

Human Factors & Patient Safety

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Objectives

- ▶ After completing this lecture you should:
 - ▶ Define and describe the Human Factors and its relation to patient safety
 - ▶ Recognize the importance of applying human factors in healthcare
 - ▶ Summarize the impact of Human Factors on people's health and patient safety
 - ▶ Differentiate between the different types of Medical Errors
 - ▶ Describe several specific Actions to reduce medical errors as related to Humans Factors

Introduction

- ▶ Delivering healthcare can place individuals, teams and organizations under pressure
- ▶ In such intense situations, decision making can be compromised, impacting on the quality of care, clinical outcomes, and potentially causing harm to the patient; poor performance also increases costs



What are Human Factors

- ▶ Human factors refer to **environmental, organizational and job factors**, and **human and individual characteristics** which influence behavior at work in a way which can affect health and safety.

What are Human Factors

- ▶ Human factors can be defined as anything that affects an individual's performance.

What are Human Factors

A simple way to view human factors is to think about three aspects:

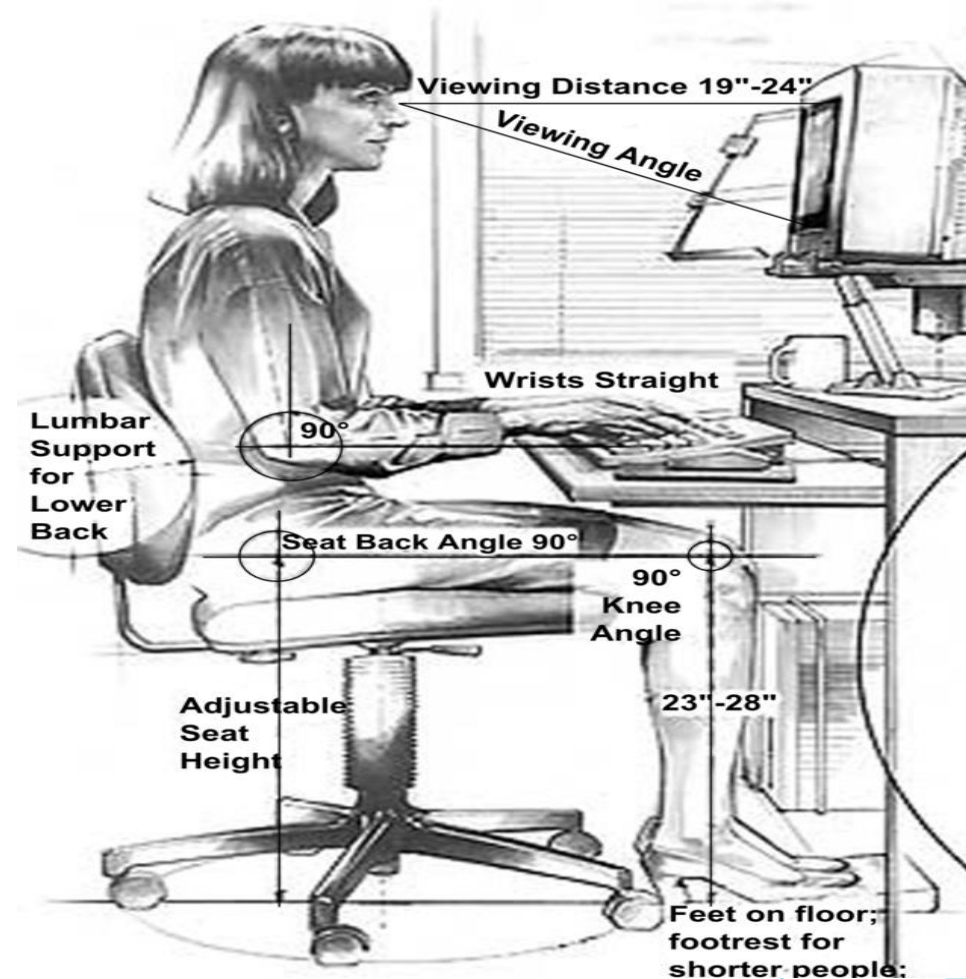
- ▶ **The job**
- ▶ **The individual**
- ▶ **The organization/environmental**

and how they impact on people's health and safety-related behaviour.' (HSE, 1999 p2).

