# Human Factors
# & Patient Safety

Patient Safety
Lecture no. 2

## COLOR INDEX

- ● Main Text
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# Objectives:

**stay safe** Understand human factors and its relationship to patient safety.

## Knowledge requirement

**1** Know the meaning of the term human factors

**2** Understand the relationship between human factors and patient safety

## Performance requirement

Apply human factors thinking in the work environment
How the individual interacts

**!** There was another slides in the blackboard by Dr. Samar, BUT Dr. Nada said "Only study Dr. Jude's slides", so we only added Dr. Jude's slides.

✦ This lecture was presented by Dr. Jude Feda

✦ For the required reading **from Blackboard** click Here

# Human factors & ergonomics definitions
بيئة العمل

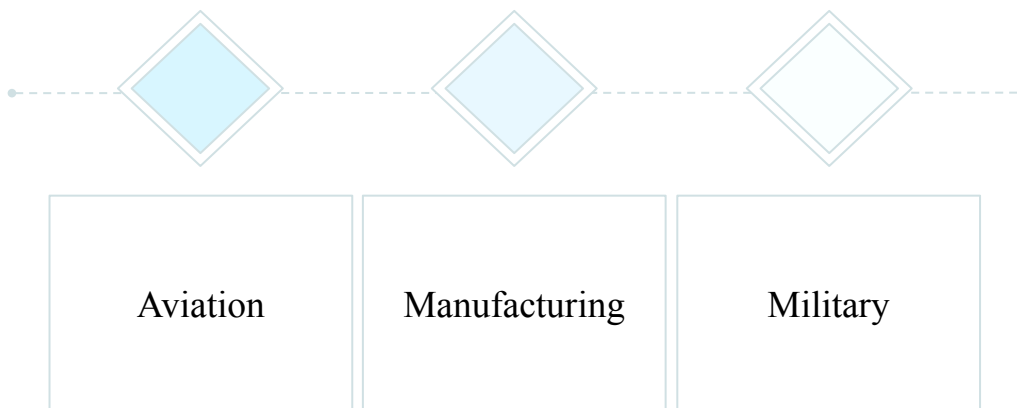| 1 | The study of all the factors that make it easier to do the work in the right way |
|---|---|

| 2 | Apply wherever humans work |
|---|---|

| 3 | Also sometimes known as ergonomics |
|---|---|

# Importance of human factors

**Importance has been recognized for a long time in:**

| Aviation | Manufacturing | Military |
|----------|---------------|----------|

**Importance in health care:** Why is it important?

- Human factors only recently acknowledged as an essential part of patient safety

- A major contributor to adverse events in health care

- All health-care workers need to have a basic understanding of human factors principles

# Importance of Human Factors Cont…

**Importance in health care:**

◆ Human factors experts:

Design improvements in the workplace and the equipment to fit human capabilities and limitations

Make it easier for the workers to get the work done the right way

Decrease the likelihood of errors occurring
Human always makes mistakes

**The range of workers**

Good human factors design in health care accommodates the entire range of workers

**1** Not just the calm, rested experienced clinician

**2** But also the inexperienced health-care workers who might be stressed, fatigued and rushing

## Examples

Prescribing and dispensing

Hand-over/hand-off information

Move patients

Order medications electronically

Prepare medication

If all of these tasks become easier for the health-care provider, then patient safety can improve

# Importance of Human Factors Cont…

Importance in health care:

◆ Examples of traps in health care?

○ Look-alike and sound-alike medications

○ Equipment design complexity e.g. infusion pump

Avoidable confusion is everywhere…



they are different

Health care is increasingly complex



# Human factors

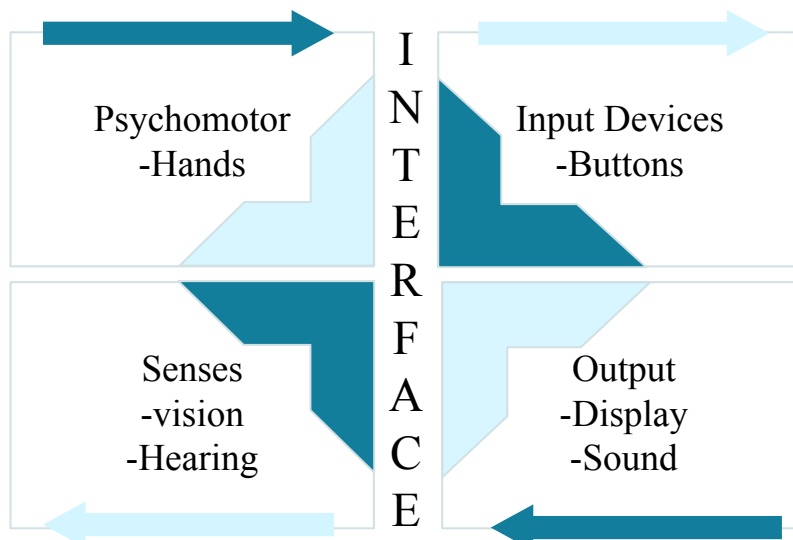| Acknowledges | Assumes | Designs |
|---|---|---|
| • The universal nature of human fallibility<br>• The inevitability of error | • Assumes that errors will occur | • Designs things in the workplace to try to minimize the likelihood of error or its consequences |

