THE AGA KHAN UNIVERSITY

Incorporating Systems Thinking into Clinical Care

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Disclosures

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- No current financial disclosures

Existing Quality Gap

Condition	% of Recommended Care Received
Low back pain	68.5
Coronary artery disease	68.0
Hypertension	64.7
Depression	57.7
Orthopedic conditions	57.2
Colorectal cancer	53.9
Asthma	53.5
Benign prostatic hyperplasia	53.0
Hyperlipidemia	48.6
Diabetes mellitus	45.4
Headaches	45.2
Urinary tract infection	40.7
Hip fracture	22.8
Alcohol dependence	10.5

McGlynn EA, Asch SM, Adams J, et al., N Engl J Med, 2003

“To the individual who devotes his/her life to science, nothing can give more happiness than when the results immediately find practical application. There are not two sciences. There is science and the application of science, and these two are linked as the fruit is to the tree”

Louis Pasteur, 1871

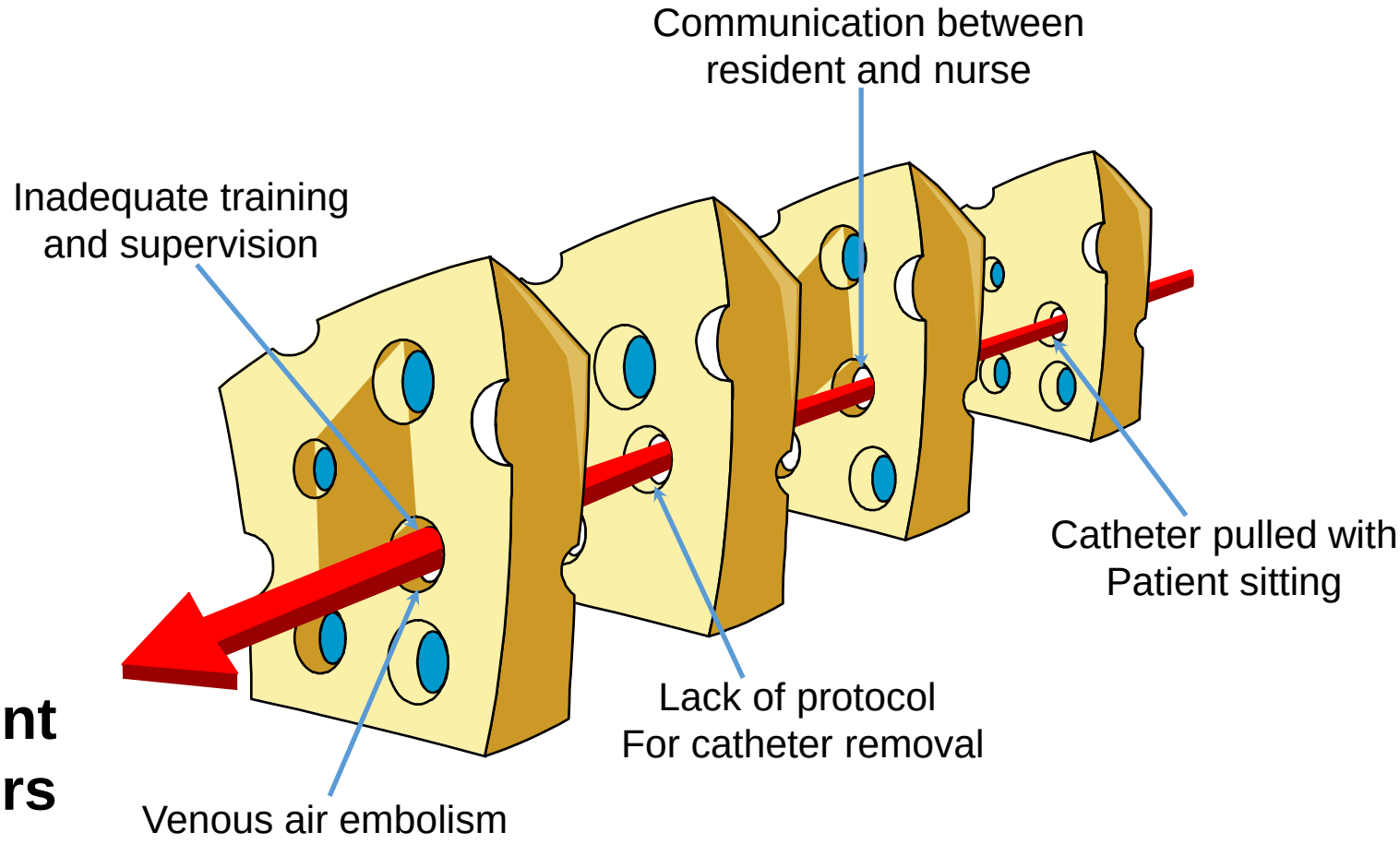
How Can These Gaps Happen?

