Inter-Professional Team Training to Improve Non-Technical Skills – A Successful Story from our Learning Laboratory

Roy Phitayakorn, MD MHPE (MEd) FACS
The Massachusetts General Hospital
Harvard Medical School

MY EXPERIENCE IN MEDICAL EDUCATION

- 50% clinical practice in general surgery and endocrine
  - Take general surgery call
- Education consultant to Program Directors for the Partners GME Office for 3 years
- Surgical Lead for the MGH Learning Lab for 4 years
- Director of Medical Student Education and Surgical Education Research
- Chair of the HMS Surgery Clerkship Committee
- Education technology consultant for the NEJM (50% FTE)
- Teach at all levels (UGME, GME, CME)

LEARNING OBJECTIVES

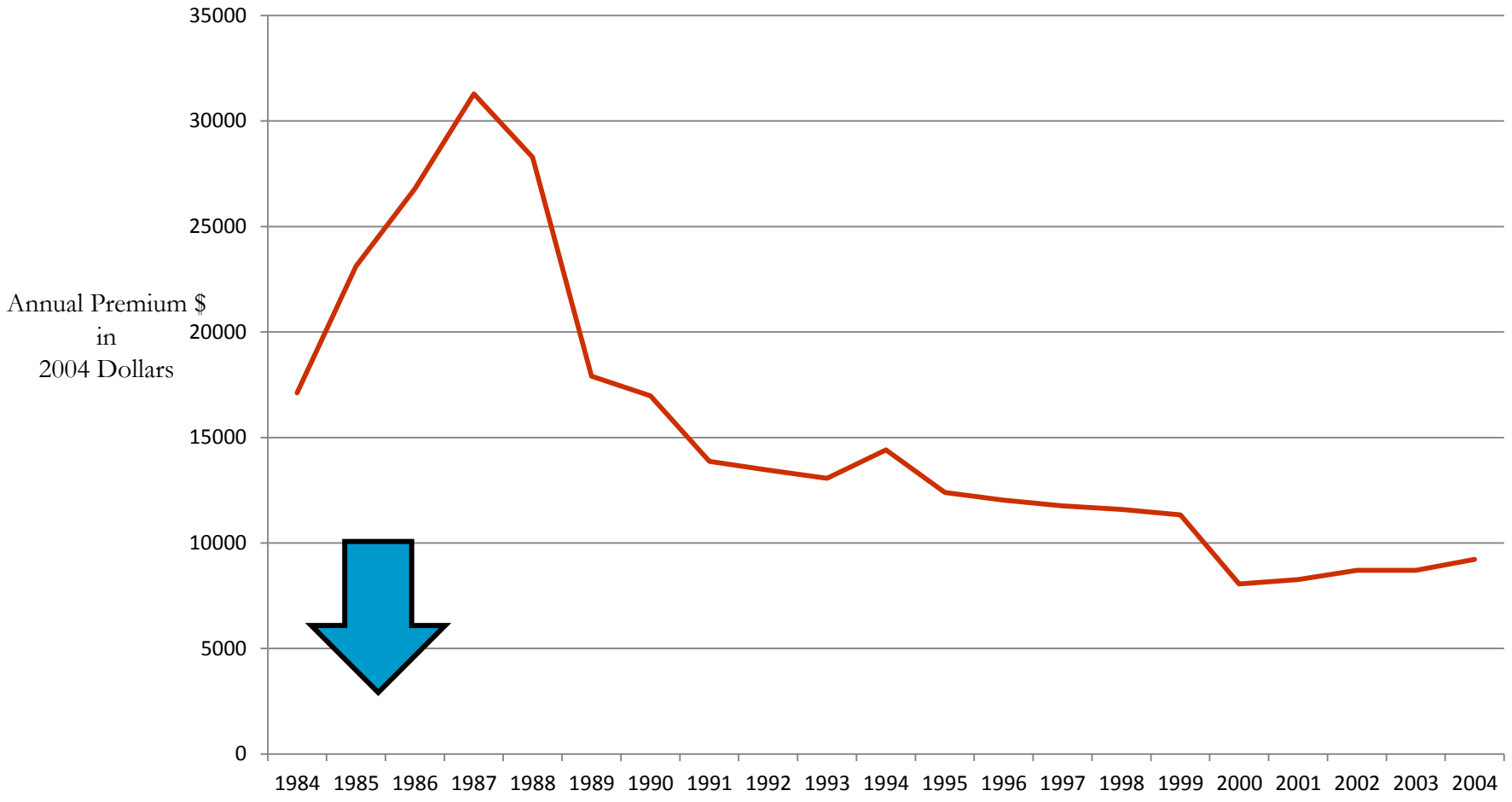
- Discuss the rationale for inter-professional operating room team training for non-technical skills
- Explain how we created our OR team training program
- Debate special considerations from our program
- Review results of the program so far
- Hypothesize next steps for future work

RATIONALE FOR TEAM TRAINING

- Medical errors resulting in *preventable* patient harm are caused by:
  - Technical errors
  - Communication breakdowns and lapses in teamwork
- ASA/ACS closed claims studies show *poor communication* to be significant cause of preventable adverse events

JUST THE TIP OF THE ICEBERG…

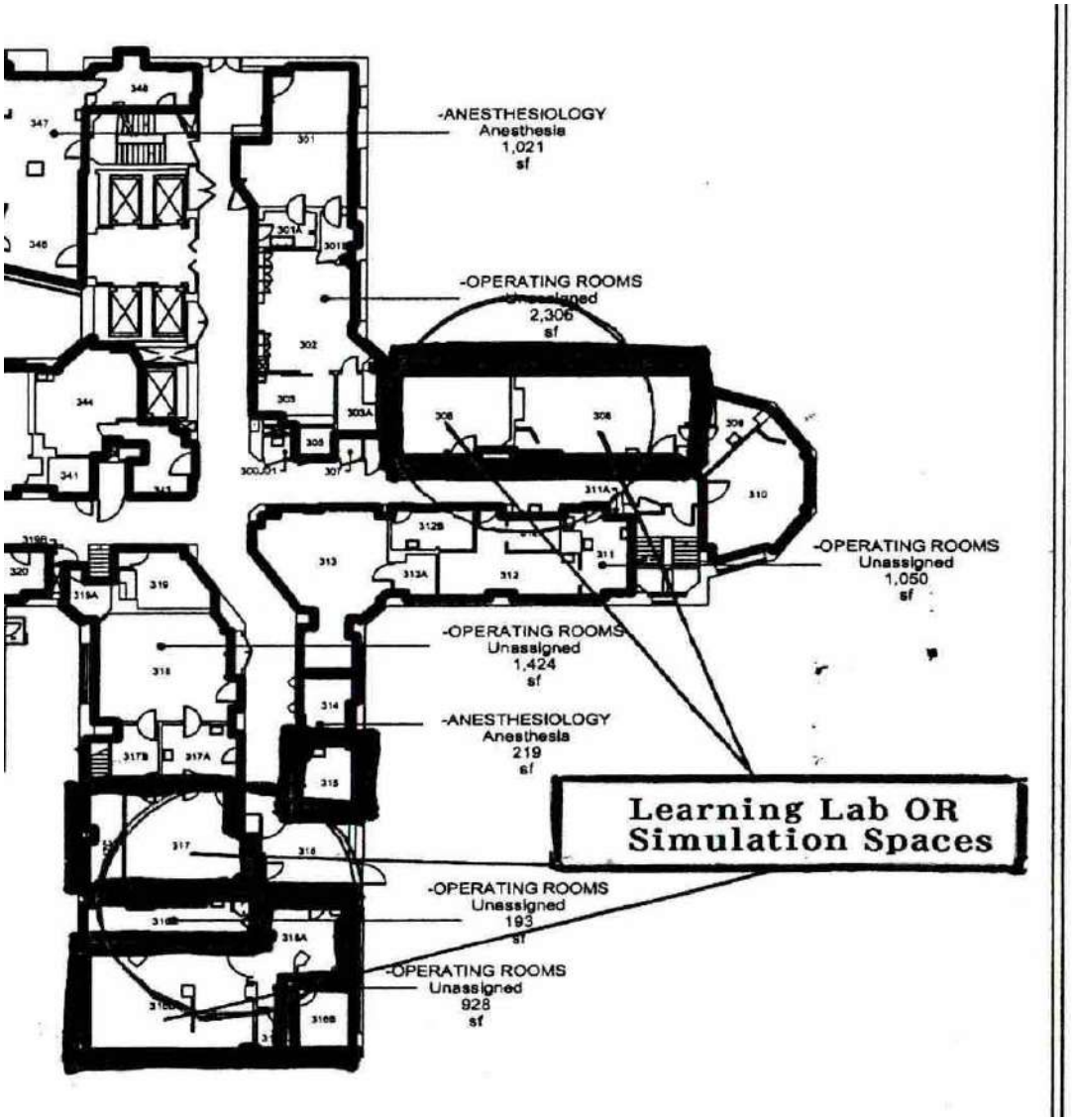
Anesthesia: A Safety Story in Premium History