# Human factors design principles    Area of mistakes

Psychomotor
-Hands

Input Devices
-Buttons

I
N
T
E
R
F
A
C
E

Senses
-vision
-Hearing

Output
-Display
-Sound

Extra: to see the picture from the slide click HERE

US Department of Veteran affairs

# We cope quite well with complexity

Health-care workers are quite good at compensating for some of the complex and unclear design of some aspects of the workplace
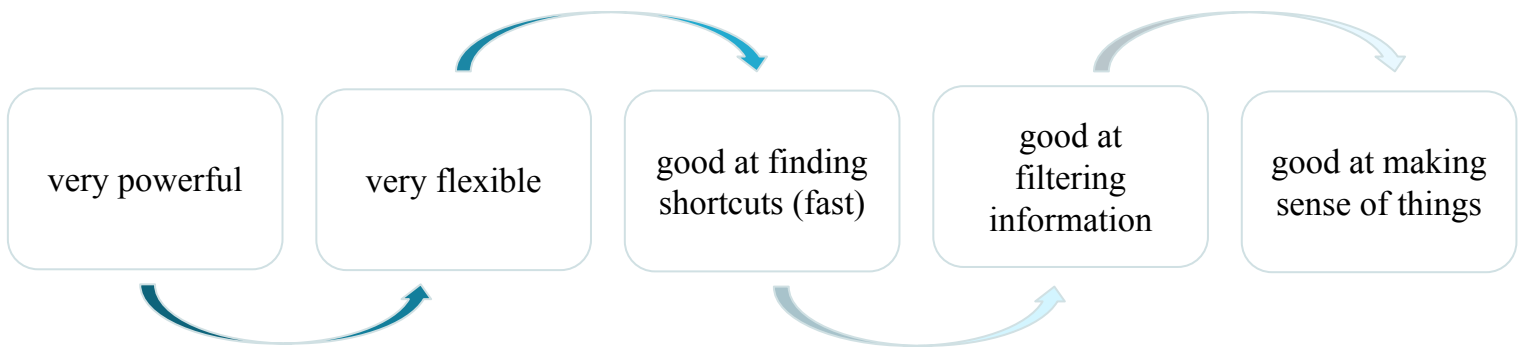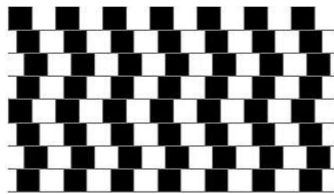
⬤ Equipment          ⬤ Physical layouts

◆ Because the human Brain is…

| very powerful | very flexible | good at finding shortcuts (fast) | good at filtering information | good at making sense of things |

◆ Sometimes our brain can play 'tricks' on us



Are the lines crooked or straight?

YELLOW BLUE ORANGE
BLACK RED GREEN
PURPLE YELLOW RED
ORANGE GREEN BLACK
BLUE RED PURPLE
GREEN BLUE ORANGE

Look at the chart Say the colour of the word, not the word itself
Why is it hard?

## Decisions & actions can be flawed…

• The fact that we can misperceive situations despite the best of intentions is one of the main reasons that our decisions and actions can be flawed such that "silly" mistakes are made.

## Human beings make "silly" mistakes

• Regardless of their experience, intelligence, motivation or vigilance, people make mistakes.

## The context of health care

• When errors occur in the workplace the consequences can be a problem for the patient
• A situation that is relatively unique to health care

Activity
Think about and then discuss with your colleagues any "silly" mistakes you have made recently when you were not in your place of work or study - and why you think they happened.

# The Error one of our nature

One definition of "human error" is "human nature"

Error is the inevitable downside of having a brain!

# What is an error?

The failure of a planned action to achieve its intended outcome

A deviation between what was actually done and what should have been done

James Reason
A definition that may be easier to remember is:
'Doing the wrong thing when meaning to do the right thing.'