Human Factors-The Job

Including :

- ▶ Nature of the task
 - ▶ Workload
 - ▶ Working environment
- ❖ This includes matching the job to the physical and the mental strengths and limitations of people.



Human Factors-**The Individual**

Including:

- ▶ Competency
 - ▶ Skills (changeable)
 - ▶ Personality, attitude(fixed)
 - ▶ Risk perception
 - ▶ Sleep deprivation
-
- ❖ Individual characteristics influence behavior in complex ways.



Human Factors-The Organization

Including:

- ▶ Work patterns
- ▶ The culture of the workplace, resources
Communications
- ▶ Leadership and so on.



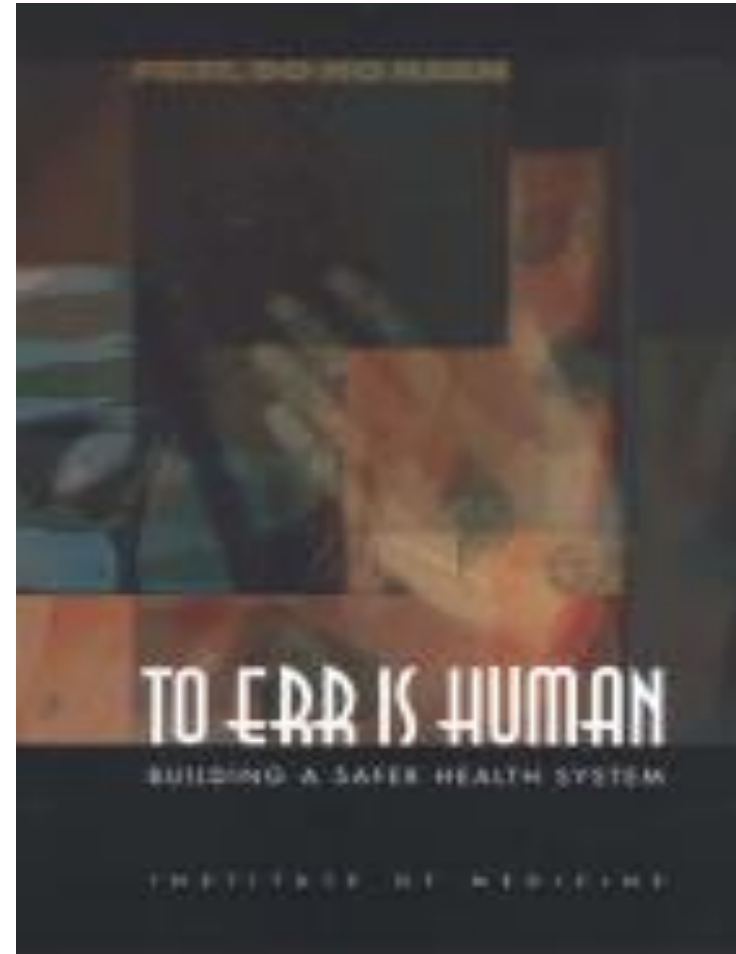
The Benefits of Applying Human Factors in Healthcare

Awareness of human factors can help you to:

- ▶ To prevent **Medical Errors**.
- ▶ Understand why healthcare staff make errors.
- ▶ Identify ‘systems factors’ threaten patient safety.
- ▶ To prevent occupational accidents and ill health.

TO ERR IS HUMAN

- ▶ Institute of Medicine (IOM) in 1999 called for a national effort to make health care safer.
- ▶ United States at least 44,000 people, and perhaps as many as 98,000 people die for preventable medical errors .
- ▶ Cost of medical errors claims : between \$17 billion and \$29 billion per year in hospitals nationwide.
- ▶ More commonly, errors are caused by faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them.



