge
Diagnosis	List of diagnoses Highlighting of new diagnosis	List of diagnose and highlighting of new diagnosis.
Current Status	Current status documented?	Is the patient well and ambulant or does he need help?
Management Plan	Management plan listed?	Planned investigations/treatment?
Medication	List discharge medication? (score 4) Dose written correctly? (2) Any medication stopped and why? (score 2) New medication commenced and why? (score 2)	Medication mistakes are a major source of medical error and has been given higher scoring. All medications should be listed clearly and in formal units. Special mention should be made of medication that has been discontinued and why. New drugs commenced should be highlighted including duration of use.
Follow-up	Follow-up (Outpatient appointments)? Details of other appointments and who has to make the appointment. Need for blood tests (family doctor or hospital)?	Often a patient may have multiple follow-up appointments. Details should be given and it should be made clear who has to make the appointment (hospital or family doctor). If a patient needs regular blood tests, details of how often these need to be done and where (family doctor or hospital) should be clarified.
Communication	Information shared What was explained and to whom?	It is important that the GP knows what has been said to the patient (or patient's family)-especially in the case of terminally ill patients.
Sign-off	Name, Title, Bleep no/phone no.	
Clarity/Writing style	Unnecessary information (letter too long?) Structure-did the letter flow logically? Will reader understand abbreviations? Is the writing legible? Good use of headings? Readability-good syntax/grammar/spelling. Clarity (easy to read and understand)	The CLAS scale has a 7-point checklist to help improve overall writing style, structure, clarity and 'readability'.

Development of CLAS as a mobile application

The CLAS mobile application is based directly on the 50-item CLAS checklist (Table 3) and contains the same headings and items (Figure 6). Ticking the heading signifies completion of that particular group of items; ticking an individual item signifies completion of that particular item. At the end, items not 'ticked' appear as a list of 'unchecked items', prompting the user to write a 'corrected' discharge letter.

CLAS also generates a total score, the objective being to promote the quest for the 'perfect score' of 50. No patient data are entered at any point, thus there are no ethical or medico-legal issues regarding the storage of personal or clinical data.

All items score one point except items of particular importance in handover and patient safety (medications and management plan).

1. Management plan (two points).

2. List of discharge medications (four points).

3. Drug doses written in formal units and clearly written (two points).

4. Names of any medication stopped and why (2 points).

5. Names of any new medication commenced and why (2 points).

An important advantage of the integration of a scoring system into the CLAS application is that CLAS can be used to grade the quality of discharge letters. In addition, the scoring system allows quantification of improvement in letter-writing following instruction and use of CLAS. By using CLAS frequently, and by being prompted that certain items have been omitted, students and doctors can increase their recall of important items, thus improving the quality of hospital discharge letters at handover. In addition, by increasing overall awareness of the importance of discharge letter content and quality, doctors and medical students may pay more attention to this important area of handover.

In addition to letters to family doctors, the CLAS mobile application can also be used to improve the quality of other referral letters (i.e. letters to other consultants, letters to physiotherapy etc.) and can provide a template for good written communication between care-givers. The CLAS display screen was designed to be simple, intuitive, and user-friendly and was informed by the pilot test results of user experience.
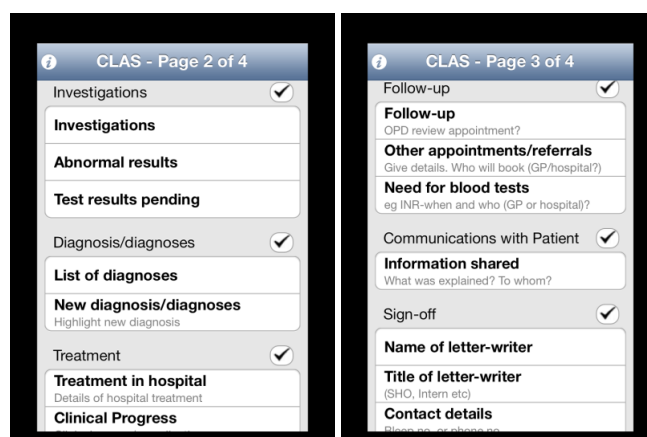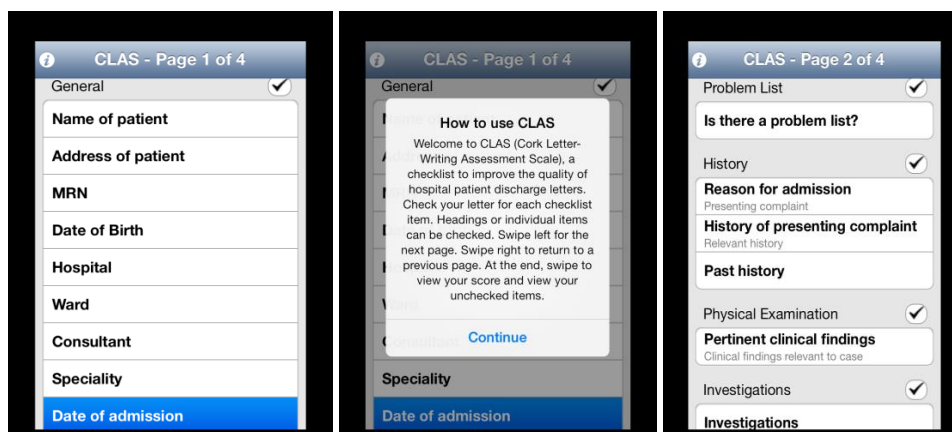
Figure 23: Pages 1 to 4 of the CLAS App

Use of the CLAS checklist by medical students in the 4th year of their studies increased the inclusion of the majority of items considered important in different discharge letter datasets. Items that showed no difference in score between the intervention group and controls related to obvious information such as the patient's name. Overall accuracy of the letter was greater in the students who had received CLAS instruction and individual item and section scores were also higher. Letter structure, use of headings, and clarity were also better in the CLAS intervention group compared with controls. Thus, use of the CLAS checklist improved the quality of discharge letters written by medical students (118).

List of figures

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