

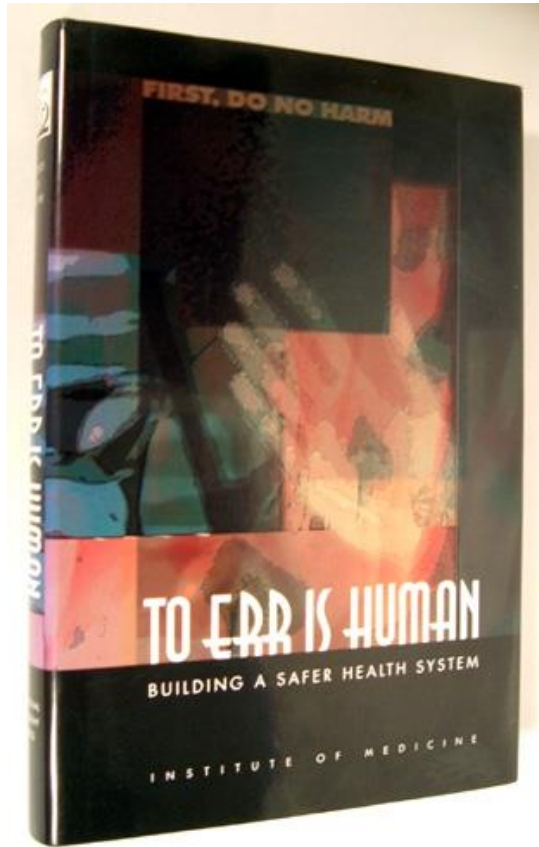


# Menselijk falen en systeemaanpak: Modellen en inzichten

Prof. Walter SERMEUS  
Leuven Institute voor Gezondheidszorgbeleid  
KU Leuven – 22.05.2017



# Rapport “To Err is human: building a Safer Health System”



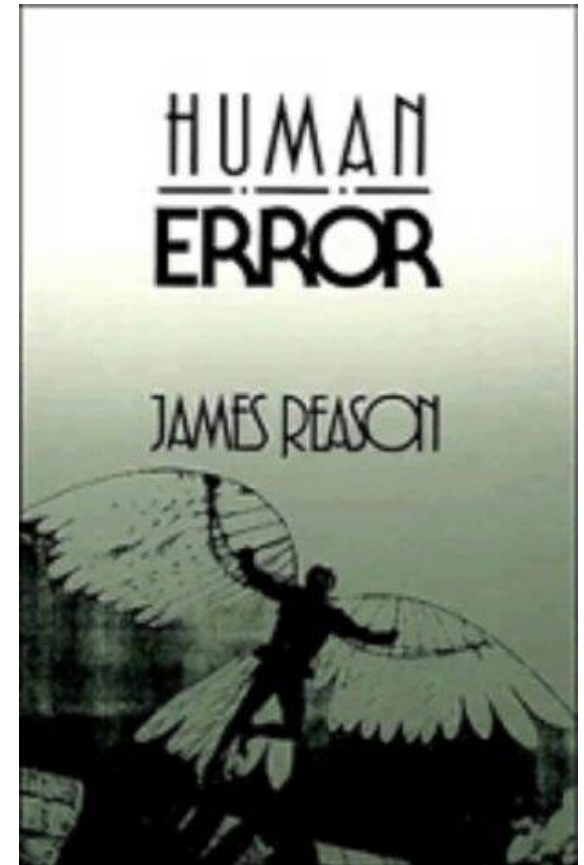
Human failure



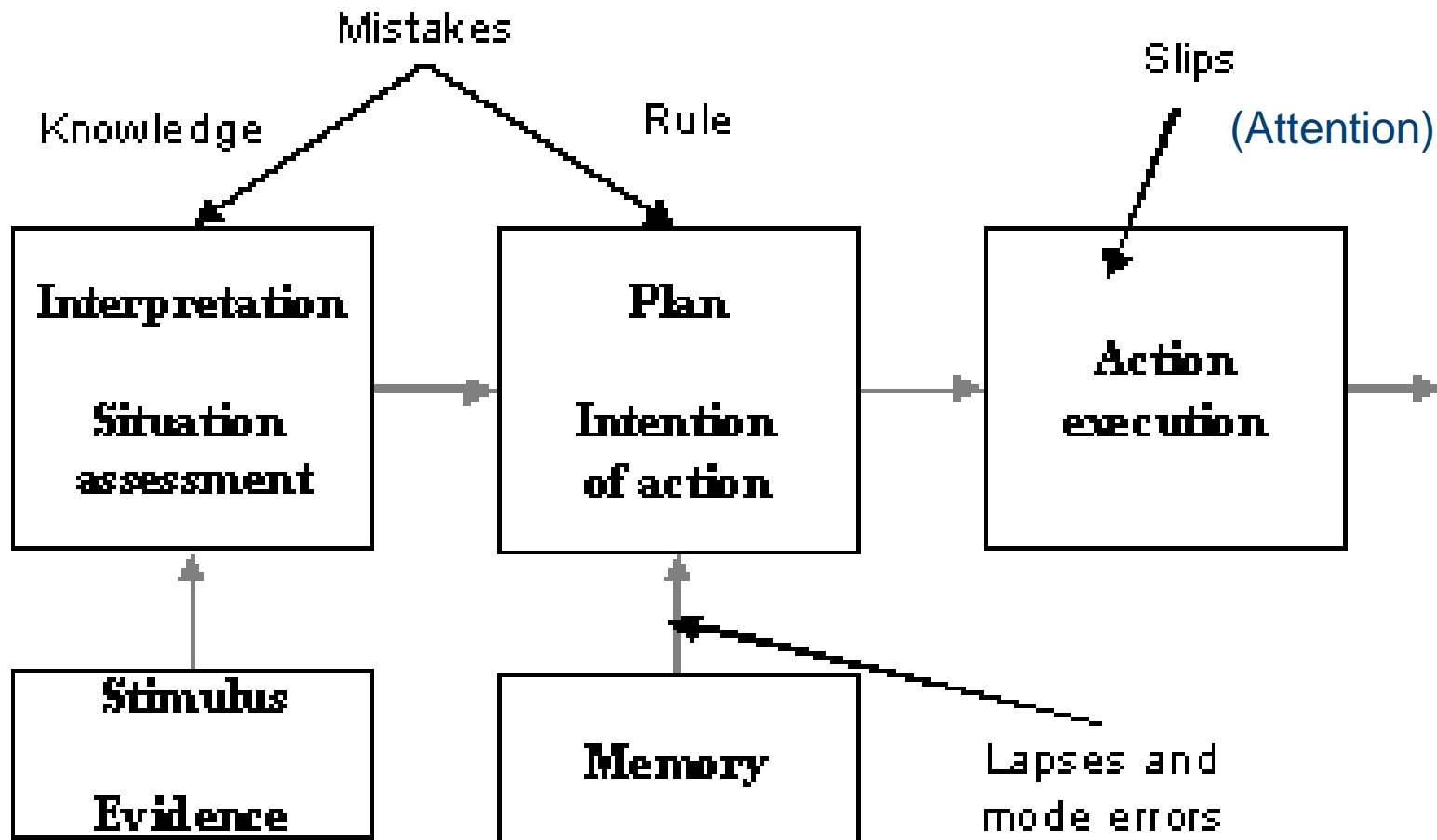
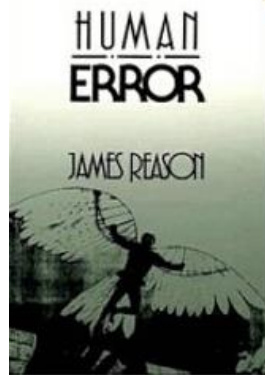
System approach

# Error

« Error will be taken as a generic term to encompass all those occasions in which a planned sequence of mental or physical activities fails to achieve its intended outcome, and when these failures cannot be attributed to the intervention of some chance agency »

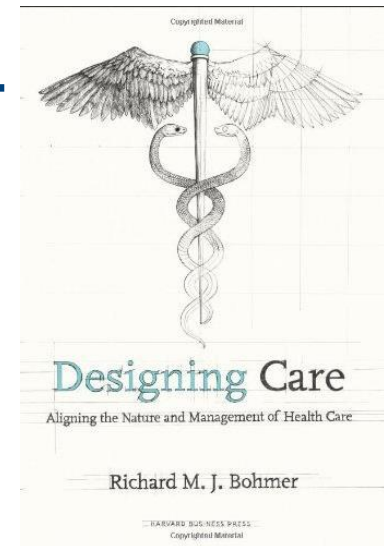


# Theory of human factors



# The theory in “words”

- We do not know what to do ...
- If we know we don't do it ...
- If we do it, we don't do it good enough ...