- Reasons for variability in practice
  - Lack of multidisciplinary engagement
  - Confusion regarding practice
  - Workflow issues
  - Lack of required resources
  - Provider beliefs and practices

Need to view the delivery of healthcare as a science!

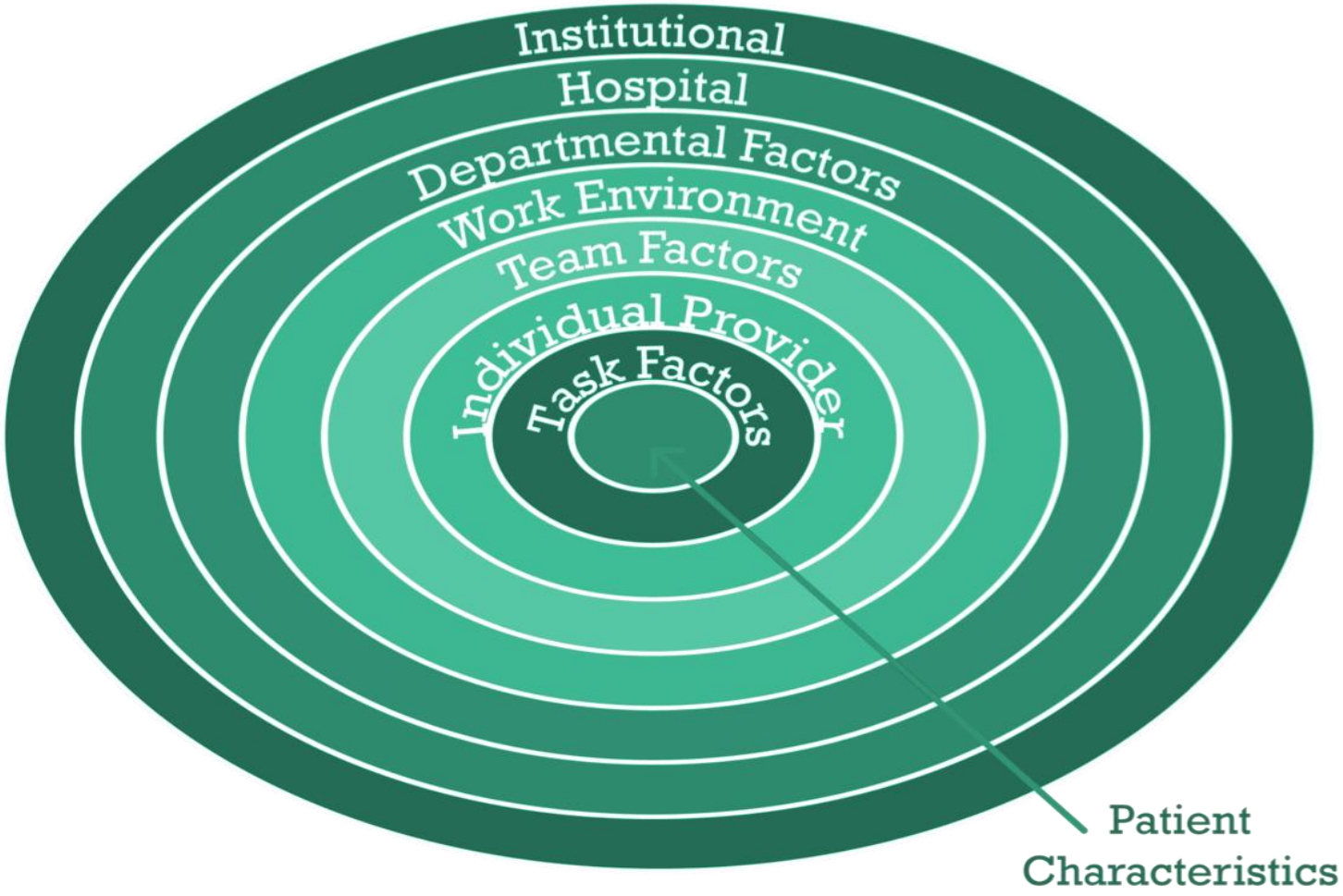
Treadwell JR, et al.. Surgical checklists: a systematic review of impacts and implementation. BMJ Qual Saf. 2014 Apr;23(4):299-318.
Borchard A, et al. A systematic review of the effectiveness, compliance, and critical factors for implementation of safety checklists in surgery. Ann Surg. 2012 Dec;256(6):925-33.
Sexton JB, et al. Error, stress, and teamwork in medicine and aviation: cross sectional surveys. BMJ. 2000 Mar 18;320(7237):745-9.