Medical errors

Failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim, such as :

- ▶ Retained surgical instruments
- ▶ Restraint -related injuries

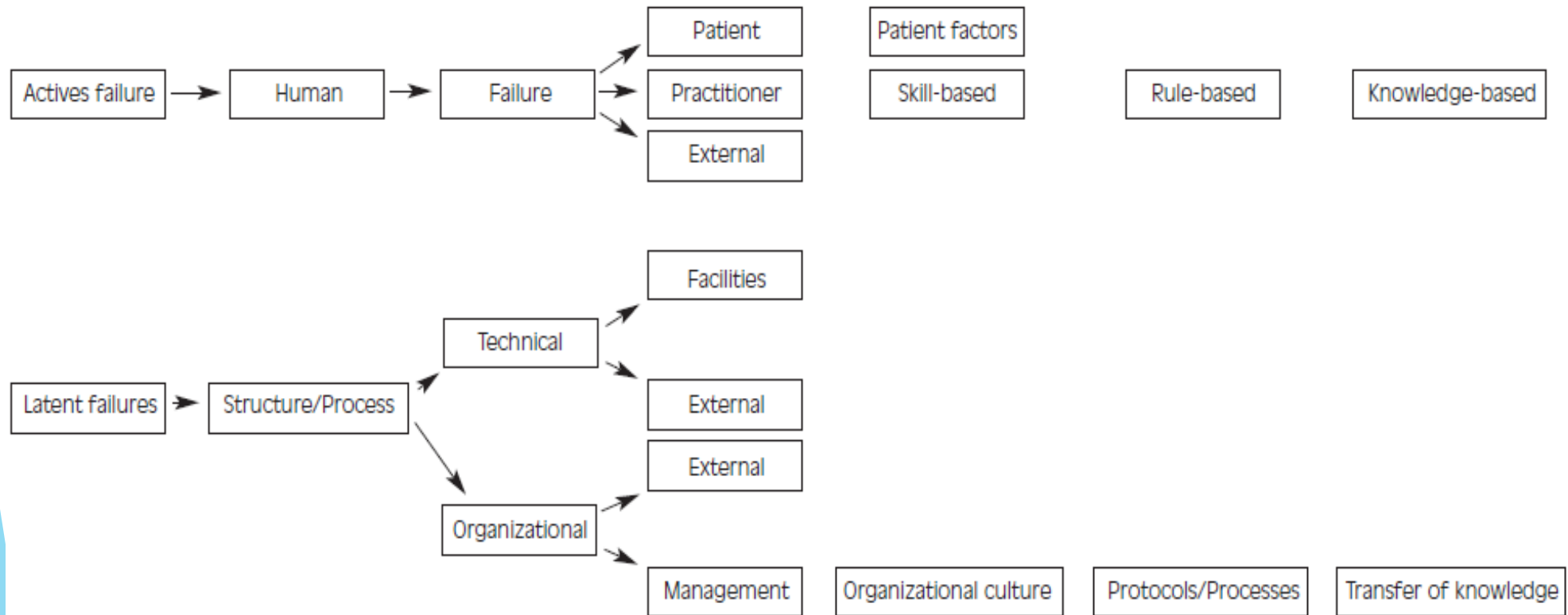


King Saud University Medical City (KSUMC) -Medical Errors

- ▶ Expired medication dispensed
- ▶ Un planned hysterectomy
- ▶ Wrong Sponge counting
- ▶ Self extubation
- ▶ Wrong patient ID , went to wrong procedure
- ▶ Wrong medication delivered
- ▶ Wrong dose administered

Sources of Error

Table I. Classification of causes (JCAHO - Joint Commission on Accreditation of Healthcare Organizations).



Types of Medical Errors

▶ Diagnostic

- ▶ Error or delay in diagnosis (in the case of the diabetic patient may lead to blindness or glaucoma)
- ▶ Use of outmoded tests or therapy

▶ Treatment

- ▶ Error in the performance of an operation, procedure, or test (inserting a breathing tube into a patient's esophagus).
- ▶ Error in the dose or method of using a drug