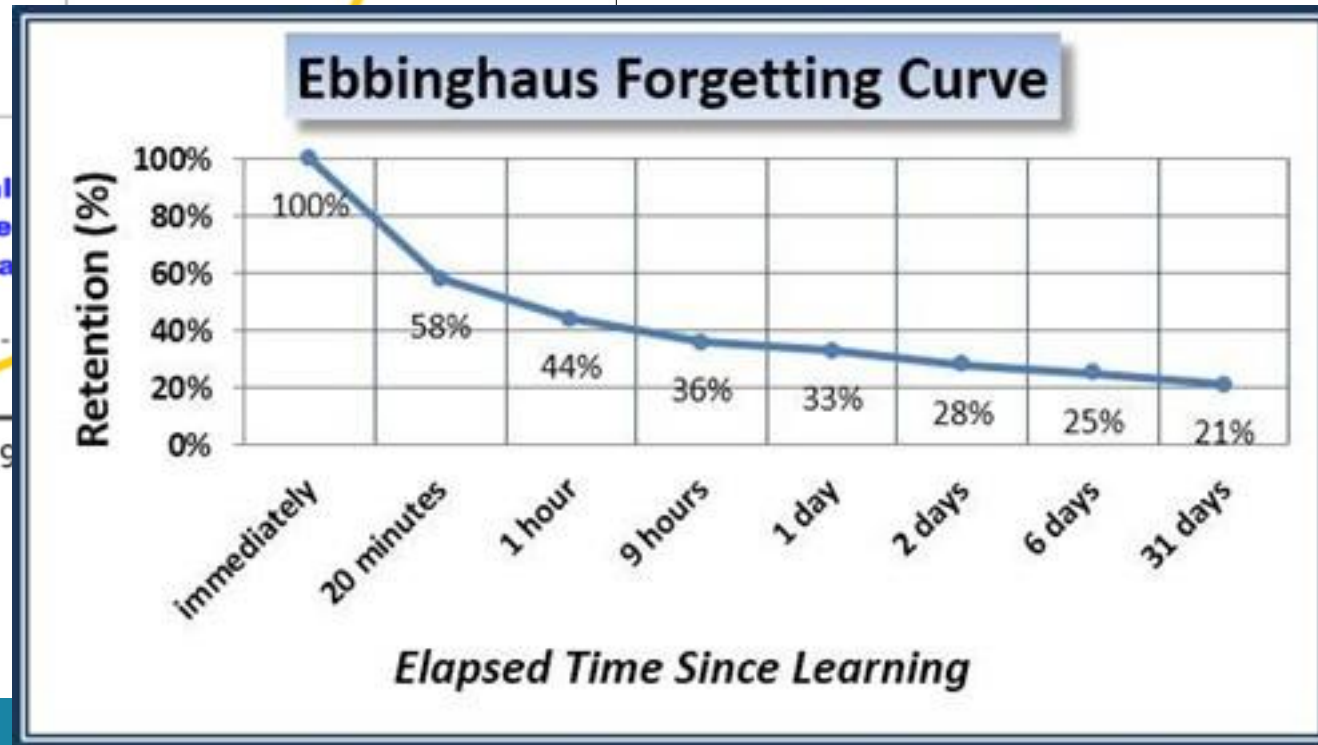
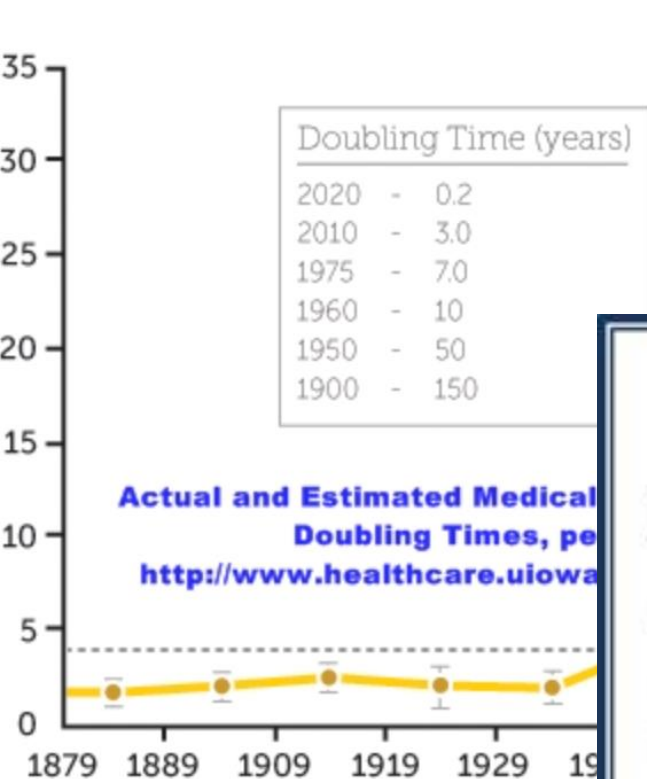


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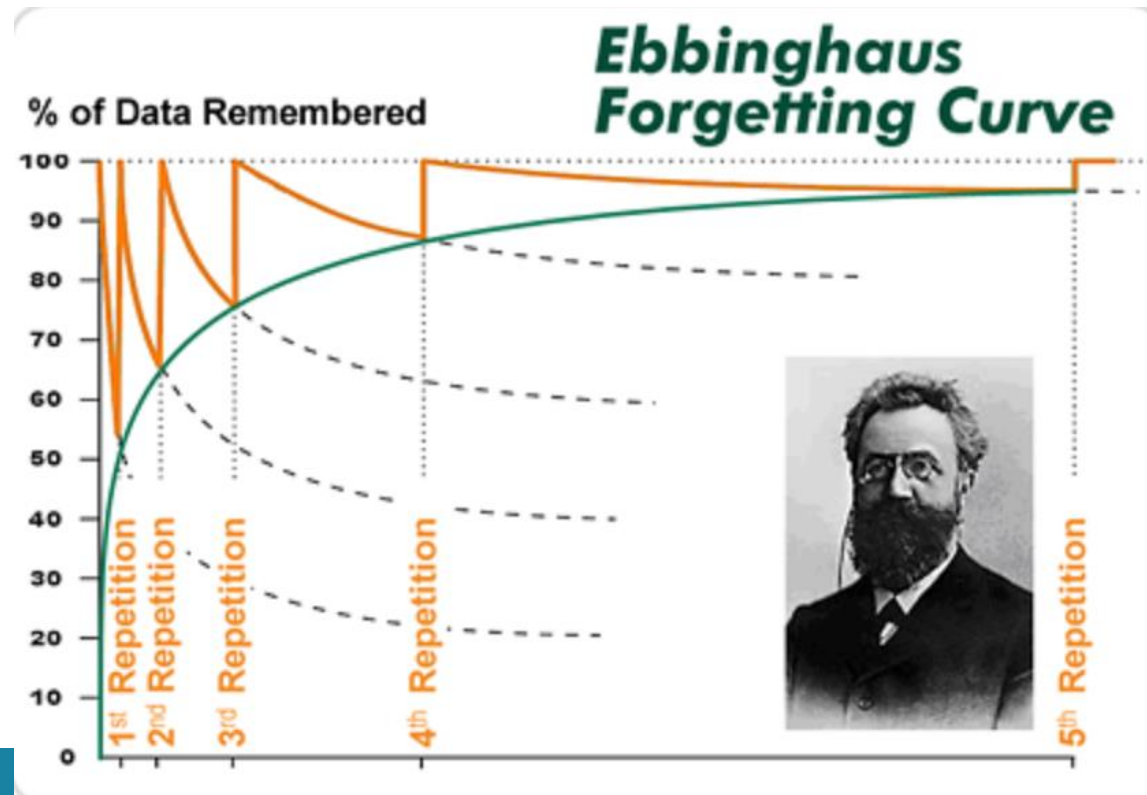
# We do not know what to do ...

## Buckminster Fuller “Knowledge Doubling Curve” (1982)



# If we know we don't do it ...

- Evidence versus expert opinion, experience, ...
- Interdisciplinary teamwork, continuity of care, ...
- Memory, documentation, reminders, ...



# Accuracy of documentation in the nursing record – 10 hospitals in the Netherlands

**Table 3. D-Catch Scores of accuracy of documentation in the nursing record**

Items of the D-Catch instrument	Scale*	Scale Scores in percentages <sup>†</sup>				n
Accuracy of the record structure	1–4	1	2	3	4	341
		1	37	34	28	
Accuracy of the admission documentation	2–8	≤3	>3, ≤5	>5, ≤6	>6, ≤8	341
		2	18	32	48	
Accuracy of the diagnosis documentation	2–8	≤3	>3, ≤5	>5, ≤6	>6, ≤8	336
		28	48	14	10	
Accuracy of the intervention documentation	2–8	≤3	>3, ≤5	>5, ≤6	>6, ≤8	341
		51	44	4	1	
Accuracy of the progress and outcome evaluation	2–8	≤3	>3, ≤5	>5, ≤6	>6, ≤8	341
		1	35	24	40	
Legibility	1–4	1	2	3	4	341
		3	30	66	1	

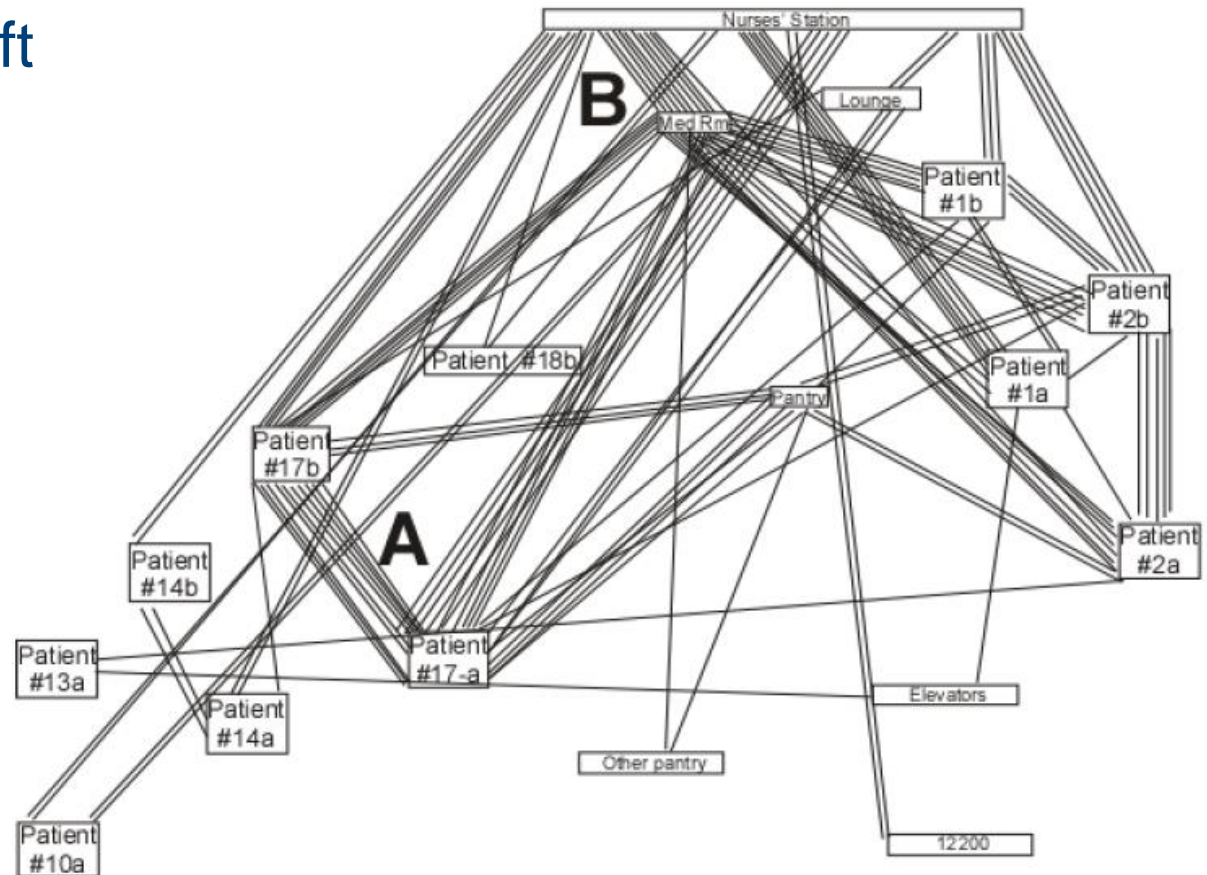
\*D-Catch measurement variable 1 and 6 on a 4-point scale, variable 2–5 as a sum score of a 4-point quality and quantity criteria scale (2–8).