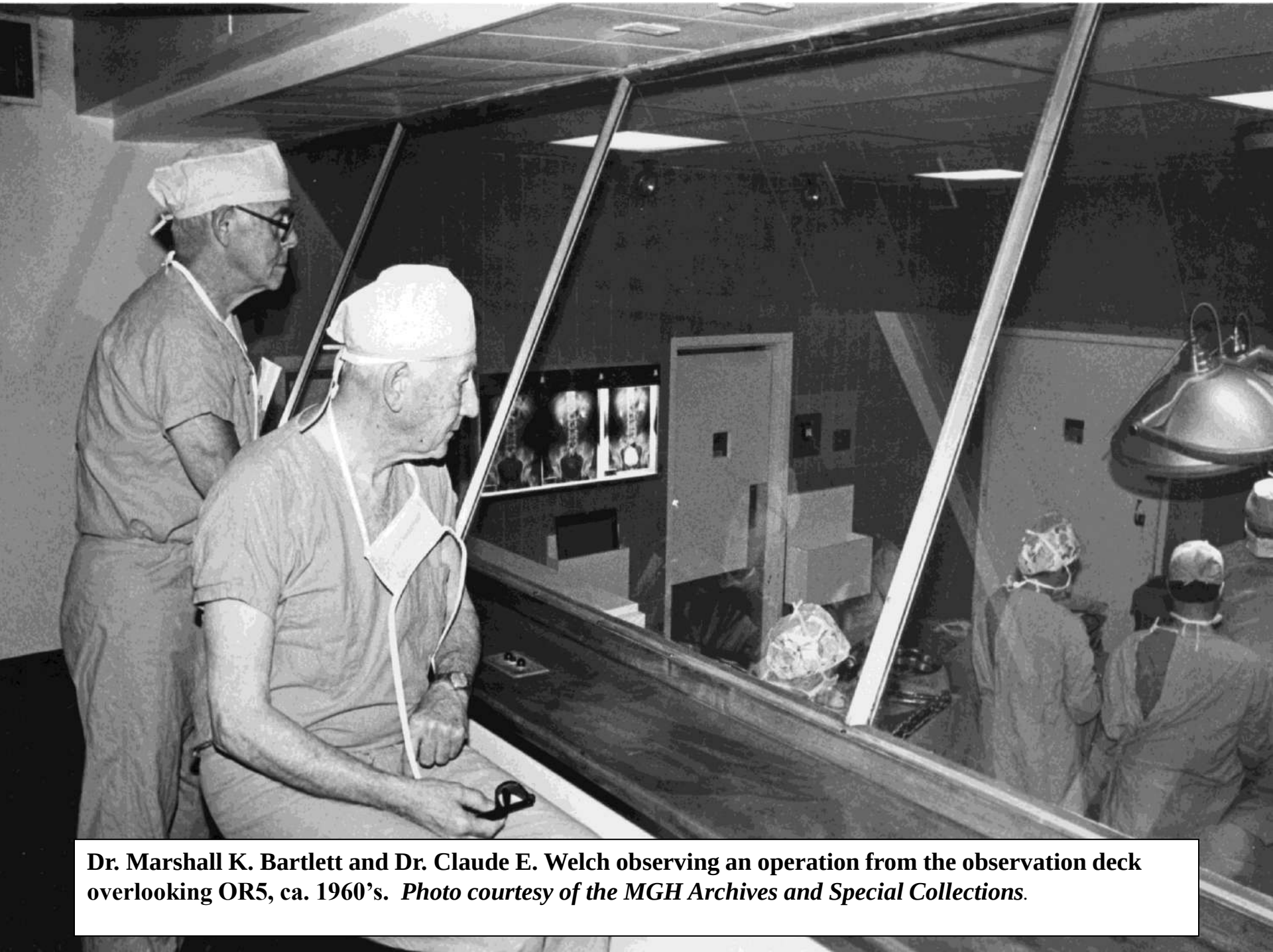


NEW OR TEAM TRAINING SIMULATION PROGRAM

- Joint program between Learning Lab, Perioperative Services, Knight Nursing Simulation Group, MGH Departments of Anesthesia and Surgery
- In-situ training program
  - Convenience for cost and location
- Faculty, nurse, and resident program
  - Faculty = 6 hours twice a month / once a year
  - Resident = 2 hours a week / three times a year
  - Nurses = Either group

MGH Simulation-OR Suites (Pilot Program)





Dr. Marshall K. Bartlett and Dr. Claude E. Welch observing an operation from the observation deck overlooking OR5, ca. 1960's. ***Photo courtesy of the MGH Archives and Special Collections.***

Massachusetts General Hospital
Learning Laboratory

Invites you to Attend the

Reopening of the Historic Surgical Observation Deck

Dedicated to OR Simulation Training

on Thursday, the 25th of April

at Four o'clock

Bigelow Ampitheater,

White Building, Fourth Floor

R.S.V.P. to:

mghsimulation@partners.org

MASSACHUSETTS GENERAL HOSPITAL

Miltidisciplinary High Fidelity Operating Room Simulation Training

Learning Laboratory Simulation Center

SPECIAL CONSIDERATIONS!

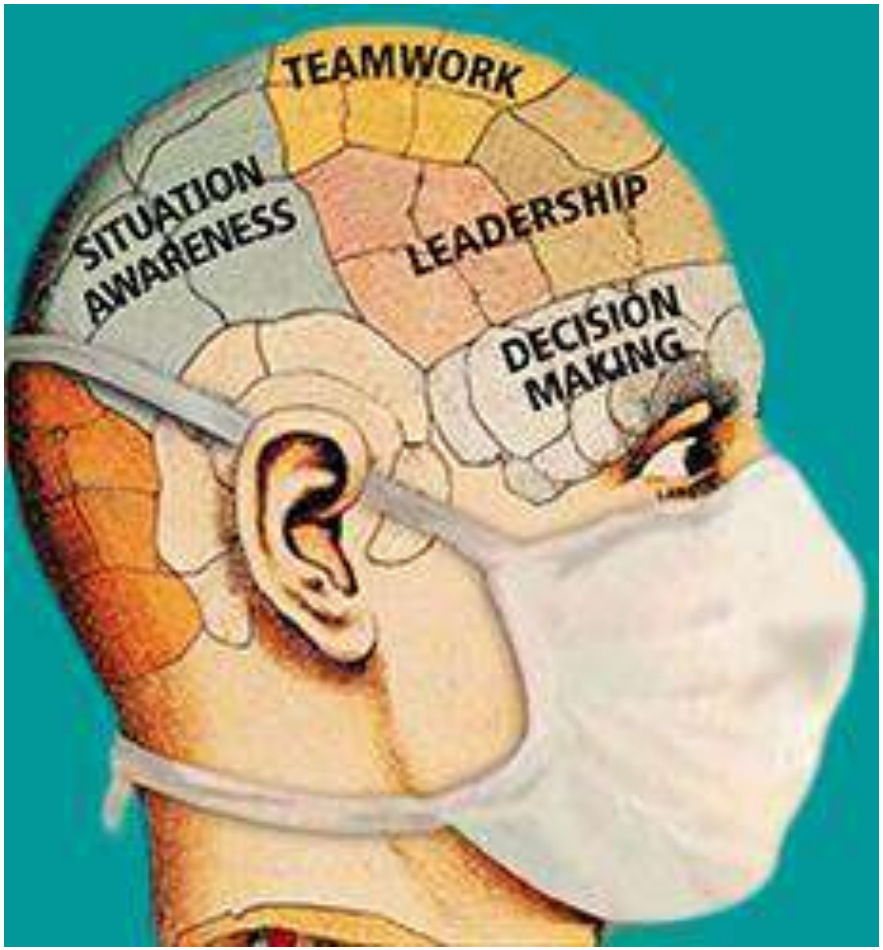
1. Which surgical specialties to focus on?
2. Which non-technical skills to focus on?
3. How to create a realistic OR scenario?
   a) Are there any inter-professional issues?
4. New patient safety challenges?