▶ Preventive

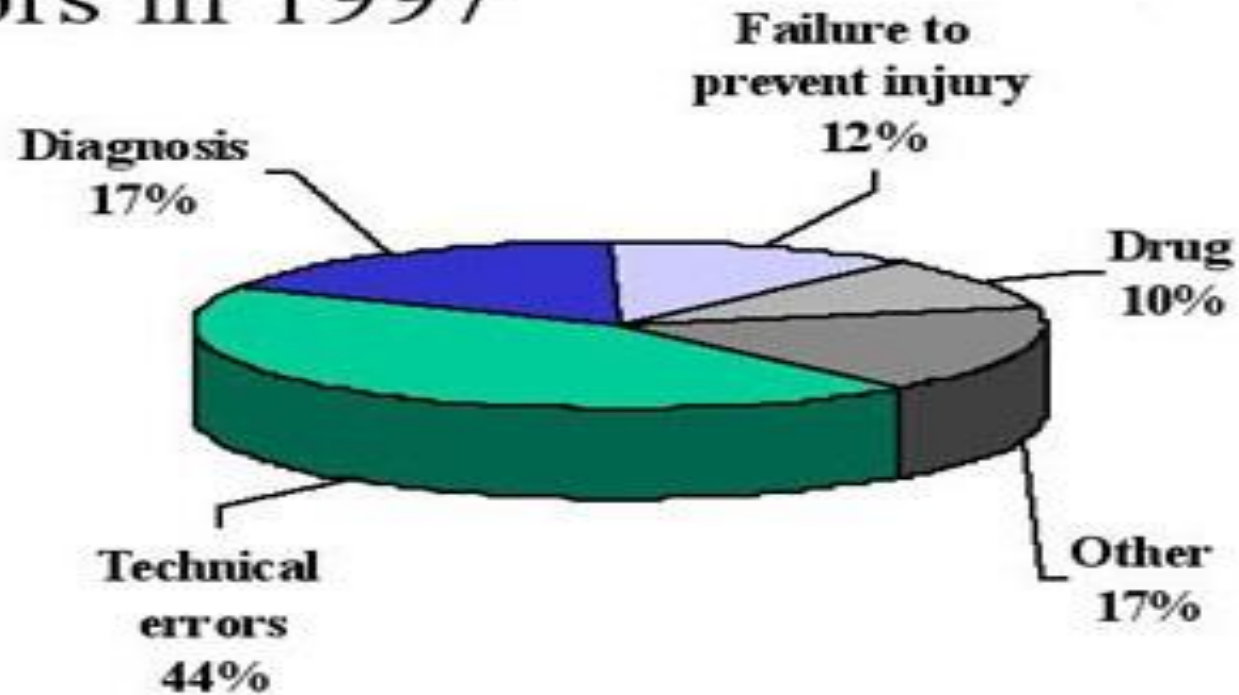
- ▶ Failure to provide prophylactic treatment
- ▶ Inadequate monitoring or follow-up of treatment (no order for anticoagulant post major orthopedic procedure may lead to PE).