<sup>†</sup>Scale Scores: 1 = poor; 2 = moderate; 3 = good; 4 = very good.



# If we do it, we don't do it good enough ... time pressure, workload, ....

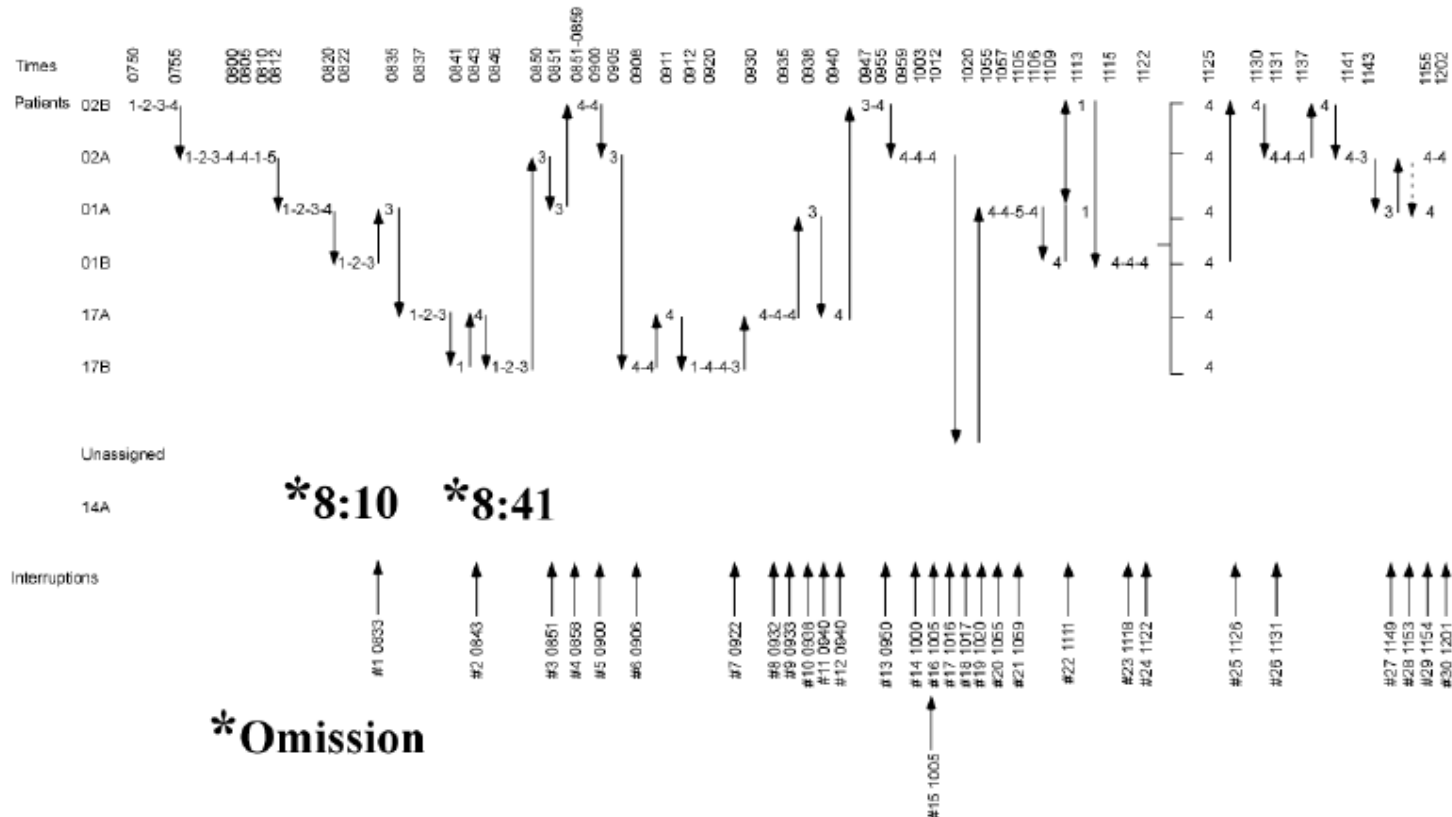
157 movements/shift



Each line represents the RN's movement from one location to another. For example, RN moves between patients 14A and 14B twice.

# Cognitive shifts

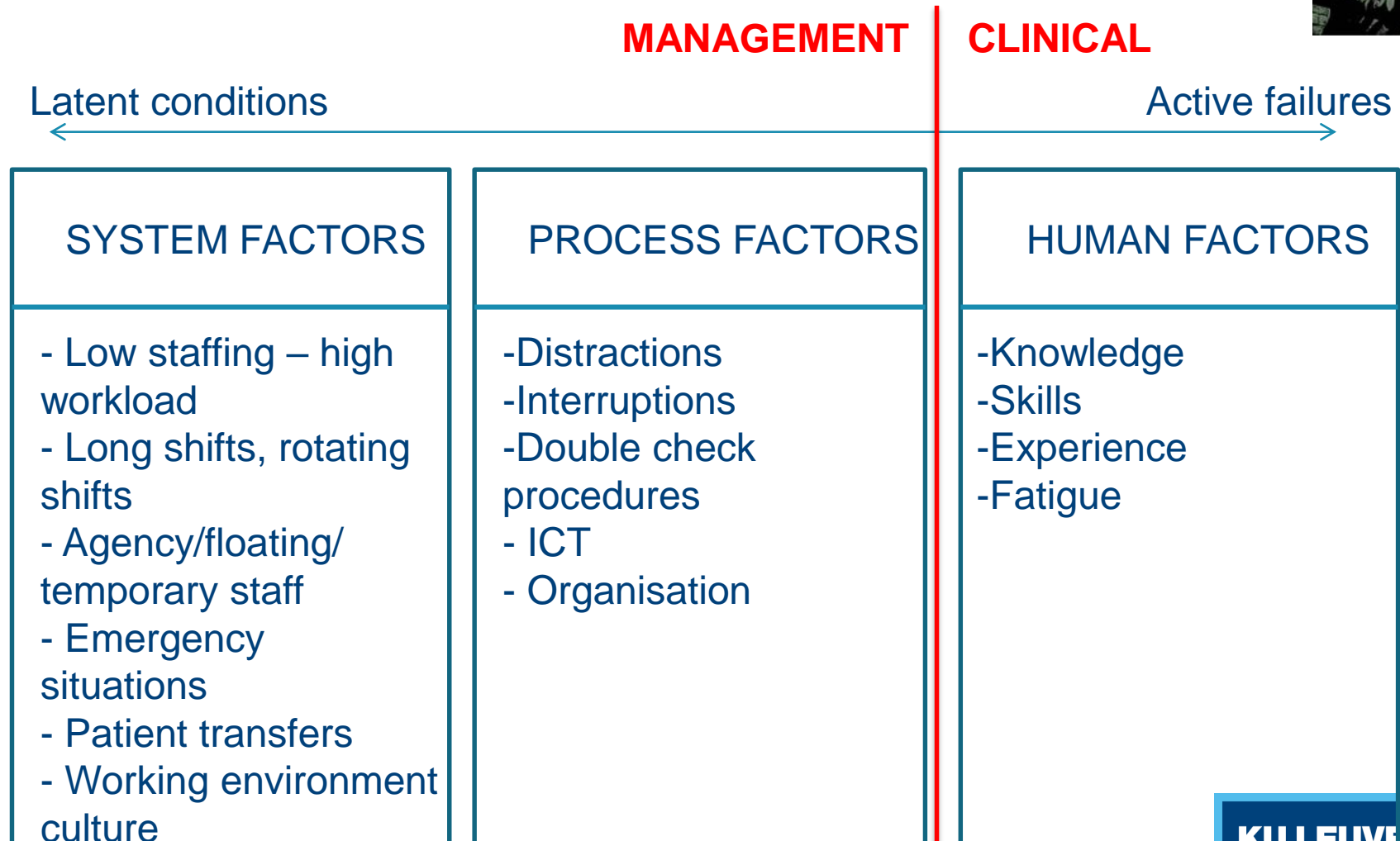
9,3 cognitive shifts/hour of 76 cognitive shifts/workshift



Each arrow represents a change in cognitive focus between one patient and another. For example, at 7:55, the RN shifts attention from patient 2B to patient 2A.