System Failure Leading to An Error



Pronovost PJ, Wu Aw, Sexton, JB et al., Ann Int Med, 2004
Reason J, Hobbs A, 2000

System Factors Impact Safety



Adopted from Vincent

“Rather than being the main instigators of an accident, operators tend to be the inheritors of system defects…Their part is that of adding the final garnish to a *lethal brew* that has been long in the cooking”

James Reason, *Human Error*, 1990

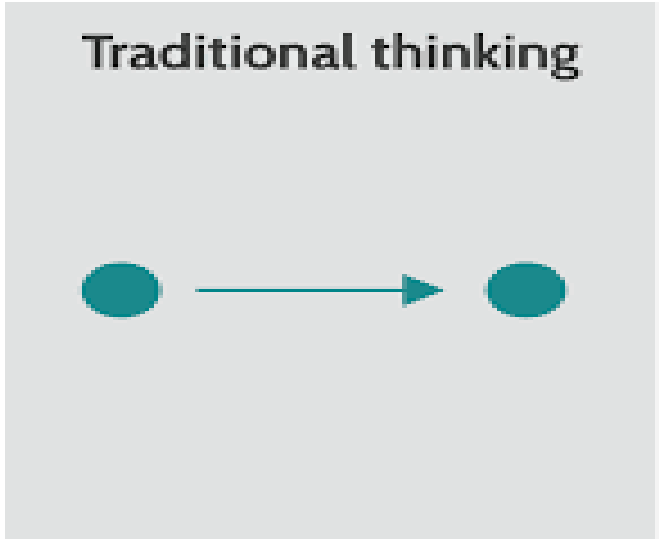
System-Level Factors Can Predict Performance