SURGICAL SPECIALTIES

SPECIALTY	TOTAL NUMBER OF ATTENDING PHYSICIANS
Cardiac Surgery	35
General Surgery	162
Gynecology Surgery	68
Neurosurgery	41
Orthopedic Surgery	186
Otolaryngologists	82
Thoracic Surgery	27
TOTAL	601

WHICH NON-TECHNICAL SKILLS TO FOCUS ON???

- TEAMWORK
  - Low budget
  - Surveyed stakeholders
    - Use of World Health Organization OR checklist
    - Role clarity
    - Early mobilization of resources
  - Reviewed claims
    - Practice speaking up
    - Closed loop communication



HOW TO CREATE A REALISTIC OR TEAM TRAINING SCENARIO

- Need an inter-professional scenario development team
- Need new methods to set-up and run scenarios
- Must be prepared for a real emergency

INTER-PROFESSIONAL SCENARIO DEVELOPMENT TEAM










INTER-PROFESSIONAL ISSUES

- Different levels of experience/clinical specialties
- All must feel involved and have a role in the scenario
- Trust and confidentiality
  - How to handle feedback

HOW TO CREATE A REALISTIC OR TEAM TRAINING SCENARIO

- Need an inter-professional scenario development team
- Need new methods to set-up and run scenarios
- Must be prepared for a real emergency

Pre-scenario huddle with checklist
New models
Dress rehearsals
Suspension of disbelief

Pre-Simulation Huddle

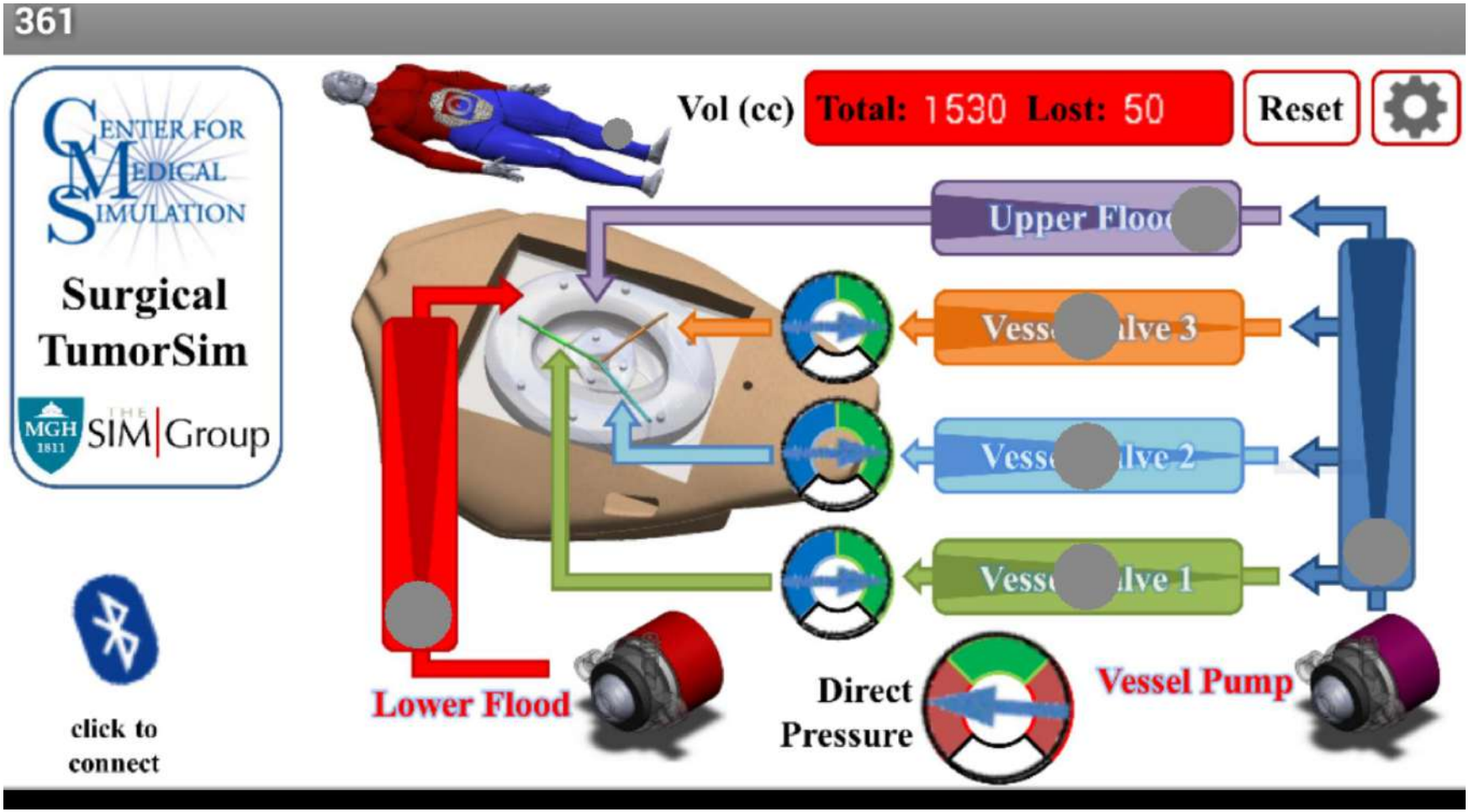
Massachusetts General Hospital

Massachusetts General Hospital Learning Laboratory

Harvard Medical School

NEW MODELS

TABLET CONTROLS



DRESS REHEARSALS

- Need at least two dress rehearsals
  - Pick trainees who are friendly to simulation

SUSPENSION OF DISBELIEF

- Must accelerate time
  - Start in middle or end of the operation
- Everyone must understand who they are and what they are doing

HOW TO CREATE A REALISTIC OR TEAM TRAINING SCENARIO

- Need an inter-professional scenario development team
- Need new methods to set-up and run scenarios
- Must be prepared for a real emergency!!!

"This is a real world event!
This is NOT part of the simulation!"

REAL PATIENT SAFETY ISSUES

- Risks and benefits of real versus simulated
  - Drugs / medications
  - OR equipment
- Location / Logistic issues
  - Calling/getting help from outside simulation OR
  - Non-clinical simulation participants in simulation space
  - Moving simulated patients and simulation participants
- Latent organizational issues
- Need a clear policies and procedures manual!