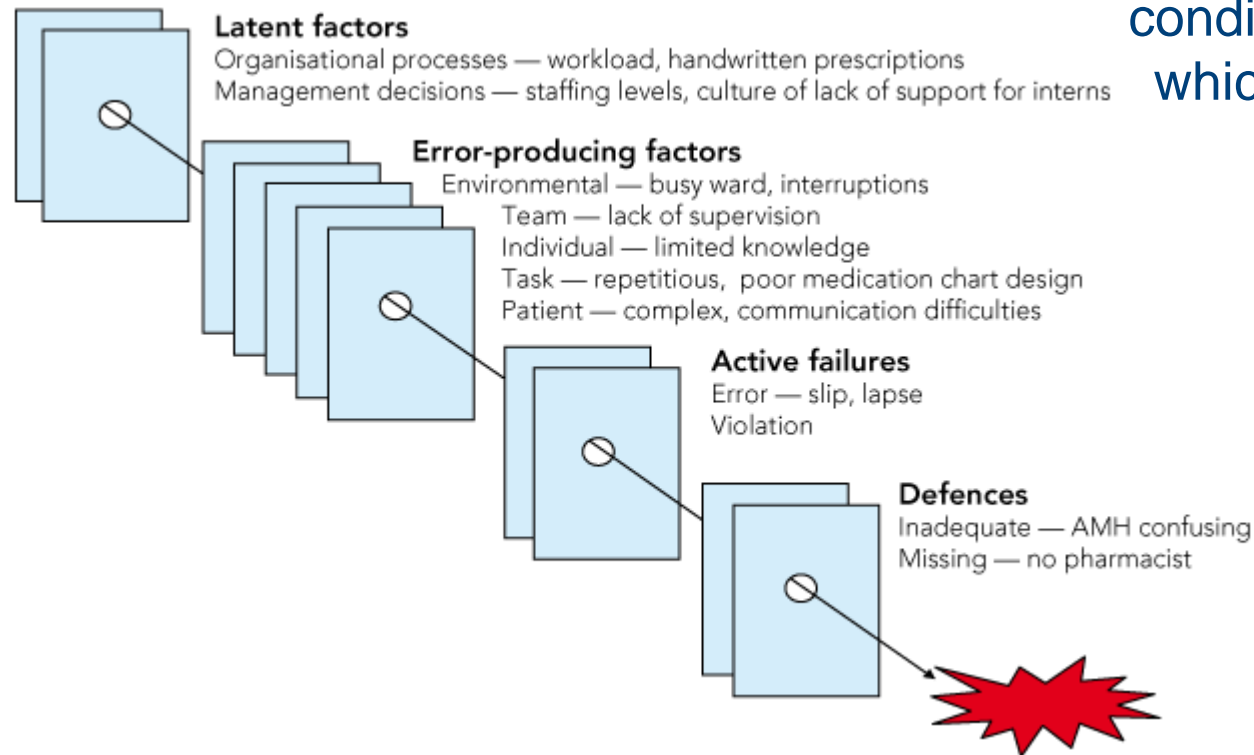
# System approach for human failure



# Swiss cheese model

We can't change the human condition,

but we can change the conditions under which humans work.



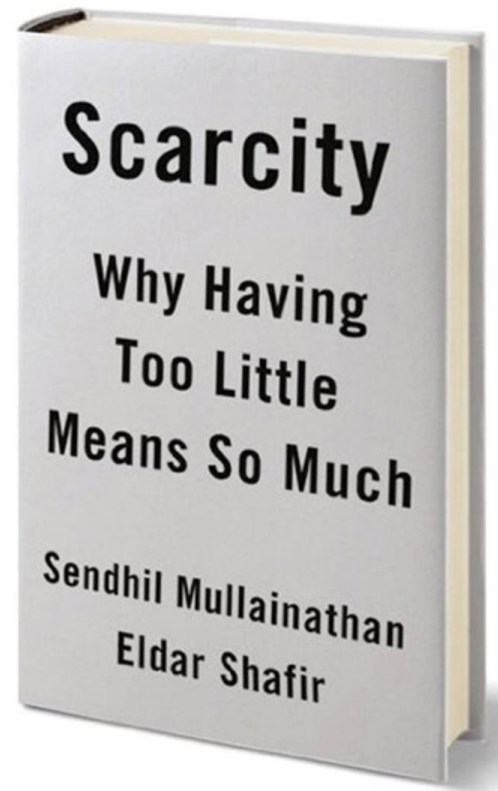
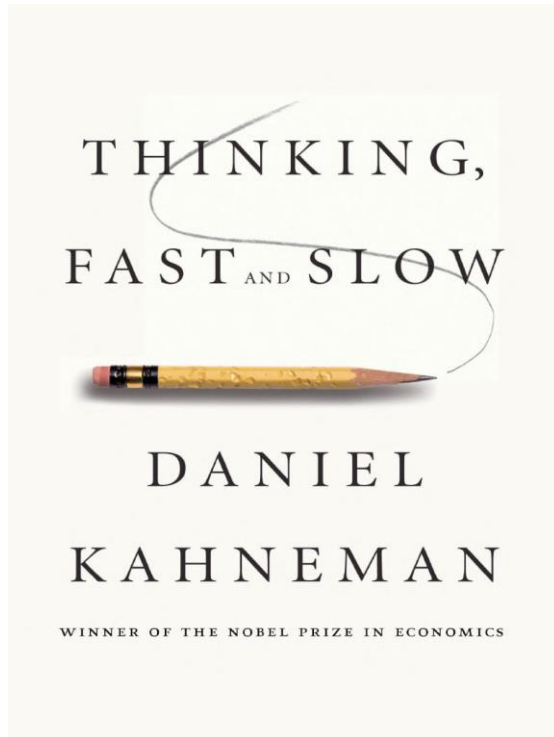
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# Importance of Latent Errors

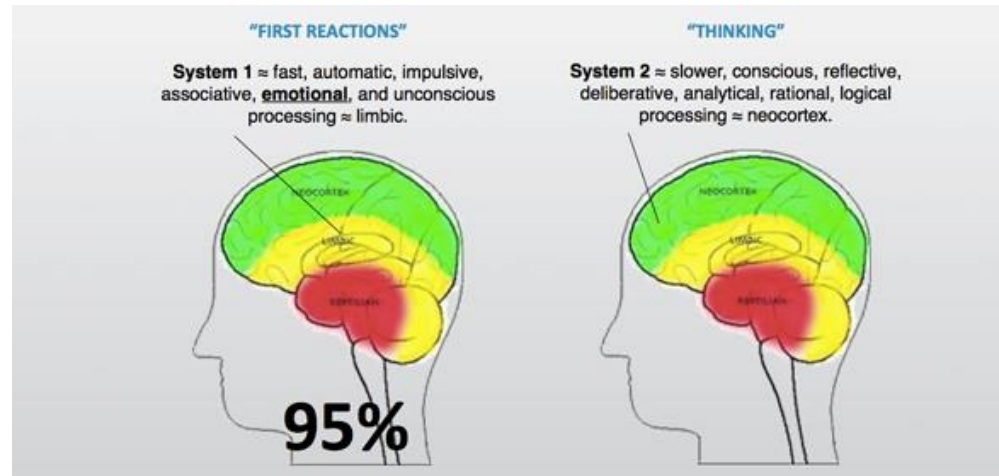
- Managerial decisions (or neglect) that set the stage for active errors thus defined as latent conditions:
  - Understaffing; failure to correct operational failures in clinical care; culture of poor team communication; non alignment of clinical and business missions;
- Triggers at bedside:
  - Interruptions from operational failures that erode vigilance, concurrent emergencies, communication failures, inexperience, fatigue, burnout, chaos

# What do scarcity do with our brain?





# Kahneman: Thinking fast and slow



## System 1 "Fast"

### DEFINING CHARACTERISTICS

Unconscious  
Effortless  
Automatic

WITHOUT self-awareness or control

"What you see is all there is."