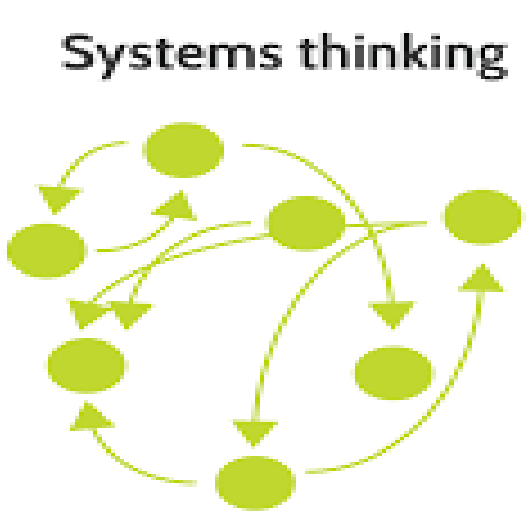
Examples of Impact of System-Level Factors	
System Factor	**Effect**
Daily rounds with an intensivist	When ICUs are staffed with a multidisciplinary team, including daily rounds with an intensivist, **mortality is reduced**
Nurses responsible for more than two patients	When nurses are responsible for more than two patients, there is an **increased risk of pulmonary complications** in the ICU patient population
Point-of-care pharmacist or pharmacist who participates in rounds	A point-of-care pharmacist or one who participates in rounds **reduces prescribing** errors

Systems Approach vs Systems Thinking

Quality

Systems Approach





How can we improve?

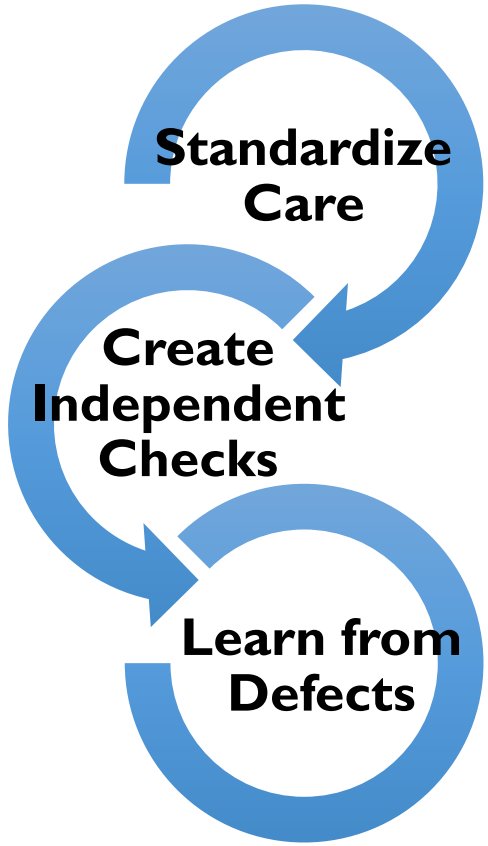
Understand that safety is a **science**

1. Accept we are fallible - assume things will go wrong rather than right
2. Every system is perfectly designed to achieve the results it gets
3. Understand principles of safe design - standardize, create checklists, learn when things go wrong
4. Recognize these principles apply to technical and team work
5. Teams make wise decision when there is diverse and independent input

Caregivers are largely not to blame!