RESULTS SO FAR…

FACULTY PROGRAM

- Total of **435** participants:
  - 140 anesthesiologists
  - 145 surgeons
  - 80 nurses
  - 70 surgical technicians

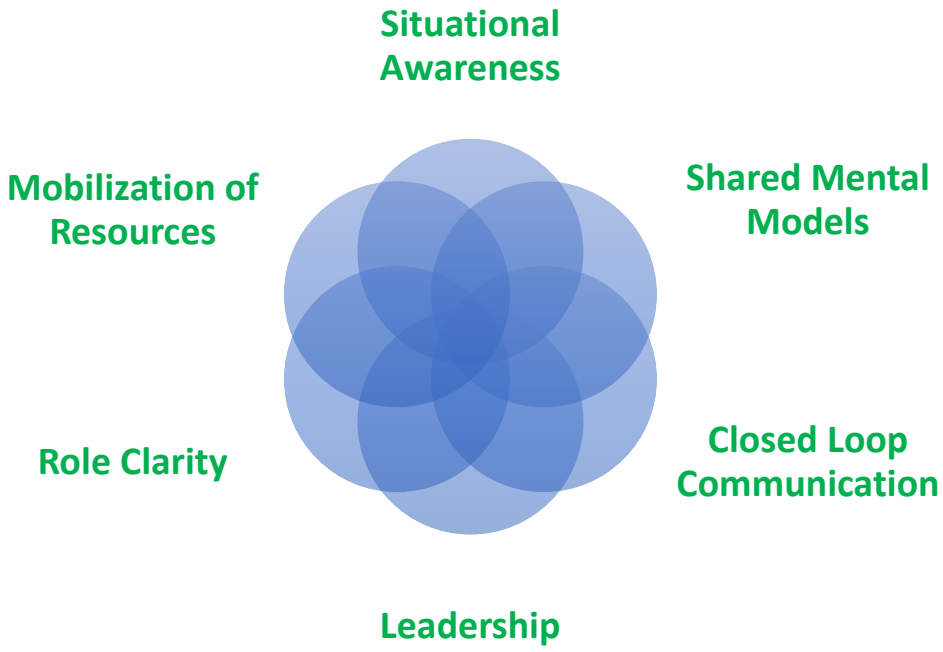
RESIDENT PROGRAM

- Total of **578** participants:
  - 197 anesthesiology residents
  - 166 surgical residents
  - 142 nurses
  - 73 surgical technicians

KEYS TO INTER-PROFESSIONAL OR TEAM TRAINING PROGRAM

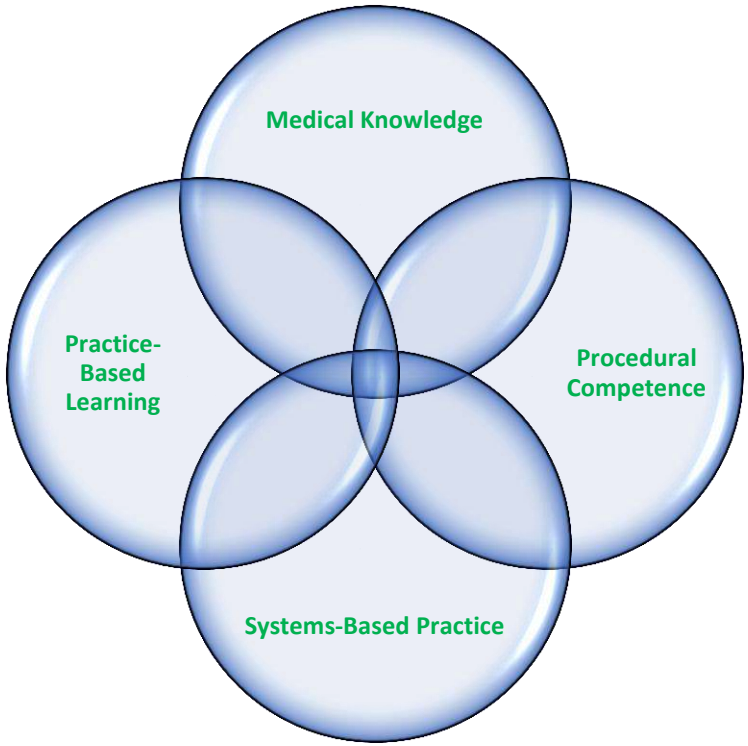
- Multidisciplinary training with *full* OR team
- Regular, recurring basis
- High fidelity models
- Realistic simulation operating room, does NOT have to be in-situ
- Faculty *and* resident program

CONSTANT BALANCE!



BEHAVIORAL SKILLS

CLINICAL SKILLS



WHAT'S NEXT IN THE STORY???

- Moved to more humble simulated operating room
- Field observations of intraoperative performance
- Patient outcome data
- Trends in malpractice claims
- Expanding usage of team training
  - Medical and nursing students
  - Robotic cases
  - Other OR processes that require team practice
    - Sterilization of instruments

TAKE-HOME POINTS

1. It takes a village
2. Safety in and outside simulation OR is Priority #1
3. In-situ environment enhances convenience, typical behavior, and transfer, but is expensive
4. Inter-professional scenarios should be inter-professional
5. Debrief is as important if not more important within inter-professional teams
6. Institutional support, administration, and cooperation necessary

QUESTIONS???

HOW TO ASSESS NON-TECHNICAL SKILLS USING SIMULATION???

PRAELADA WONGSIRIMETEEKUL, MD
ROY PHITAYAKORN, MD MHPE (MEd)

PRAELADA WONGSIRIMETEEKUL, MD

- Prince Mahidol Youth Award Scholar 2015
- Surgical Education and Simulation Research Fellow, Massachusetts General Hospital, USA (2017)
- NEJM Medical Education Research Fellow (2017)
- First year Ophthalmology resident, Faculty of Medicine, Chiang Mai University