### ROLE

Assesses the situation  
Delivers updates

## System 2 "Slow"

### DEFINING CHARACTERISTICS

Deliberate and conscious  
Effortful  
Controlled mental process

WITH self-awareness or control

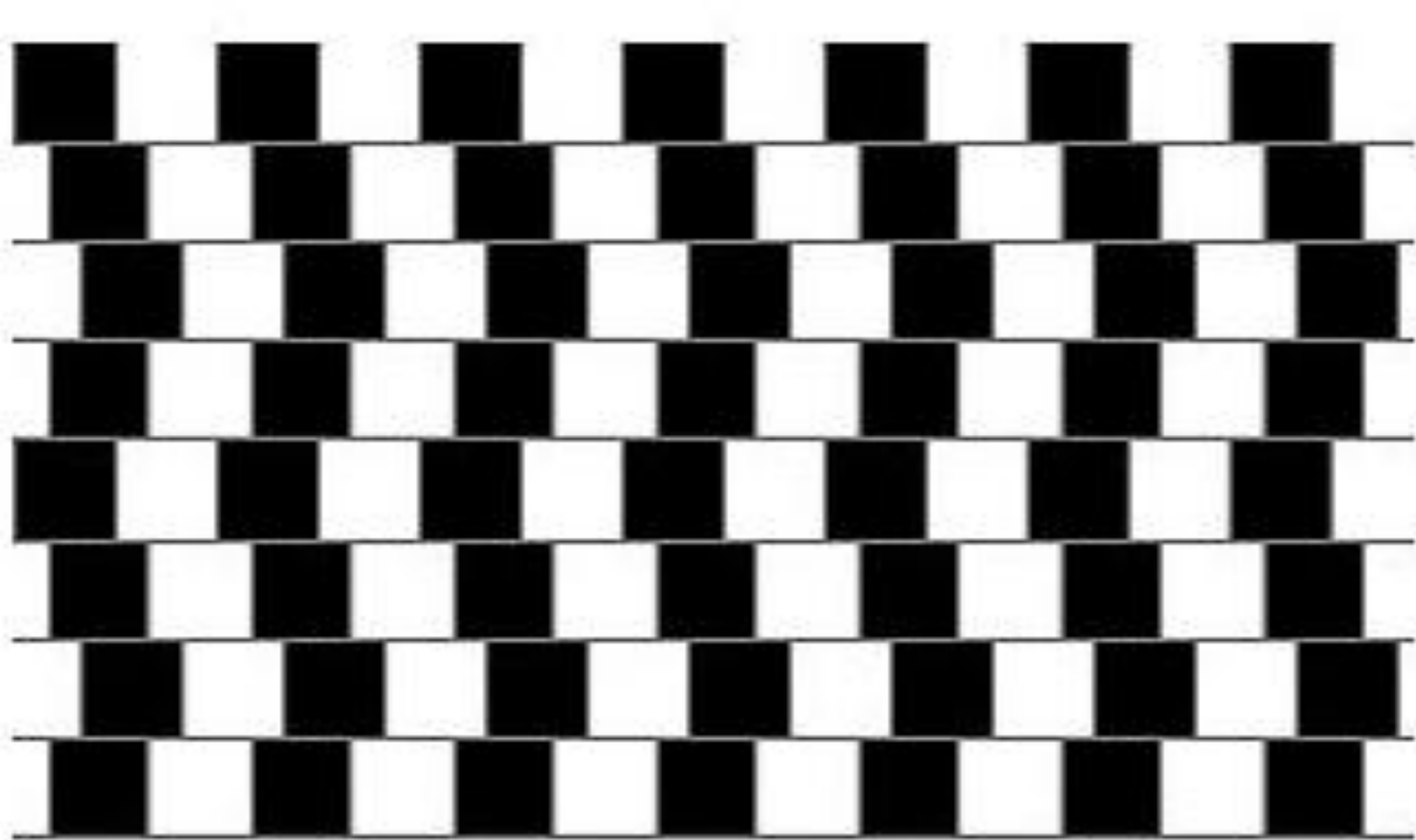
Logical and skeptical

### ROLE

Seeks new/missing information  
Makes decisions

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Are the lines crooked or straight?



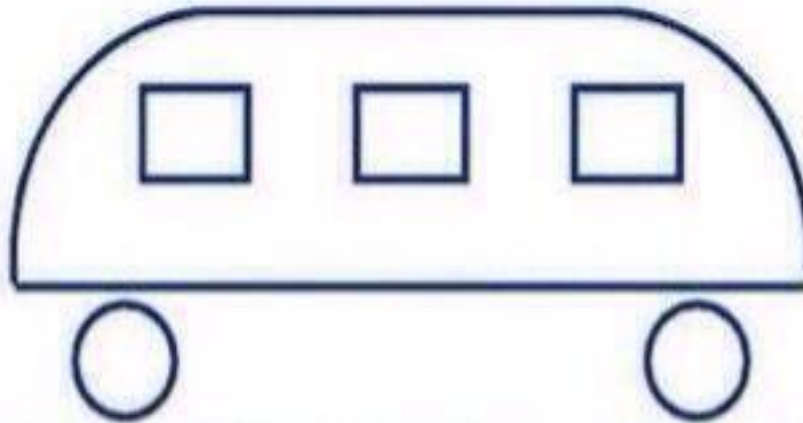
**YELLOW** **BLUE** **ORANGE**  
**BLACK** **RED** **GREEN**  
**PURPLE** **YELLOW** **RED**  
**ORANGE** **GREEN** **BLACK**  
**BLUE** **RED** **PURPLE**  
**GREEN** **BLUE** **ORANGE**

Look at the chart

Say the *colour* of the word, not the word itself

Which way is the bus going?

Right or left?



This question was asked to children of preschool, in the USA, with the same picture.

90% of them responded that the bus was going to the left.

When asked "Why?" they said "Because you can't see the door to get on the bus"

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# Look-, sound-alikes





# Functioning in a complex health system



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# Mullainathan & Shafir: effect of scarcity

The consuming cognitive load, or “mental bandwidth” is overloaded, for most poor

***This translates into:***

- 1) stronger tunnel vision, 2) less likely to resist what you should
- 3) more likely to forget things,
- 4) You have less patience, 5) more reactive; act first, think later, 6) losing up to 13 IQ points from acute or chronic stress





# Tijd- of geldgebrek?

Dit is wat het met je doet!



1

## Je wordt efficiënter

Schaarste kan je dwingen efficiënter te werken. Schaarste zorgt ervoor dat je iets gedaan krijgt wat je louter op eigen kracht niet zo makkelijk voor elkaar zou krijgen.

## Je wordt een expert

Arme mensen weten precies wat een euro waard is. Als je genoeg geld hebt weet je niet wat een pak melk kost.

2

3

## Je krijgt een tunnelvisie

Je sluit andere dingen buiten. Je krijgt een eenzijdige concentratie op het schaarsteprobleem. Andere misschien wel belangrijker dingen bevinden zich buiten de tunnel, zijn moeilijker te zien en makkelijker te onderschatten.

4

## Je wordt dommer

Schaarste belast je bandbreedte. Dat houdt in dat het vermogen om problemen op te lossen, logisch te redeneren en abstract te denken afneemt (onafhankelijk van specifieke ervaring of kennis). **Schaarste berooft je van 10 – 15 IQ-punten** en dat heeft niets te maken met je aangeboren capaciteit.

9

## Je zit in de val

Je kunt er niets aan doen:

Schaarste veroorzaakt nog meer schaarste. Aanvankelijke schaarste wordt versterkt door gedrag dat de schaarste vergroot (bv het doen van een onverstandige aankoop omdat de bandbreedte is beperkt). **Schaarste neemt bezit van je denken.**

8

## Je maakt fout op fout

Je hebt geen speelruimte (ruimte over aan tijd of geld). Daarom heb je geen armslag tot het maken van fouten. Bij schaarste is er niet alleen minder ruimte om fouten te maken, door de belasting van de bandbreedte ben je ook nog eens geneigd méér fouten te maken.

5

## Je wordt onzorgvuldiger

Schaarste belast dus je bandbreedte en dat houdt ook in dat het vermogen om orde te scheppen afneemt, waaronder vooruitdenken, aandacht aan iets besteden, het in gang zetten of onderdrukken van handelingen en het beheersen van impulsen. **Schaarste maakt het moeilijker om impulsen te bedwingen en het leidt tot onzorgvuldigheid.**

7

## Het kost tijd

Je besluit gemakkelijk om te gaan multitasken. De tijdsbesparing die dat oplevert is in de tunnel zichtbaar is terwijl de problemen – multitasken kost uiteindelijk méér tijd - buiten beeld blijven.

6

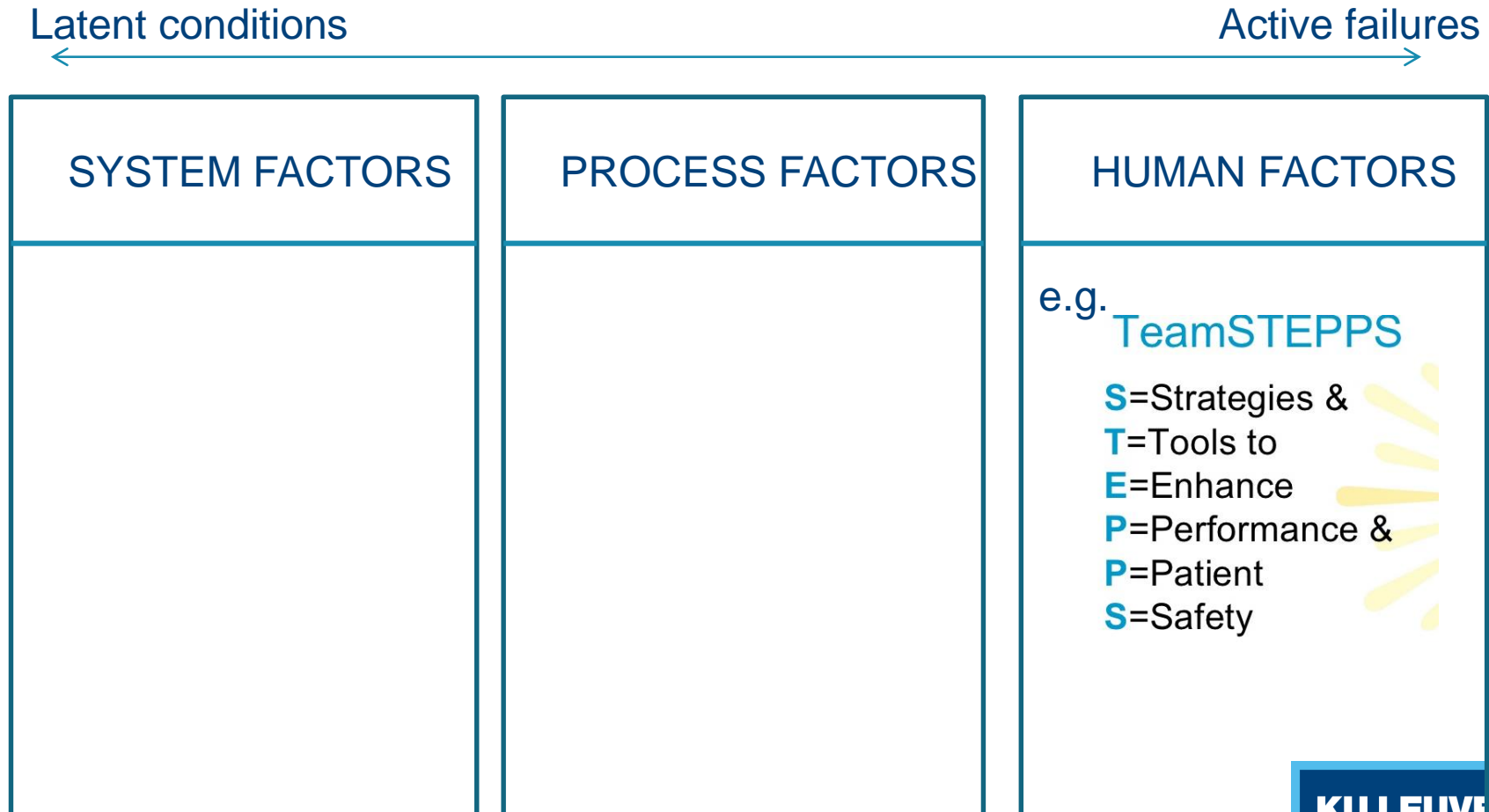
## Je wordt kortzichtig

Je negeert belangrijke maar niet urgente kwesties. De nuttige effecten daarvan liggen immers buiten de tunnel. Schaarste is een probleem van vandaag. Morgen is van later zorg.