Principles of Safe Design

- Standardize care
- Create independent checks
- Learn when things go wrong



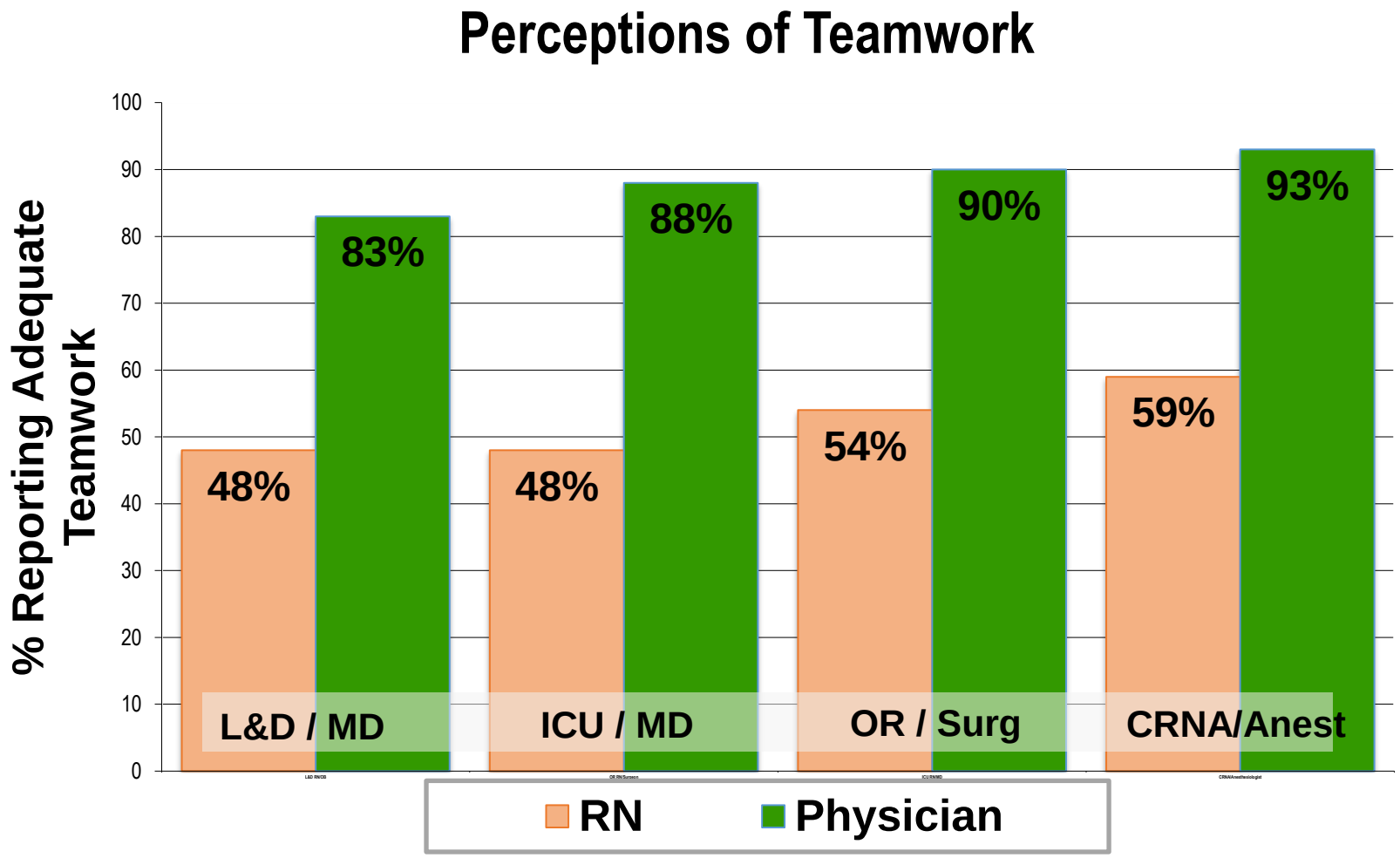
Principles apply to both technical tasks and adaptive teamwork issues.