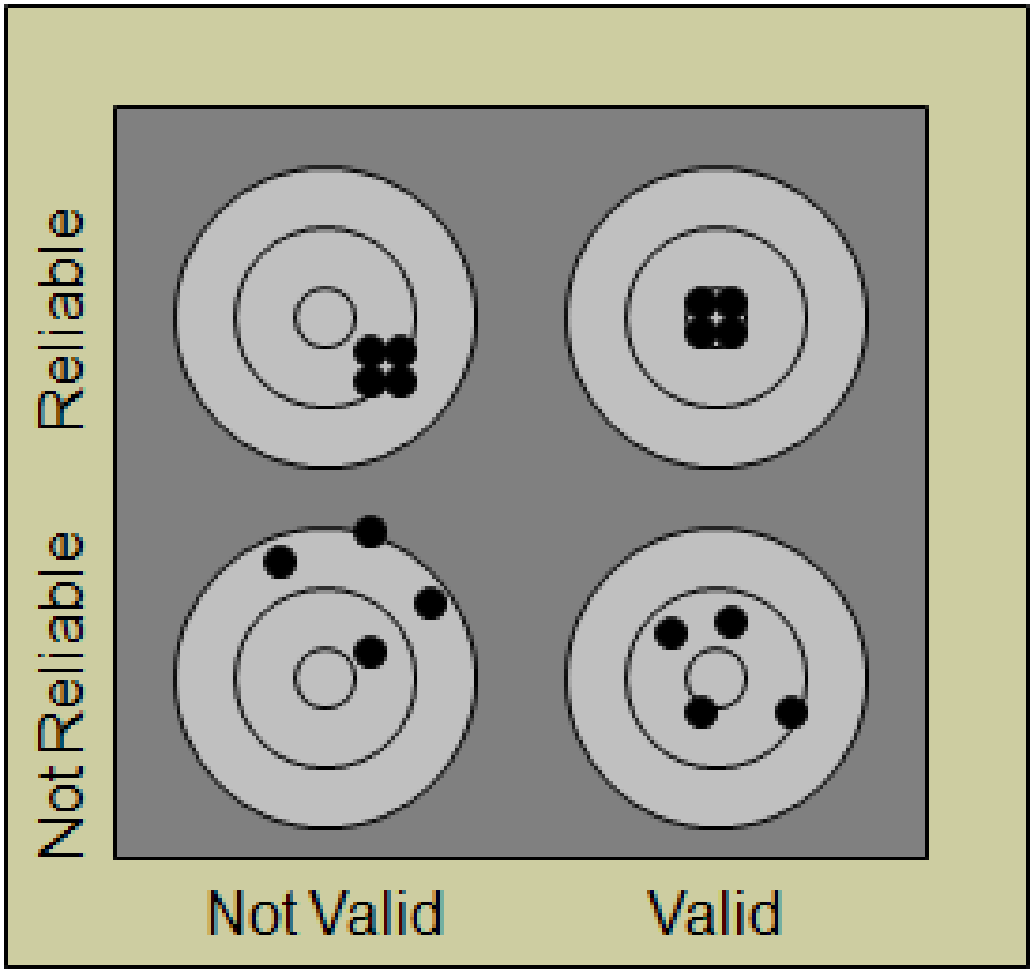
LEARNING OBJECTIVES

- Review the rationale for assessment of non-technical skills using simulation
- Discuss how assessment of technical and non-technical skills are similar and different
- Discuss the different types of assessment instruments
- Debate the future of non-technical skills assessment

SO WHAT IS ASSESSMENT???

"To determine the rate or amount of something through careful observation and/or appraisal."

IMPORTANT CONCEPTS FOR TECHNICAL SKILLS ASSESSMENT



WHAT ABOUT NON-TECHNICAL SKILLS???

- Professionalism
- Clinical organization/prioritization
- Leadership
- Communication
- Situational awareness
- Teamwork

WHY IS ASSESSMENT OF NON-TECHNICAL SKILLS IMPORTANT???

- Research is clear that non-technical skills are associated with:
  - Improved patient outcomes
  - Improved patient satisfaction
  - Improved health-care provider satisfaction
  - Decreased physician burnout
  - Decreased medical errors

IMPORTANT CONCEPTS FOR NON-TECHNICAL SKILLS ASSESSMENT

- What is the purpose of the assessment?
- Which assessment instrument to use?
  - Needs to be practical and cost-effective
  - Need to practice using the instrument!

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journal homepage: www.JournalofSurgicalResearch.com

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Practicality of intraoperative teamwork assessments

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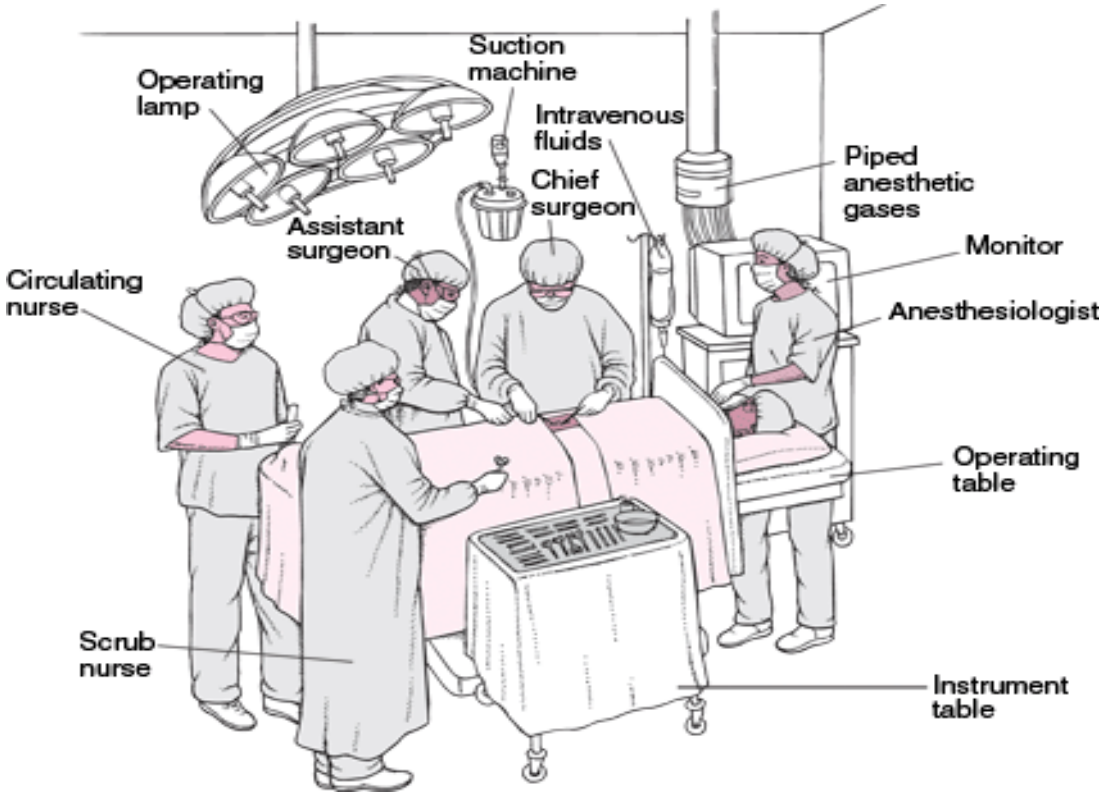
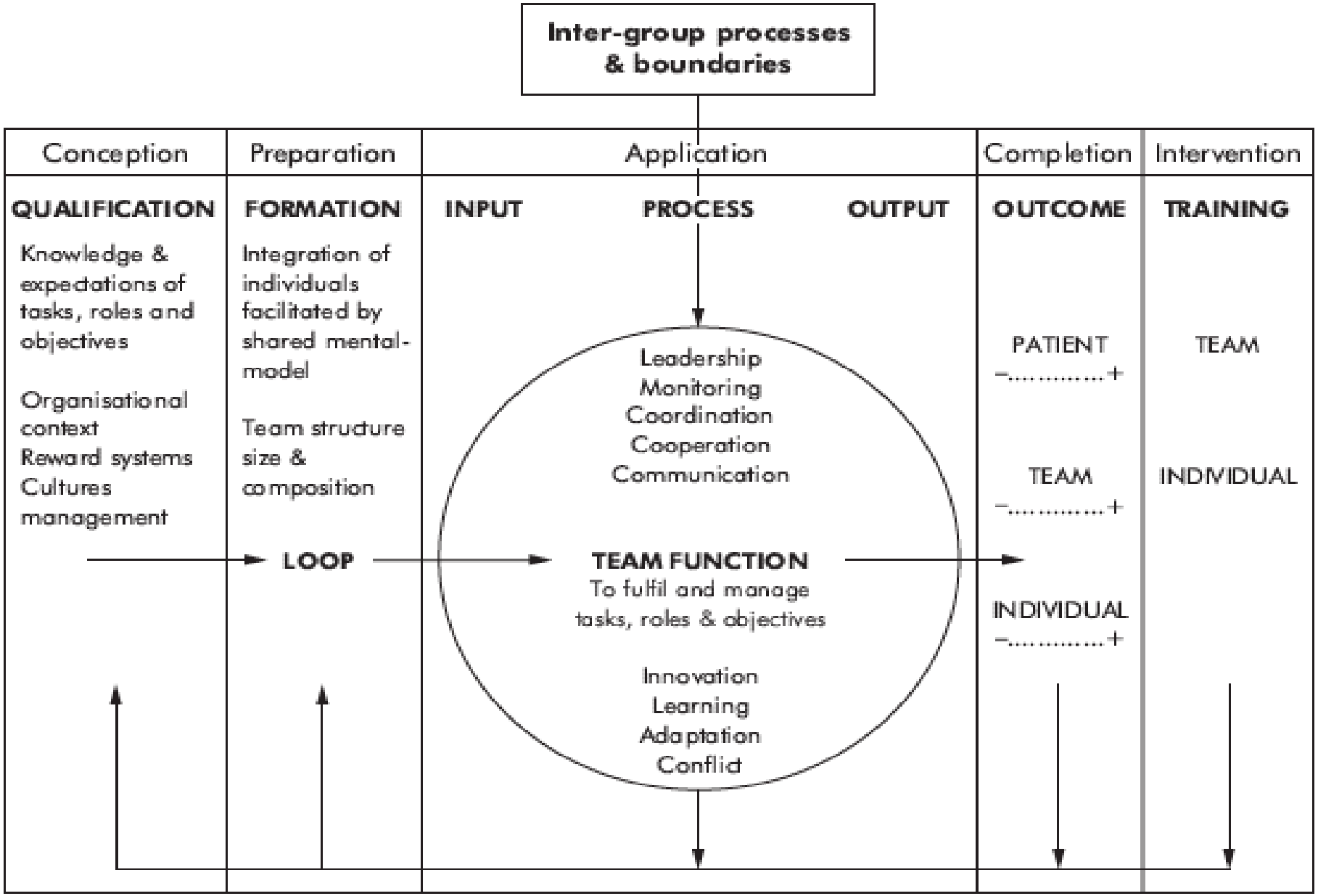
OPERATING ROOM TEAMWORK