## Wat is schaarste?

Schaarste is minder hebben dan dat je voor je gevoel nodig hebt.

# Some approaches & models for patient safety



# TeamSTEPPS



**I'M Safe<sup>1</sup>**

- ✓ **I** = Illness
- ✓ **M** = Medication
- ✓ **S** = Stress
- ✓ **A** = Alcohol and Drugs
- ✓ **F** = Fatigue
- ✓ **E** = Eating and Elimination

I am **C** ONCERNED!  
 I am **U** NCOMFORTABLE!  
 This is a **S** AFETY ISSUE!  
*"Stop the Line"*

**TeamSTEPPS**

**SITUATION**  
What is the situation?

**BACKGROUND**  
What is the clinical background?

**ASSESSMENT**  
What is the problem?

**REQUEST/RECOMMENDATION**  
What do I recommend / request to be done?

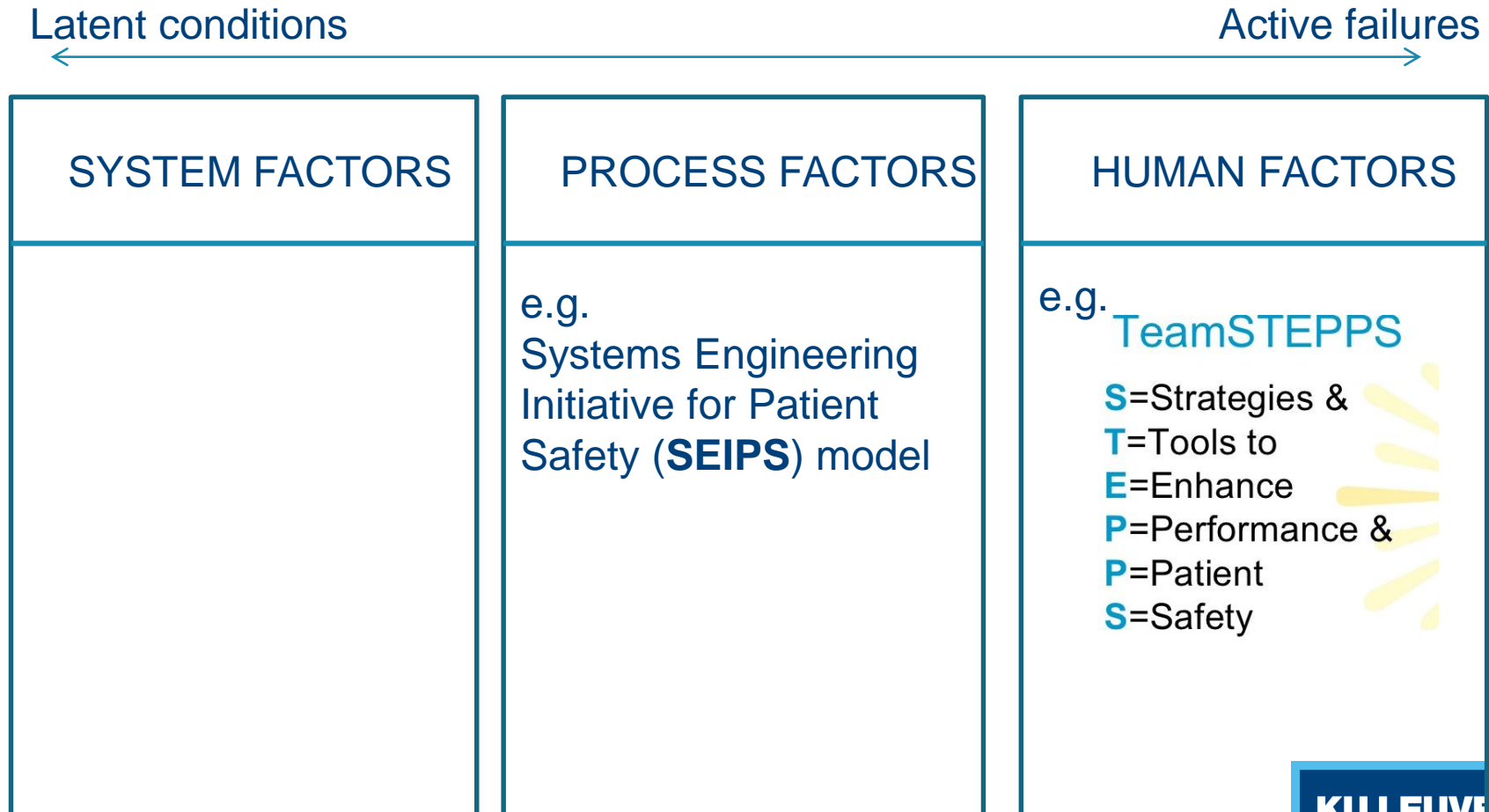
Structured Communication Tool

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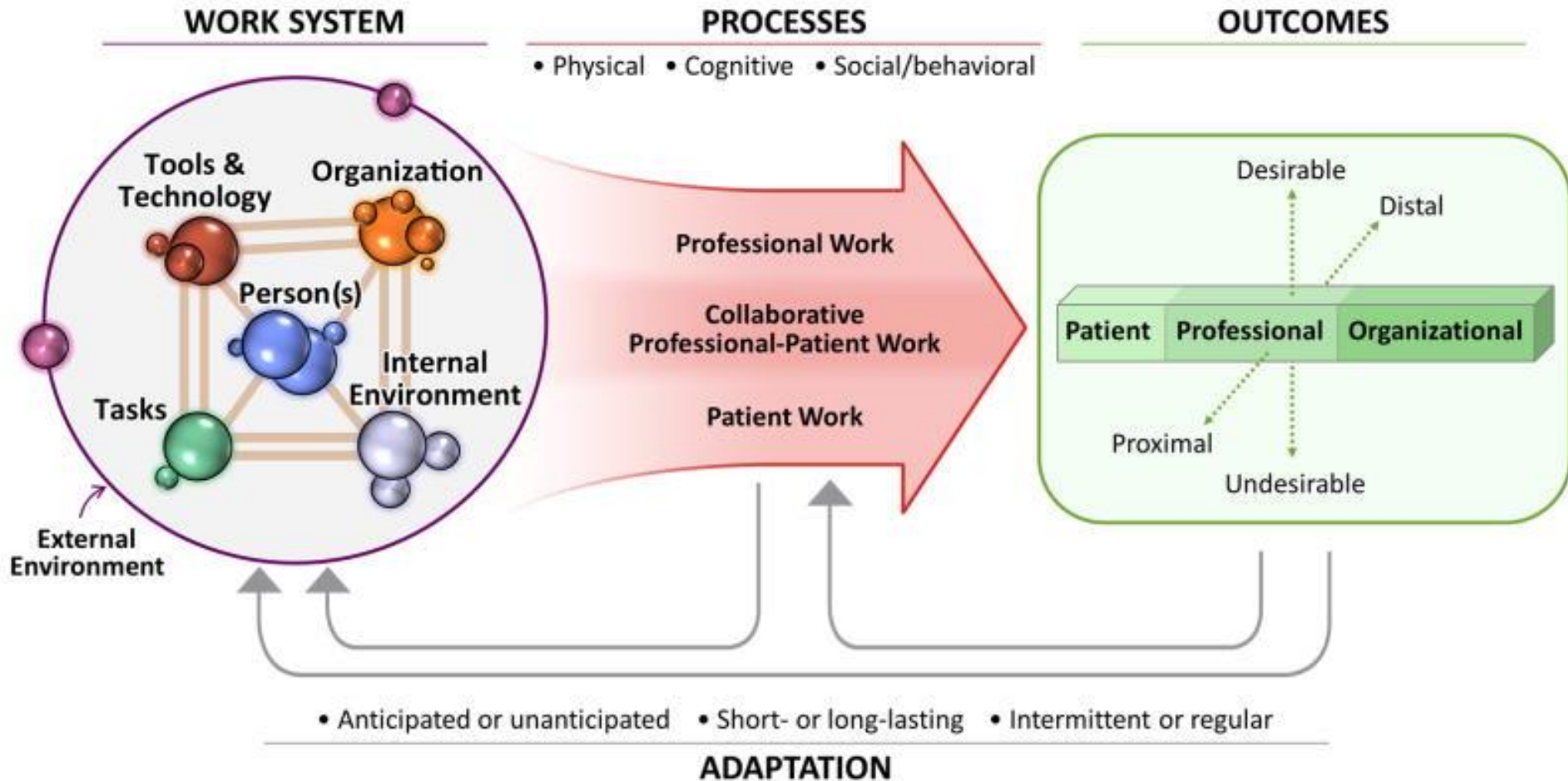