## Situations associated with an increased risk of error

Especially if combined with lack of supervision - Charles Vincent

Unfamiliarity with the task

Inexperience

Shortage of time

Inadequate checking

Poor procedures

Poor human equipment interface

# Individual factor that predispose to error

Limited memory capacity, Further reduced by:

| Fatigue | Stress | Hunger | Illness |
|---------|--------|--------|---------|

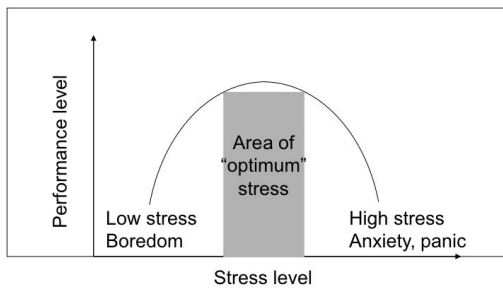| Language or cultural factors | Hazardous attitudes |
|------------------------------|---------------------|

**Fatigue** — 24 hours of sleep deprivation has performance effects ~ blood alcohol content of 0.1%

# Stress and performance



| Performance level | | |
| Area of "optimum" stress | | |
| Low stress Boredom | High stress Anxiety, panic | |
| Stress level | | |

The relationship between stress and performance

If you're
- **H**ungry
- **A**ngry
- **L**ate
or
- **T**ired .....

H
A
L
T

Don't forget
Was skipped

# A performance-shaping factors "checklist"

**I** — Illness

**M** — Medication — prescription, over-the-counter & others

**S** — Stress

**A** — Alcohol

**F** — Fatigue

**E** — Emotion
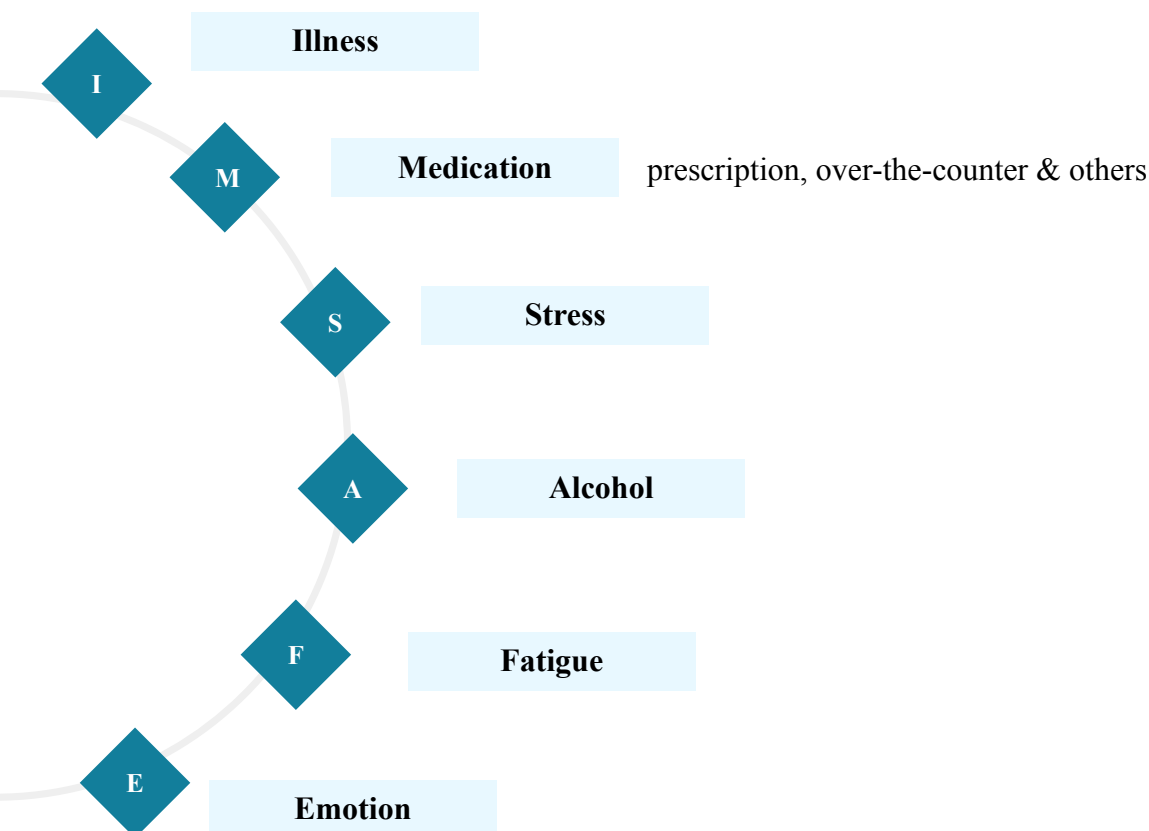
# Putting knowledge of human factors into practice

Apply human factors thinking to your work environment

Avoid reliance on memory

Review and simplify processes

Standardize common processes and procedures

Routinely use checklists

Decrease reliance on vigilance

# Summary

Errors are inevitable - even for experienced health professionals!

There are situations that can increase the likelihood of error Recognize them for your patient's sake - and yours!

Attention to human factors principles can lead to a reduction in error or its consequences

Human factors engineering is about designing the workplace and the equipment in it to accommodate for limitations of human performance.

# Team Leaders

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# Team Members

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