- Three primary components of the OR team
  - Anesthesiologists
  - Nurses / Scrub Technicians
  - Surgeons




Inter-group processes & boundaries
Conception
Preparation
Application
Completion
Intervention
QUALIFICATION
FORMATION
INPUT
PROCESS
OUTPUT
OUTCOME
TRAINING
Knowledge & expectations of tasks, roles and objectives
Organisational context
Reward systems
Cultures
management
Integration of individuals facilitated by shared mental-model
Team structure
size &
composition
Leadership
Monitoring
Coordination
Cooperation
Communication
PATIENT
TEAM
TEAM
INDIVIDUAL
INDIVIDUAL
LOOP
TEAM FUNCTION
To fulfil and manage tasks, roles & objectives
Innovation
Learning
Adaptation
Conflict

Training Tool Identified	Number of Studies (*n*)	Outcomes
NOTSS (Non-Technical Skills for Surgeons)[6,16,34-42,71-74,87-90]	19	Experts more skilled in its use[6,35] Good interrater agreement/ reliability[34,37,39,71] Good rating accuracy[36] Acceptable sensitivity[36] Validity recognised[6,34-38]
Training course/program/curriculum[41,48,50-56,75-78,81,84-86]	17	Multiple outcomes depending on program/course curriculum[41,48,50-56,75-78,81,84-86]
Oxford NOTECHS[11-16,52,91,92]	9	Excellent interrater reliability[13,14] Validity achieved[13]
OTAS (Observational Teamwork Assessment for Surgery)[14,21,25-27,34,74,79]	8	Interrater reliability high[21,26] Content validity good[21]
Simulation-Based Training[49,52,56,80,89]	5	Multiple outcomes based on type of simulation
Oxford NOTECHS II[17-20]	4	Construct and face validity achieved[18] Good interrater reliability[18]
NOTSSdk[31-33] (Non-Technical Skills for Surgeons in Denmark)	3	Content validity achieved[33] Interrater reliability achieved[33] Good internal consistency[31]
Global summary scores[43,47] or checklists[83]	3	Differences found between self- and expert assessment[43,47]
SLI/Surgeon's Leadership Inventory[66-68]	3	High interrater reliability[66,68]
OTAS-S (Observational Teamwork Assessment for Surgery—Spanish)[22,23]	2	High interrater reliability[22] Content validity achieved[22]
OTAS-D (Observational Teamwork Assessment for Surgery—Deutsch)[24]	1	High interrater reliability[24]
OSANTS (Objective Structured Assessment of Nontechnical Skills)[87]	1	Good interrater agreement[87]
(METEOR)[46] (Metric for Evaluating Task Execution in the Operating Room)	1	Validity implied, variable content validity[46]
360-degree evaluation tool[44]	1	Questionnaire: 63% of participants changed nontechnical practices[44]
BMS-NNTS[45] (Behavioural Marker System for Assessing Neurosurgical Non-Technical Skills)	1	Good interrater reliability[45] High sensitivity[45]
Canon-Bowers[73]	1	Good correlation with NOTSS[73]
Surgical teamwork tool[29]	1	Good interrater reliability[29]
Teamwork scale[53]	1	No reliability or validity information reported
Cognitive skills trainer[59]	1	No reliability or validity information reported
SDMRS[65] (Surgical Decision-Making Rating Scale)	1	Reliability achieved[65] Consistent for expert or self-assessment[65]
RATE tool[70] (Remote Analysis of Team Environment tool)	1	No reliability or validity information reported
MLQ[66] (Multifactor Leadership Questionnaire)	1	High interrater reliability[66]

Wood et al., J Surg Ed 74:548-578

Anesthesiologists' Non-Technical Skills (ANTS)

Category	Element	Poor	Marginal	Acceptable	Good	Comments
Task Management	Planning & preparing					
	Prioritizing					
	Providing & maintaining standards					
	Identifying & utilizing resources					
Team Working	Coordinating activities with team					
	Exchanging information					
	Using authority & assertiveness					
	Assessing capabilities					
Situation Awareness	Supporting others					
	Gathering information					
	Recognizing & understanding					
	Anticipating					
Decision Making	Identifying options					
	Balancing risks & selecting options					
	Re-evaluating					

Scrub Practitioners' Intra-operative Non-Technical Skills (SPLINTS)

	Poor	Marginal	Acceptable	Good	Comments
Situational awareness					
Gathering information					
Recognizing and understanding information					
Anticipating					
Communication and Teamwork					
Acting assertively					
Exchanging information					
Coordinating with others					
Task management					
Planning and preparing					
Providing and maintaining standards					
Coping with pressure					

Non-Technical Skills for Surgeons (NOTSS)

	Poor	Marginal	Acceptable	Good	Comments
SITUATIONAL AWARENESS					
Gathering information					
Understanding information					
Projecting & anticipating future state					
DECISION-MAKING					
Considering options					
Selecting and communicating options					
Implementing and reviewing decisions					
LEADERSHIP					
Setting and maintaining standards					
Supporting others					
Coping with pressure					
COMMUNICATION & TEAMWORK					
Exchanging information					
Establishing a shared understanding					
Coordinating team					

RATING DEFINITIONS

Rating Label	Description
4 – Good	Performance was of a consistently high standard, enhancing patient safety; it could be used as a positive example for others
3 – Acceptable	Performance was of a satisfactory standard but could be improved
2 – Marginal	Performance indicated cause for concern, considerable improvement is needed
1 – Poor	Performance endangered or potentially endangered patient safety, serious remediation is required
N – Not observed	Skill could not be observed in this situation

Observational Teamwork Assessment for Surgery (OTAS-m)

	Problematic behavior – team function severely hindered	Team function compromised through lack of/inadequate behavior	Slight detriment to team function	Team function neither hindered nor enhanced	Behavior enhances moderately team function	Behavior enhances highly effective team function	Exemplary behavior very highly effective in enhancing team function	Comments
Communication (quantity and quality)								
Coordination: (management & timing of activities & events)								
Cooperation: (back-up among team members for support and error correction)								
Leadership (give directions, assertiveness & support of team members)								
Team monitoring & Situational awareness: (awareness of on-going processes)								

TIME TO GIVE IT A TRY!!!

NEXT STEPS!!!

The relationship between intraoperative teamwork and management skills in patient care

Roy Phitayakorn, MD, MHPE, FACS,[a,b] Rebecca D. Minehart, MD,[b,c] Maureen W. Hemingway, RN, MHA, CNOR,[b,d] May C. M. Pian-Smith, MD,[b,c] *and* Emil Petrusa, PhD,[a,b] *Boston, MA*

Surg Today (2016) 46:1451–1455
DOI 10.1007/s00595-016-1322-8

ORIGINAL ARTICLE

Introduction of the non-technical skills for surgeons (NOTSS) system in a Japanese cancer center

Akira Tsuburaya[1] · Takahiro Soma[2] · Takaki Yoshikawa[3] · Haruhiko Cho[3] · Tamotsu Miki[4] · Masashi Uramatsu[4] · Yoshikazu Fujisawa[5] · George Youngson[6] · Steven Yule[7]

QUESTIONS???