# Some approaches & models for patient safety

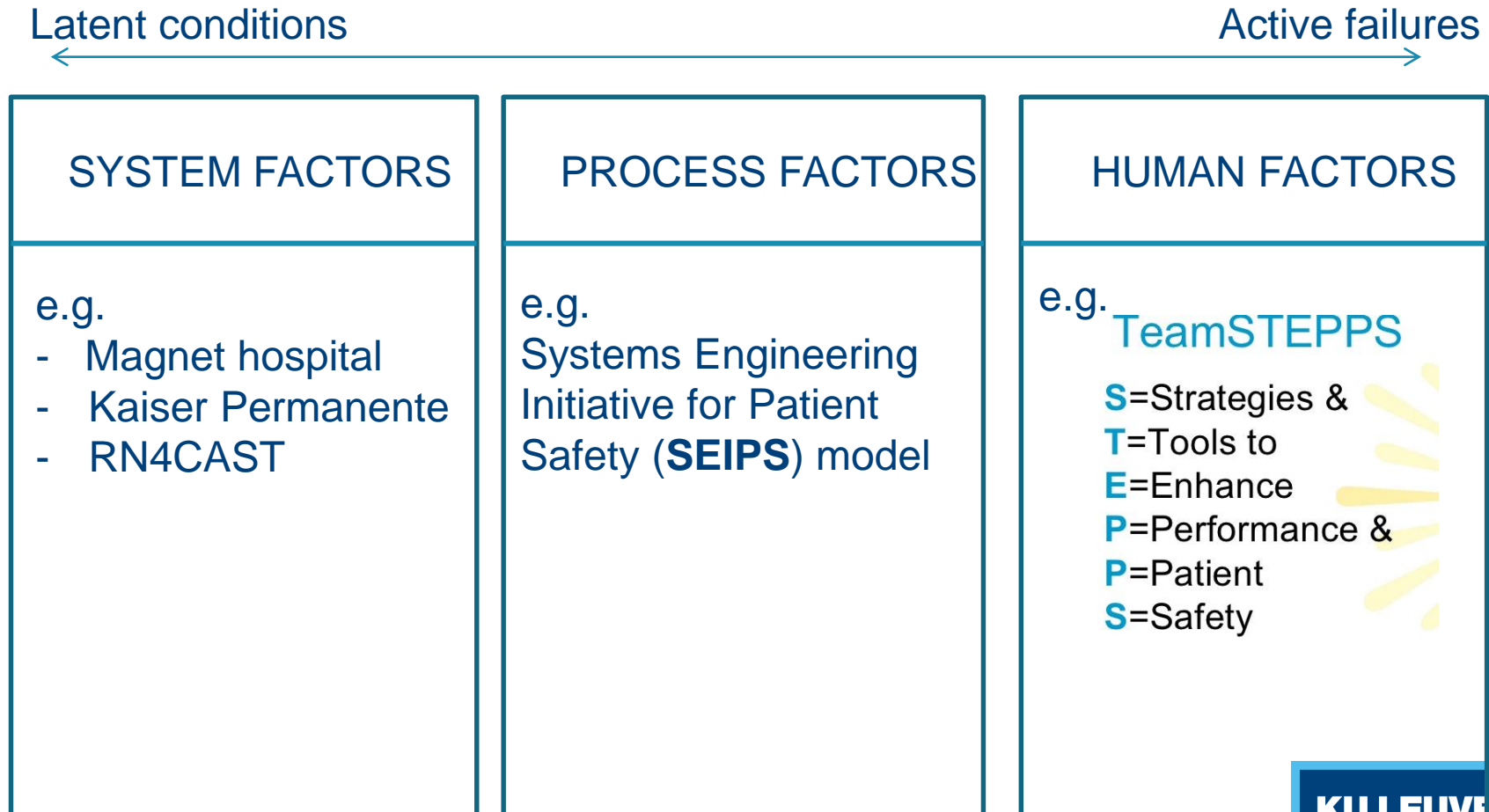


# SEIPS 2.0 model

## Systems Engineering Initiative for Patient Safety



# Some approaches & models for patient safety



## Odds ratios indicating the effect of hospitalization in a Kaiser Permanente hospital and in hospitals with varying nurse work environment factors on patient outcomes

	Kaiser	Nursing factors individually	Nursing composite	Kaiser and nursing composite
	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
<b>Mortality</b>				
Kaiser	0.80* [0.67, 0.96]	—	—	0.91 [0.72, 1.16]
Practice environment	—	0.68*** [0.56, 0.82]	—	—
Staffing	—	1.06* [1.01, 1.12]	—	—
% of BSN nurses	—	0.97* [0.94, 1.00]	—	—
Nursing composite	—	—	0.62*** [0.47, 0.80]	0.67** [0.48, 0.94]
<b>Failure to rescue</b>				
Kaiser	0.80* [0.67, 0.95]	—	—	0.91 [0.73, 1.13]
Practice environment	—	0.68*** [0.56, 0.82]	—	—
Staffing	—	1.05* [1.00, 1.11]	—	—
% of BSN nurses	—	0.97* [0.94, 1.00]	—	—
Nursing composite	—	—	0.62*** [0.47, 0.81]	0.68** [0.49, 0.95]

Odds ratios come from logistic regression models estimated for each outcome individually. Each model includes a variable indicating whether the patient is in a Kaiser hospital or a hospital that is neither Kaiser nor Magnet. All results shown are from models that controlled for patient characteristics.

\* $p < .05$ .

\*\* $p < .01$ .

\*\*\* $p < .001$ .

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# Lucian Leape Institute:

## Transforming healthcare: the safety imperative

- “sick system syndrome”
  - Most do not recognise that safety should be a precondition, not a priority
  - Many physicians do not know how to be teamplayers and regard other health workers as assistants
  - Nurses are trapped in rigid organisational structures in which they often spend more time tending to their records than to their patients
  - Too many practitioners—doctors, nurses, pharmacists, therapists, technicians—function in “silos” ...
- A vision for Transformation

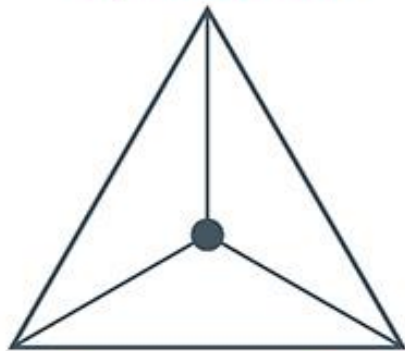
# Vision for Transformation

- Transparency
- Consumer engagement: “nothing about me without me”
- Integrated care platforms
  - Patient centredness, work assignment, support, community linkage, variation management, transparency
- Joy and meaning in work
- Reform of medical (health professional) education

# Joy and meaning in work

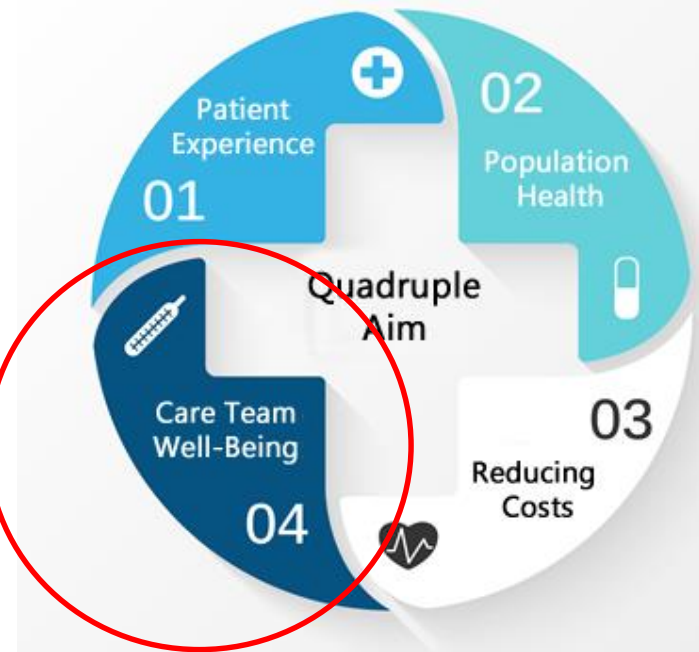
## The IHI Triple Aim

Population Health



Experience of Care

Per Capita Cost



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# Education of health professionals



Flexner-report 1910



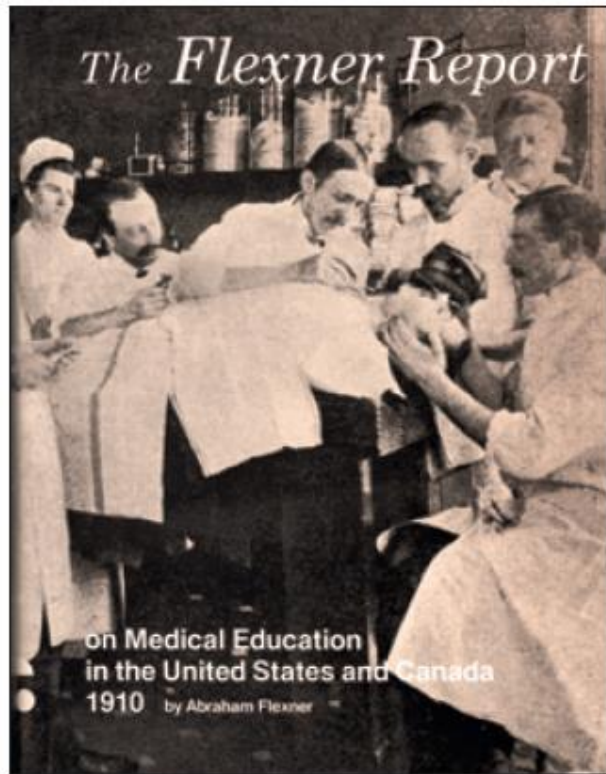
Lancet-report 2010 (Frenk et al.)