Health Services Research, 2006
Circulation 2009;119:330-337

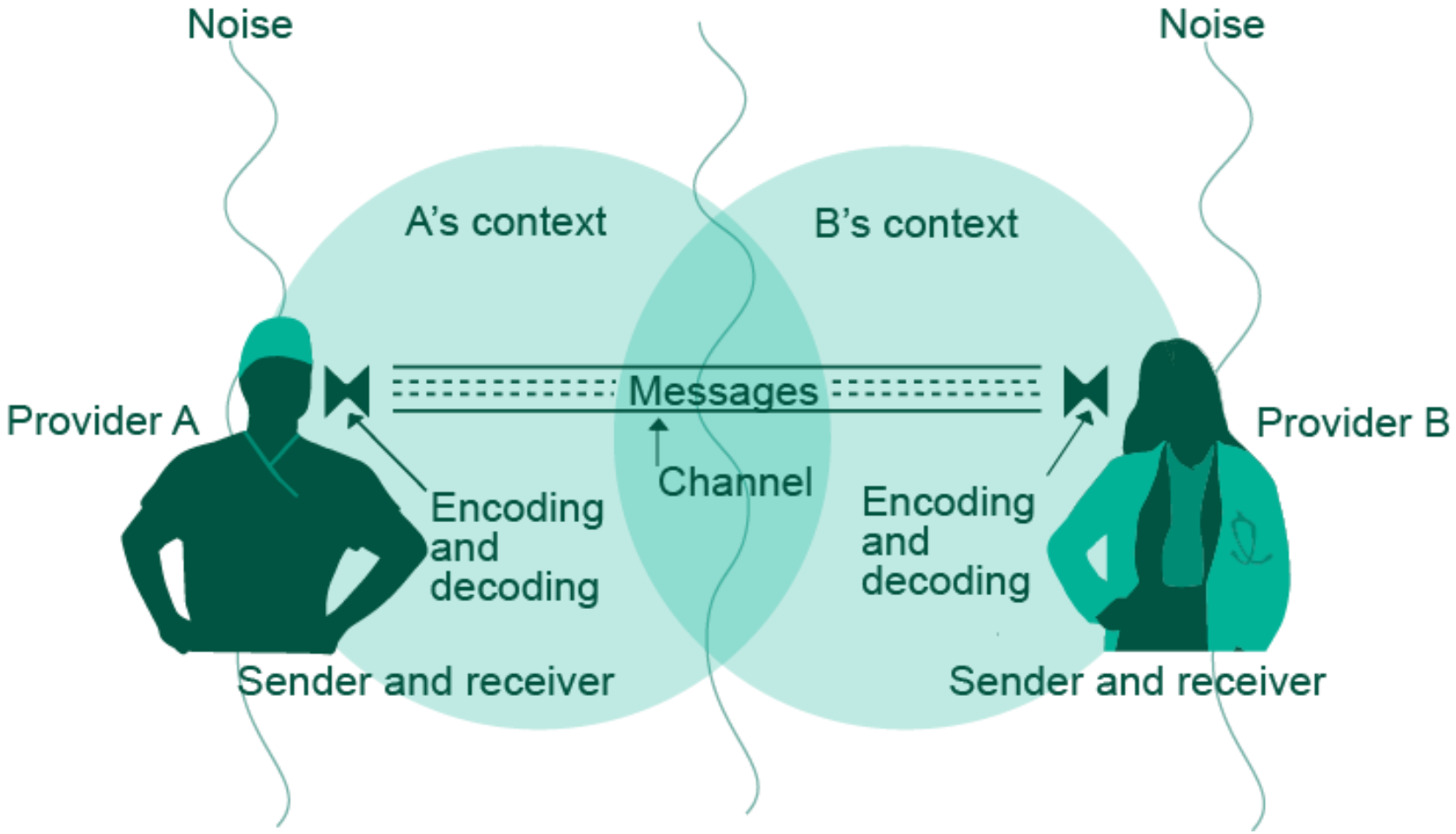
Applying System Thinking to Practice

Principles of Safe Design apply to technical and teamwork as well

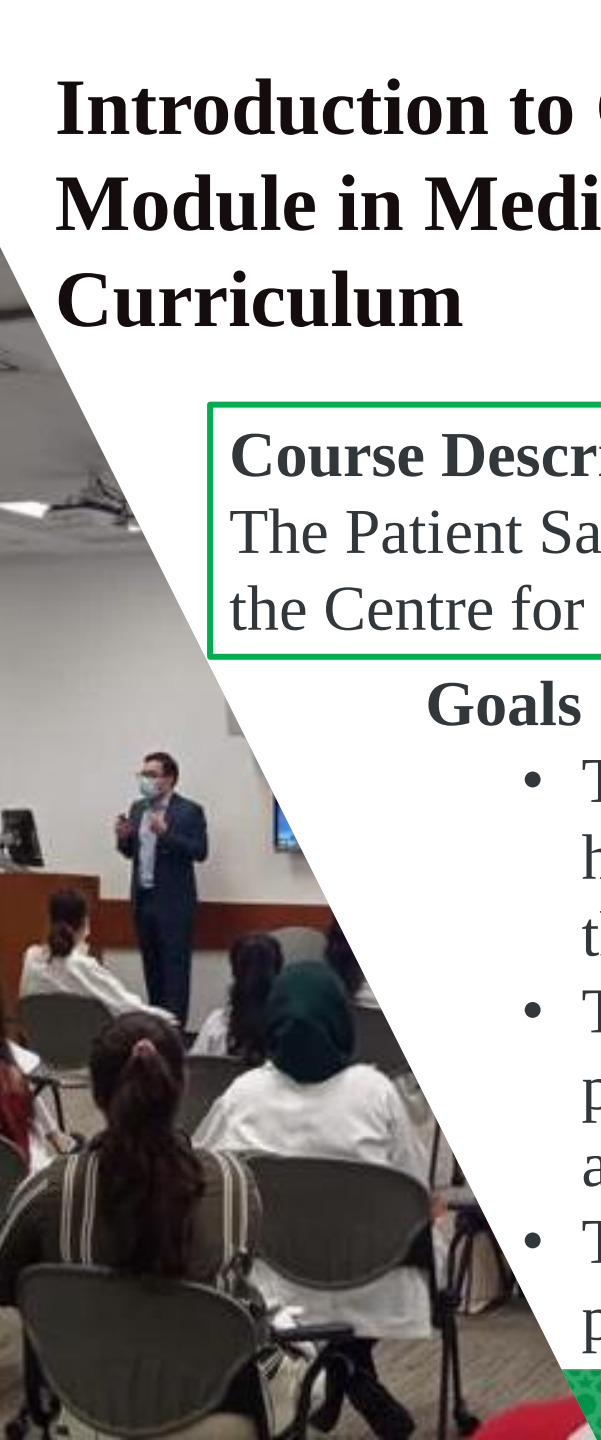
Teamwork Disconnect

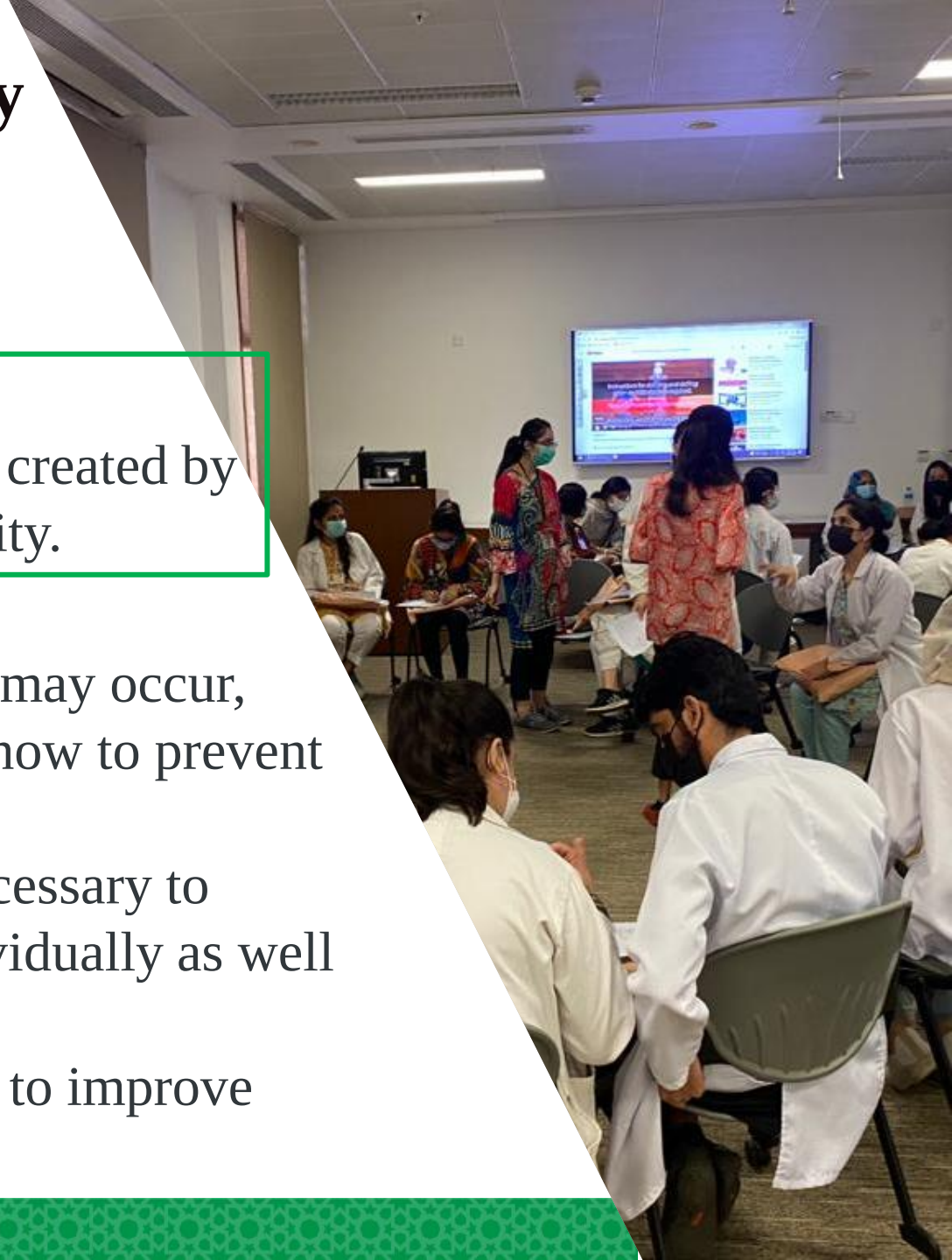


Basic Components and Process of Communication



Introduction to Quality and Patient Safety Module in Medicine and Nursing Curriculum





Course Description

The Patient Safety Course is a five-day program created by the Centre for Patient Safety, Aga Khan University.

Goals

- To understand how medical errors may occur, how we can learn from them, and how to prevent their recurrence