DO YOU NEED FEEDBACK ON FEEDBACK?

PRAELADA WONGSIRIMETEEKUL, MD

ROY PHITAYAKORN, MD MHPE (MEd)

WHAT ARE YOUR GOALS FOR THIS SESSION???

LEARNING OBJECTIVES

- Understand educational underpinnings of effective feedback
- Describe best practices and understand barriers to providing feedback
- Outline techniques and strategies for providing effective feedback
- Practice or critique feedback techniques

AN EXAMPLE OF SURGICAL FEEDBACK???

REFLECTION

- Think about the last several times you gave a medical student, resident, or co-worker negative verbal feedback.

DEBRIEF!

- In hindsight, how many felt that feedback session went well?
- Could have been better?
- Why?

WHAT IS FEEDBACK?

- **Process of providing learners with information about current performance which they can use to improve and reinforce future performance**

WHAT FEEDBACK IS NOT…

- Not corrective action!
- Not summative (but IS formative)
- Different for different genders
- Not compliments

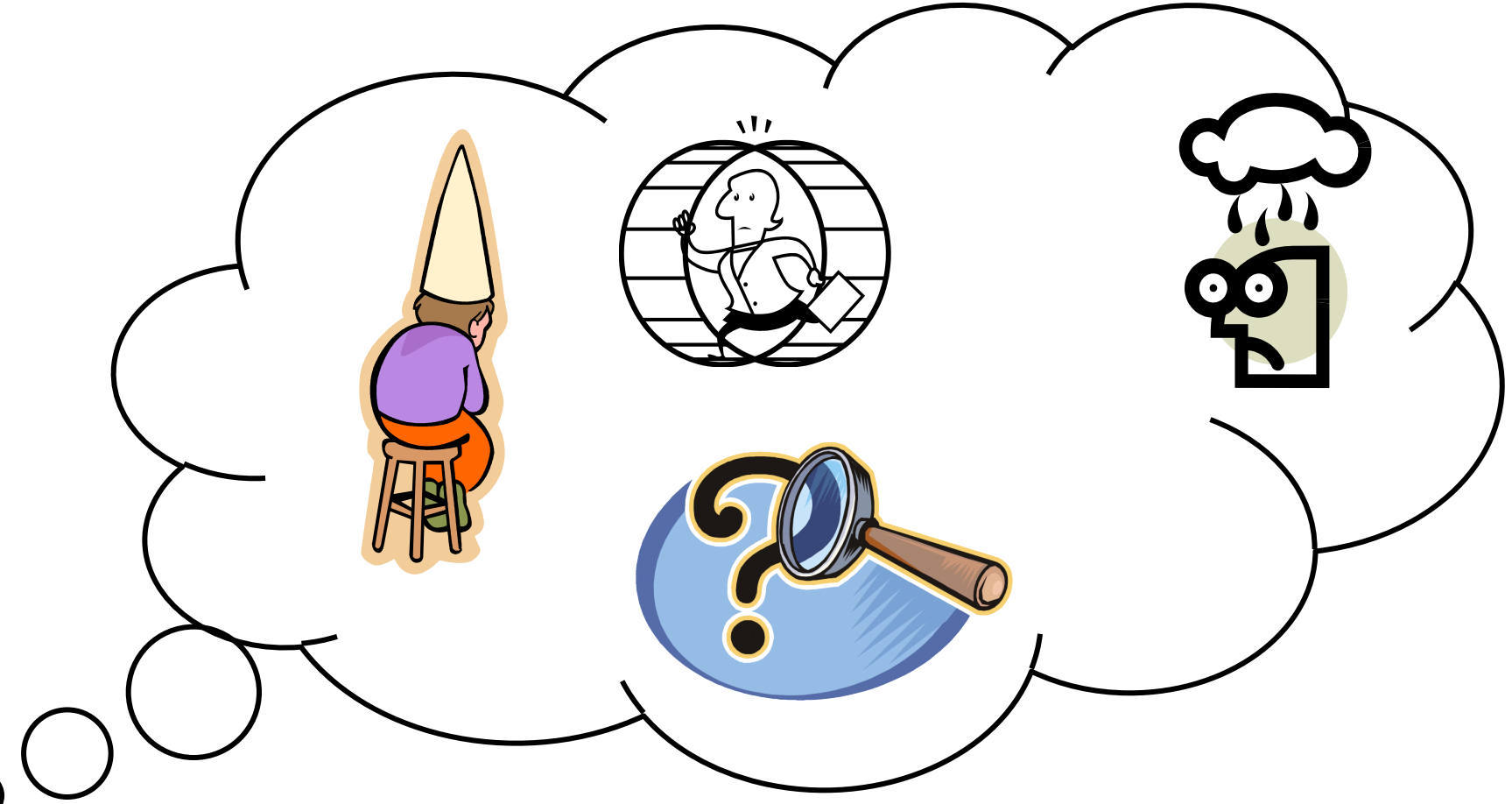
An investigation of medical student reactions to feedback: a randomised controlled trial

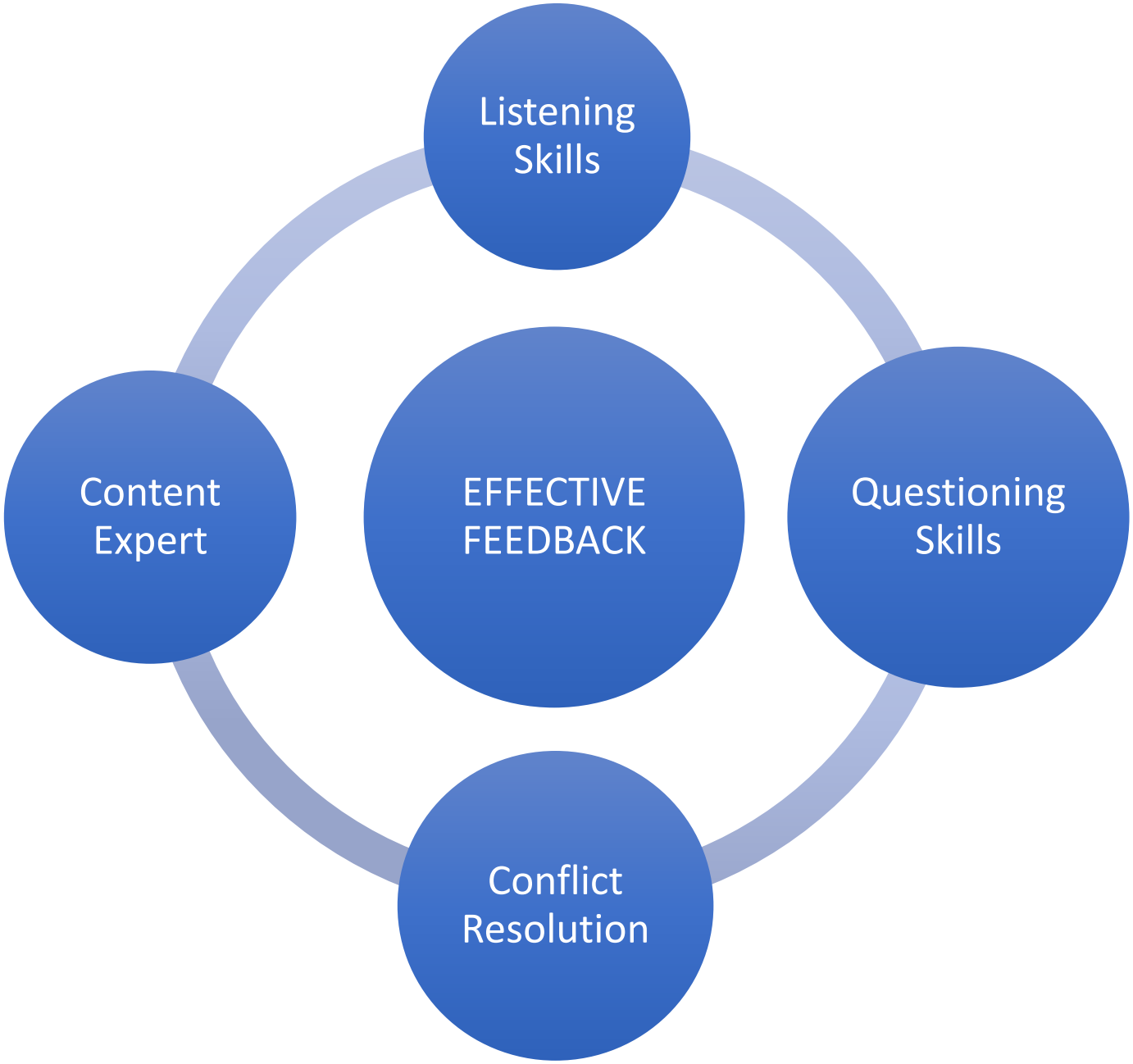
Margaret L Boehler, David A Rogers, Cathy J Schwind, Ruth Mayforth, Jacquelyn Quin, Reed G Williams & Gary Dunnington