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# Blue print of current health professional education

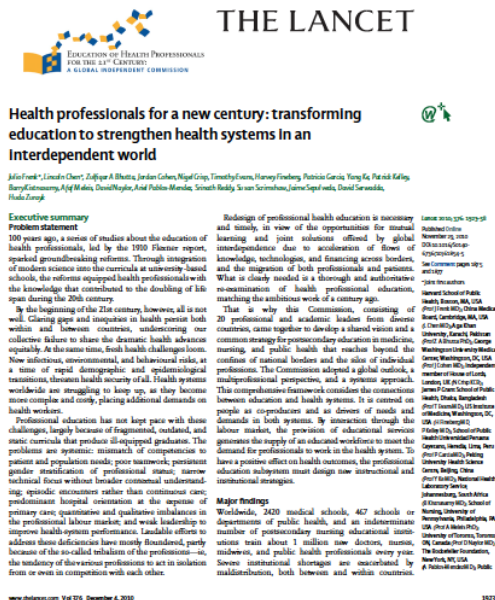


Flexner-report 1910

- Science-based:
  - Two years of basic biomedical sciences, based in universities.
  - followed by two years of clinical training, based in (academic) hospitals
- from an apprenticeship model to an academic model
- Research was to be viewed not as an end in itself but as a link to improved patient care and clinical training

# Critique Lancet-commission

The Lancet Commissions



- Professional education has not kept pace with the challenges of a complex health system
  - poor teamwork
  - predominant hospital orientation at the expense of primary care
  - Narrow technical focus
  - Low contextual understanding
  - episodic encounters rather than continuous care
  - weak leadership to improve health-system performance

Lancet-report 2010  
(Frenk et al.)

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# Recommendation Lancet-commission (1)

The Lancet Commissions

## ○ Transformative learning



	Objectives	Outcome
Informative	Information, skills	Experts
Formative	Socialisation, values	Professionals
Transformative	Leadership attributes	Change agents

Lancet-report 2010  
(Frenk et al.)

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# Recommendation Lancet-commission (2)

The Lancet Commissions

## ○ Interdependence in education

**THE LANCET**

EDUCATION OF HEALTH PROFESSIONALS  
FOR THE 21<sup>ST</sup> CENTURY  
A GLOBAL INDEPENDENT COMMISSION

**Health professionals for a new century: transforming education to strengthen health systems in an interdependent world**

*Mina Frenk\*, Linde Chen†, Zulqapri A. Bhutta\*, Jordan Cohen, Nigel Crisp, Timothy Evans, Harvey Fineberg, Patricia Garcia, Yong Gu, Patrick Kelley, Barry Kohn, Mary Kay Mahoney, David Naylor, Aron Pablos-Mendez, Sarah Reddy, Susan Scrimshaw, Jaime Sepúlveda, David Serwint, Huda Tarabji*

**Executive summary**  
**Problem statement**  
100 years ago, a series of studies about the education of health professionals, led by the 1910 Flexner report, sparked groundbreaking reforms. Through integration of modern science into the curricula at university-based schools, the reforms equipped health professionals with the knowledge that contributed to the doubling of life span during the 20th century.

By the beginning of the 21st century, however, all is not well. Caring gaps and inequities in health persist both within and between countries, undermining our collective future to share the dramatic health advances equitably. At the same time, both health challenges loom. New infectious, zoonotic, and behavioral risks, at a time of rapid demographic and epidemiological transitions, threaten health security of all. Health systems worldwide are struggling to keep up, as they become more complex and competing additional demands on health workers.

Professional education has not kept pace with these challenges, largely because of fragmented, outdated, and static curricula that produce ill-equipped graduates. The problems are systemic: mismatch of competencies to patient and population needs; poor teamwork; persistent gender stratification of professional status; narrow technical focus without broader contextual understanding; episodic encounters rather than continuous care; predominant hospital orientation at the expense of primary care, quantitative and qualitative imbalance in the professional labour market; and weak leadership to improve health system performance. Laid-back efforts to address these deficiencies have mostly flourished, partly because of the so-called bubble of the professions—in, the tendency of siloed professions to act in isolation from or even in competition with each other.

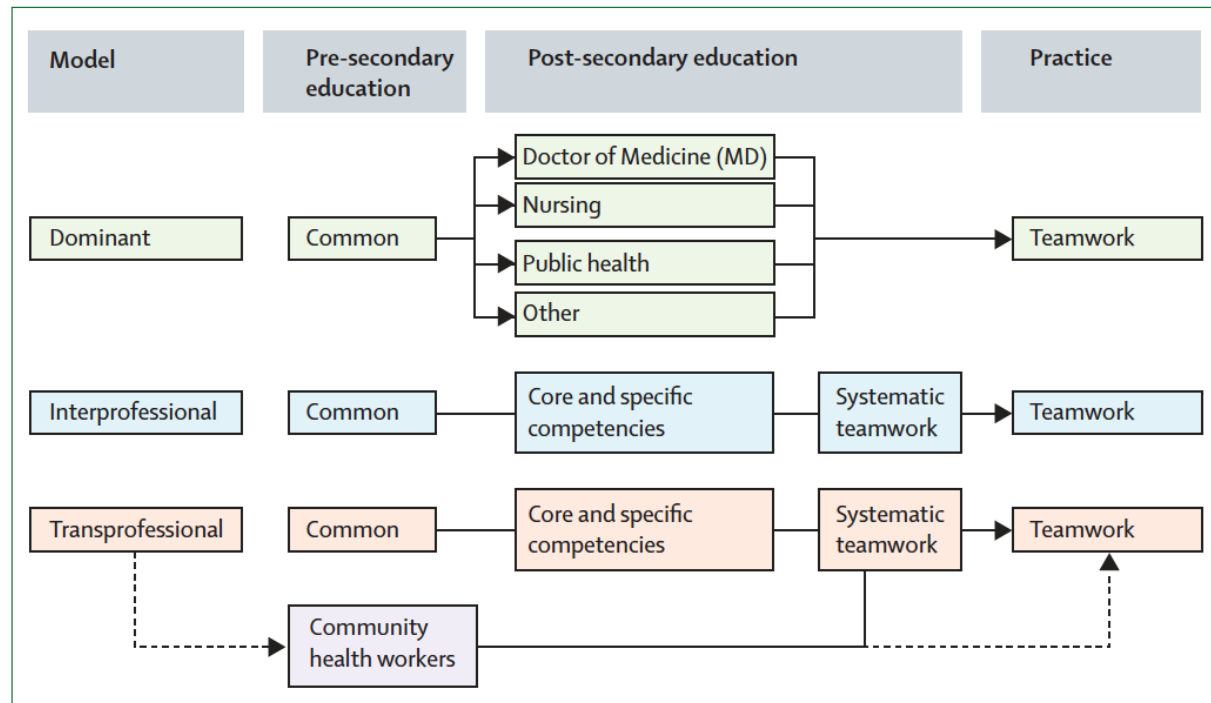
Redesign of professional health education is necessary and timely, in view of the opportunities for mutual learning and joint solutions offered by global interdependence due to acceleration of flow of knowledge, technologies, and financing across borders, and the integration of both professionals and patients. What is clearly needed is a thorough and authoritative re-examination of health professional education, matching the ambitious work of a century ago.

That is why this Commission, consisting of 20 professional and academic leaders from diverse countries, came together to develop a shared vision and a common strategy for postsecondary education in medicine, nursing, and public health that reaches beyond the confines of national borders and the silos of individual professions. The Commission adopted a global outlook, a multidisciplinary perspective, and a systems approach. This comprehensive framework considers the connections between education and health systems. It is rooted on people as co-producers and as drivers of needs and demands in both systems. By interaction through the labour market, the provision of educational services generates the supply of an educated workforce to meet the demand for professionals to work in the health system. To have a positive effect on health outcomes, the professional education sub-system must design new instructional and institutional strategies.

**Major findings**  
Worldwide, 2020 medical schools, 467 schools or departments of public health, and an indeterminate number of postsecondary nursing educational institutions train about 3 million new doctors, nurses, midwives, and public health professionals every year. The number of graduates is increasing rapidly, but the distribution, both between and within countries,

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See Comment page 1973  
and 1977  
\*Lead author  
Harvard School of Public Health, Boston, MA, USA  
†First author, China Medical Board, Cambridge, MA, USA  
†Second author, George Washington University, Washington, DC, USA  
†Third author, University of Washington, Seattle, WA, USA  
†Fourth author, Harvard School of Public Health, Boston, MA, USA  
†Fifth author, Harvard School of Public Health, Boston, MA, USA  
†Sixth author, Harvard School of Public Health, Boston, MA, USA  
†Seventh author, Harvard School of Public Health, Boston, MA, USA  
†Eighth author, Harvard School of Public Health, Boston, MA, USA  
†Ninth author, Harvard School of Public Health, Boston, MA, USA  
†Tenth author, Harvard School of Public Health, Boston, MA, USA  
†Eleventh author, Harvard School of Public Health, Boston, MA, USA  
†Twelfth author, Harvard School of Public Health, Boston, MA, USA  
†Thirteenth author, Harvard School of Public Health, Boston, MA, USA  
†Fourteenth author, Harvard School of Public Health, Boston, MA, USA  
†Fifteenth author, Harvard School of Public Health, Boston, MA, USA  
†Sixteenth author, Harvard School of Public Health, Boston, MA, USA  
†Seventeenth author, Harvard School of Public Health, Boston, MA, USA  
†Eighteenth author, Harvard School of Public Health, Boston, MA, USA  
†Nineteenth author, Harvard School of Public Health, Boston, MA, USA  
†Twentieth author, Harvard School of Public Health, Boston, MA, USA

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Lancet-report 2010  
(Frenk et al.)

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Dank voor uw aandacht

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