▶ Other

- ▶ Failure of communication
- ▶ Equipment failure

Types of Medical Errors

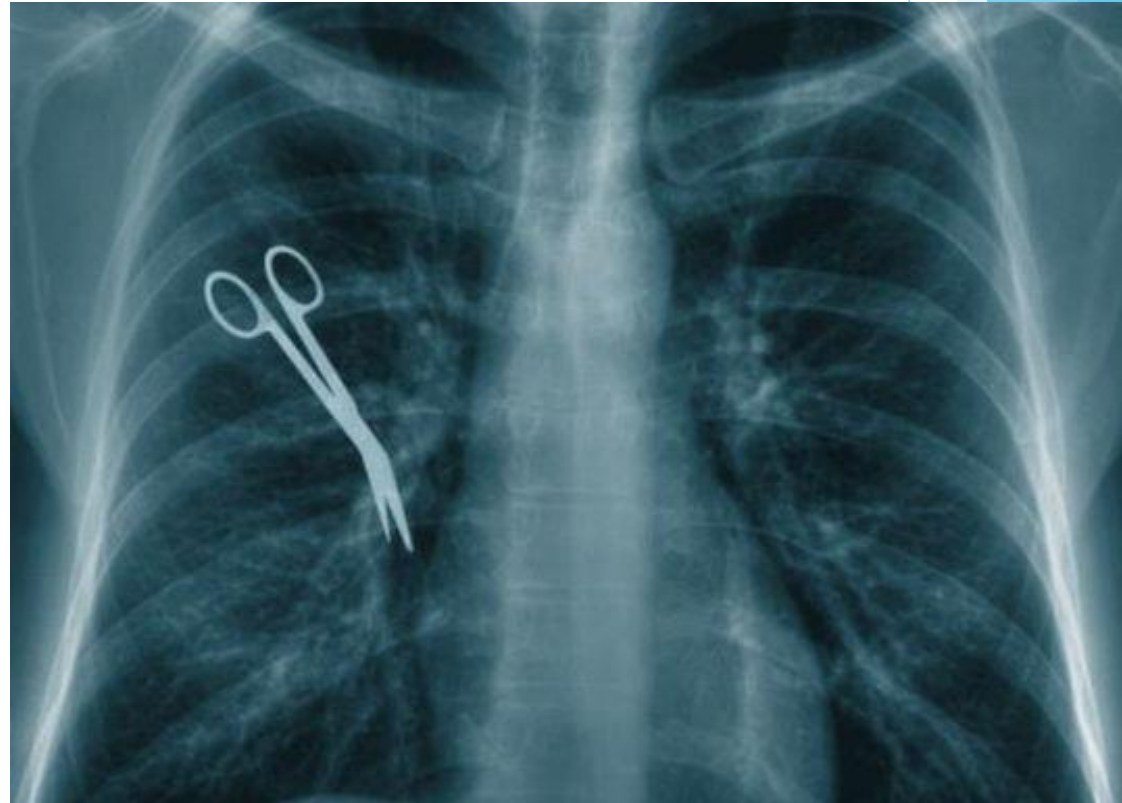
Types of Deadly Medical Errors in 1997



Data from: *To Err Is Human: Building a Safer Health System*. IOM, 2000.

The Most Common Medical Errors

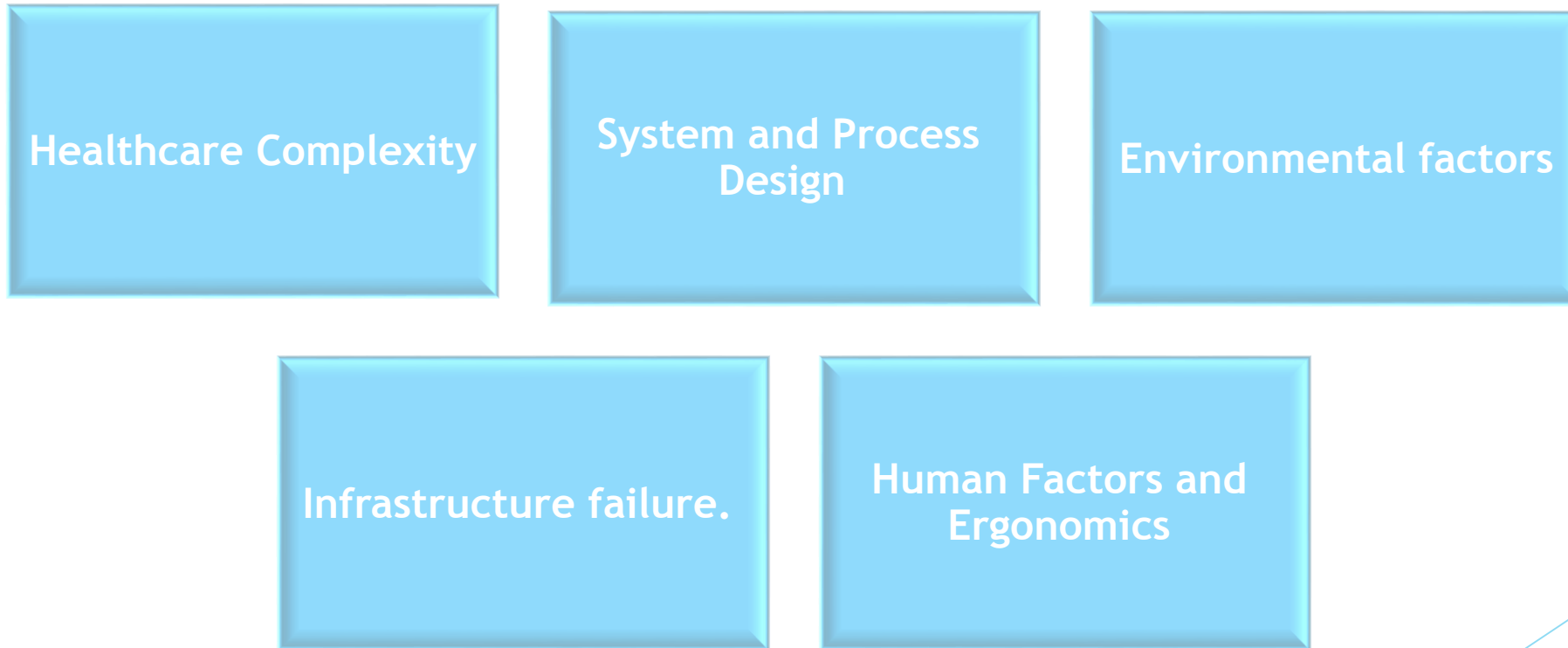
- ▶ Wrong site surgery (13.4%)
- ▶ Patient suicide (11.9%)
- ▶ Operative and post operative complication (10.8%)
- ▶ Delay in treatment (8.6 %)
- ▶ Medication error (8.1 %)
- ▶ Patient fall (6.4 %)