- 33 medical students randomized to 2 groups and taught to tie two-handed knots
  - Group 1 → Specific constructive feedback
  - Group 2 → Only compliments
- Final assessment was blinded video assessment by 3 trained raters
  - Who had higher satisfaction with session?
  - Who had higher performance scores?

MEDICAL EDUCATION 2006; **40**: 746–749

WHY DO WE GIVE SO LITTLE FEEDBACK???




Listening Skills
Content Expert
EFFECTIVE FEEDBACK
Questioning Skills
Conflict Resolution

PRINCIPLES OF EFFECTIVE FEEDBACK

- Announce that this is feedback
- Timing (and timeliness)
- Environment (physical and mental)
- Direct observations
- Specific information
- Both + and – feedback (requires judgment)

POSSIBLE TECHNIQUES…

- The feedback "sandwich"
- Positive/negative/positive
- Problem is that this is known by another name for a reason…

ADVOCACY/INQUIRY

PLUS/DELTA TECHNIQUE

- From aviation CRM techniques
- Things they did well
- Things they could improve
- Ask them first!
- Have concrete examples!

WORDS TO TRY TO AVOID

- "But"
- The Royal "We"
- "Everyone"
- "Always/Never"

TIME TO PRACTICE!

- Form groups of three
- One person is the resident giving feedback (be yourself)
- One person is the person receiving feedback (have a frame and be reasonable)
- One person observes and gives feedback on the feedback exchange (look at principles)

Scenario 1: The Clinic

คุณเป็นอาจารย์แพทย์ด้านศัลยกรรมที่มีนักศึกษาแพทย์ชั้นปีที่ 4 วนมาเรียนในคลินิกกับคุณ คุณได้รับการรายงานว่านักศึกษาแพทย์รายนี้เคยมีปัญหาเกี่ยวกับด้านความสัมพันธ์กับผู้ป่วยมาสองครั้ง ซึ่งต้องมีพยาบาลเข้ามาช่วยคลี่คลายปัญหาดังกล่าว ในระหว่างวันที่นักศึกษาแพทย์ปฏิบัติงานในคลินิกกับคุณ คุณสังเกตเห็นว่านักศึกษาแพทย์รายนี้ก็ปฏิบัติงานได้ราบรื่นเป็นปกติดี จากนั้นมีผู้ป่วยหลังผ่าตัดเต้านมรายหนึ่งซึ่งได้รับการตรวจโดยนักศึกษาแพทย์รายนี้ต้องการที่จะพูดกับคุณ ผู้ป่วยแจ้งคุณว่า นักศึกษาแพทย์รายนี้ตรวจเขาอย่างไม่ทะนุถนอม ไม่ละเอียด และไม่นิ่มนวลต่อเขาเลย ผู้ป่วยคิดว่านักศึกษาแพทย์รายนี้มีพฤติกรรมที่ไม่เหมาะสม ไม่มีจริยธรรมของวิชาชีพแพทย์เลย คุณกำลังนั่งกับนักศึกษาแพทย์รายนี้ และเตรียมที่จะให้ Feedback เกี่ยวกับการปฏิบัติต่อผู้ป่วย

PRINCIPLES OF EFFECTIVE FEEDBACK

- Announce that this is feedback
- Timing (and timeliness)
- Environment (physical and mental)
- Direct observations
- Specific information
- Both + and – feedback (requires judgment)

Scenario 2: The Recovery Room

คุณเป็นอาจารย์ในศูนย์แพทย์แห่งหนึ่งที่มีการเรียนการสอนแพทย์ประจำบ้านร่วมกับโรงเรียนแพทย์ คุณได้ทำงานร่วมกับแพทย์ประจำบ้านศัลยศาสตร์ปีที่ 1 คนหนึ่งซึ่งได้รับคำชมจากอาจารย์หลายๆ ท่านว่าฉลาดปราดเปรื่อง มีความรู้ความสามารถดี แต่ในขณะที่คุณกำลังทำการผ่าตัดผู้ป่วยไส้เลื่อนด้านซ้าย ร่วมกับแพทย์ประจำบ้านคนนี้ คุณพบว่าแพทย์ประจำบ้านรายนี้มีทักษะหัตถการพื้นฐานทางด้านศัลยกรรมเช่น การผูกปม การใช้เครื่องมือต่างๆ อยู่ในระดับต่ำกว่ามาตรฐาน ตอนนี้คุณกำลังเตรียมที่จะให้ feedback หลังผ่าตัดผู้ป่วยรายนี้แก่แพทย์ประจำบ้านรายนี้ในห้องพักฟื้นผู้ป่วย

PRINCIPLES OF EFFECTIVE FEEDBACK

- Announce that this is feedback
- Timing (and timeliness)
- Environment (physical and mental)
- Direct observations
- Specific information
- Both + and – feedback (requires judgment)

Scenario 3: The Office

คุณเป็นหัวหน้ากระบวนวิชาศัลยกรรม ในโรงเรียนแพทย์ชื่อดังแห่งหนึ่ง เมื่อประมาณสิบแปดเดือนก่อน คุณได้รับการแจ้งว่าจะมีการมาตรวจเยี่ยมคุณภาพของภาควิชา คุณได้รับความคิดเห็นวิพากวิจารณ์จากนักศึกษาแพทย์และแพทย์ประจำบ้านหลายๆ คน ว่าอาจารย์ผู้ใหญ่ในภาควิชาท่านหนึ่งมีพฤติกรรมที่ไม่เหมาะสม ก้าวร้าว ไม่สนใจนักศึกษา สอนlectureที่มีเนื้อหาค่อนข้างเก่า ไม่มีการupdateความรู้ ขณะนี้คุณกำลังนั่งและเตรียมที่จะให้ feedbackเกี่ยวกับการปฏิบัติงานของอาจารย์ผู้ใหญ่ท่านนี้ในด้านการเป็นอาจารย์แพทย์ของภาควิชาศัลยศาสตร์

PRINCIPLES OF EFFECTIVE FEEDBACK

- Announce that this is feedback
- Timing (and timeliness)
- Environment (physical and mental)
- Direct observations
- Specific information
- Both + and – feedback (requires judgment)

SUMMARY

- Feedback is extremely important, but can be difficult to do well
- Feedback is a skill that requires thought and practice
- The delivery of quality feedback may require conflict resolution skills
- We can all improve