- To obtain knowledge and skills necessary to practice medicine safely both individually as well as within teams
- To improve system-based thinking to improve patient safety and quality of care.

- Improved the knowledge of healthcare providers in Patient Safety and Quality Improvement

M.B, B.S Students	Knowledge Assessment (Pre and Post)	Systems Thinking Scale (Pre and Post)	Knowledge Efficacy
Class of 2023 (Year 3)	+22.12%, p<0.001	+4.16%, p=0.018	Uniform increase, p<0.001
Class of 2024 (Year 3)	+ 37.71%, p=0.000	+5.49%, p=0.010	Uniform increase, p<0.001
BScN Students	**Knowledge Assessment (Pre and Post)**	**Systems Thinking Scale (Pre and Post)**	**Knowledge Efficacy**
Class of 2021 (Year 4)	+26.53%, p=0.000	+8.54%, p=0.000	Uniform increase, p=0.000
Class of 2023 (Year 2)	+35.79%, p=0.000	+11.14%, p=0.000	Uniform increase, p=0.012
Class of 2024 (Year 2)	+22.96%, p=0.000	+8.94%, p=0.000	Uniform increase, p=0.000

Recap

- Every system is designed to achieve its anticipated results
  - Develop lenses to see systems
- The principles of safe design are:
  - standardize when you can,
  - create independent checks, and
  - learn from defects
- Infuse principles of standardization and independent checks in your processes
- The principles of safe design apply to technical work and teamwork

Thank you