Burden of the Medical Errors

- ▶ How many of you know or had come cross any Medical Error?

Causes of Medical Errors



Causes of Medical Errors

1- Healthcare Complexity

- ▶ Complicated technologies
- ▶ Drugs interaction.
- ▶ Intensive care
- ▶ Prolonged hospital stay.
- ▶ Multidisciplinary approach

2- System and Process Design

- ▶ Inadequate communication,
- ▶ Unclear lines of authority

Cont:

3- Environmental factors.

- ▶ Over crowded services
- ▶ Unsafe care provision areas
- ▶ Areas poorly designed for safe monitoring

4- Infrastructure failure.

- ▶ Lack of documentation process
- ▶ Lack of continuous improvement process

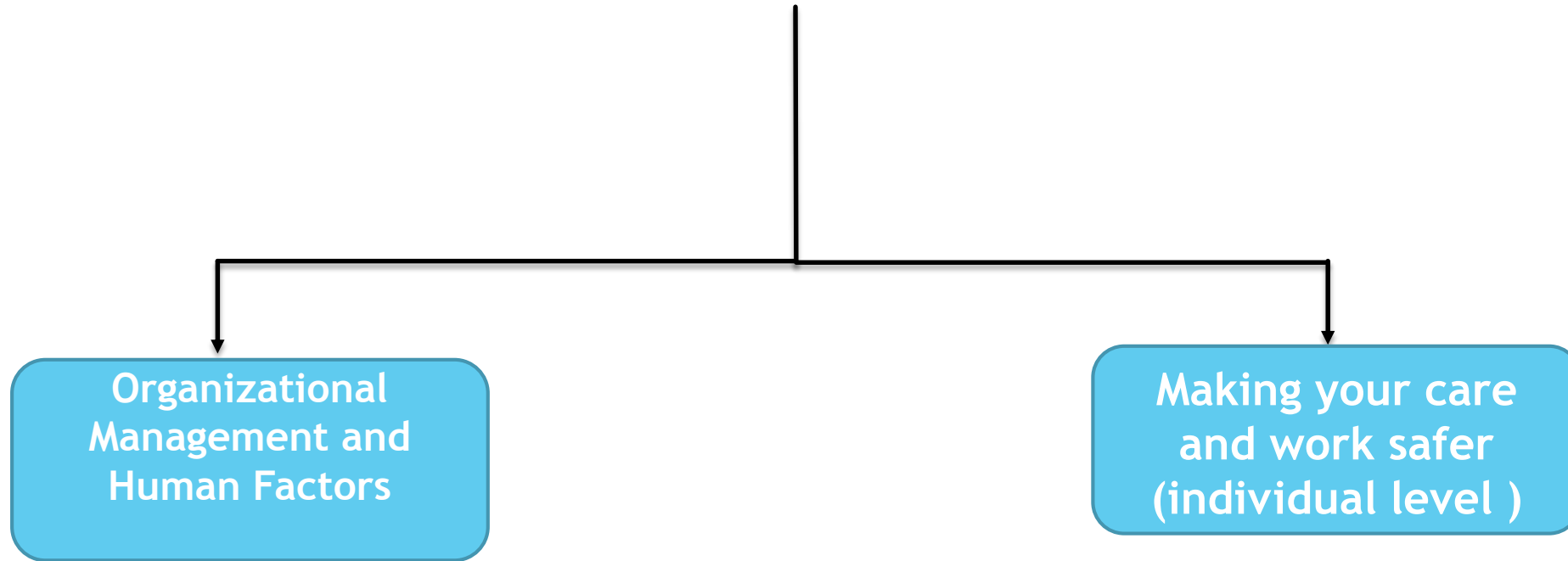
Cont:

5- Human Factors and Ergonomics

- ▶ Hungry
- ▶ Angry/ Emotions
- ▶ Late/ lazy
- ▶ Tired/fatigue/sleep less
- ▶ lack of skilled workers.
- ▶ Lack of training.



Actions to Reduce Medical Errors as Related to Humans Factors



Actions to Reduce Medical Errors as Related to Humans Factors

- ▶ **Part 1: Organizational Management and Human Factors**
 - ▶ **Developing a positive safety culture**
 - ▶ Just culture
 - ▶ Reporting culture (e-OVR Reporting system)
 - ▶ Learning culture (Morbidity and mortality review process)
 - ▶ **Human factors training in healthcare**
 - ▶ **Develop Clinical Practice Guidelines , protocols , algorithms.. etc**

Cont:

▶ Part 2: Making your care and work safer (individual level)

▶ **Stress**

- ▶ Focus first on the tasks that are high risk or where it is particularly important
- ▶ In emergency situations : use algorithms and protocols
- ▶ Quickly allocate a clear leader
- ▶ Consider if there is a way of running a simulation with your team

▶ **Complex calculations**

- ▶ Find out if there is a pre-calculated list available in your area
- ▶ Before you start the task, think about ways of managing or avoiding distractions. For example, ask a colleague to take your bleep for a minute
- ▶ Look at the dose strengths of ampoules in your drug cupboard
- ▶ Double check with your colleague

Cont

▶ **Storage**

- ▶ Look at the products you use and have stored. E.g Look-alike packaging

▶ **Physical demands**

- ▶ Physical tiredness :get enough sleeping before your duty
- ▶ Demands exceeding capability : Most people at some time overestimate their abilities or underestimate their limitations.

▶ **Teamwork**

- ▶ Briefing and debriefing can help teams develop a shared mental model of a planned procedure or a patient's clinical status
- ▶ SBAR (Situation, Background, Assessment, Recommendation)

Cont:

▶ **Reliance on vigilance and memory**

- ▶ When you have a large number of tasks to remember making lists can be a helpful
- ▶ Checklists or visible permanent reminders (The World Health Organization's (WHO) Surgical Safety Checklist)

Distractions

- ▶ Think about the tasks you do that require your focus (examples could be giving a blood transfusion, drug prescribing)

▶ **The physical environment**

- ▶ Poor lighting: Look at the lighting in the areas where you need to perform detailed or complex tasks

Case Study

- ▶ A child with a known penicillin allergy was prescribed and administered an intravenous dose of an antibiotic of the penicillin class2
- ▶ A child was due to have a pacemaker fitted. On pre-admission an allergy to penicillin was recorded. This was noted on both the nursing admission assessment form and the anesthetic record chart. Prior to operation, the allergy was discussed with the specialist pediatric cardiology registrar, the consultant pediatric anesthetist, anesthetic specialist registrar and the cardiology consultant. However, following the procedure the patient's plan included intravenous and oral penicillin.

Cont..... Case Study

How did this happen?

- ▶ There was no up-to-date protocol on what other antibiotics should be used if a pediatric cardiac patient has a penicillin allergy
- ▶ There was no clear record of the allergy in the medical
- ▶ No system was in place to prevent penicillin prescription when a known allergy was recorded.
- ▶ A number of appropriate checks were not followed prior to administration of the antibiotics.
- ▶ During independent checks, neither nurse checked allergy status, and both were under pressure to complete tasks.
- ▶ The patient's allergy band was on the same side as their identity band, both of which were covered with a bandage for an intravenous drip.

Cont..... Case Study

- ▶ Do you think the outcome could be quite different if human factors had been taken into account?
- ▶ How we can prevent such error by applying human factors in healthcare?

OVR(Occurrence Variance Reporting) or IR(Incident Reporting)

- ▶ Occurrence :An Occurrence is defined as any event or circumstance that deviates from established standards of care & safety.
- ▶ **OVR** :an internal form/system used to document the details of the occurrence/event and the investigation of an occurrence and the corrective actions taken.

KSUMC Reporting System

<http://10.135.196.38/Datix/live/index.php?action=login>

