Simulation in Education: Just Do It!

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Brief Outline

- Rationale of simulation
- Appropriate usages
- Features that make simulation works
- Simulation in pediatrics
- Developing and delivering a meaningful lesson

"To study phenomenon of disease without book is to sail in uncharted sea; while to study books without patients is not to go to the seas at all."

Sir William Osler

Simulation

Device/conditions that aim to imitate anatomical models, physiological phenomena, patients, or clinical tasks.

- **Part task trainers:**
  - Harvey cardiac simulator
- **Anatomical models:**
  - Pelvis, thorax
- **Virtual reality:**
  - Endoscopy
- **Human patient simulators (HPS)**
- **Complex "integrated" simulator:**
  - virtual hospitals, virtual operating theatre

Rationale for Simulation Use

- Safe environment, mistake forgiving
- Trainee focused versus patient focused
- Controlled, structured, and proactive patient exposure
- Reproducible, standardized objectives
- Opportunity for immediate feedback
- Increase public trust in the profession

Scalese, Issenberg 2005; McGaghie 2007

Putting the Patient First: Repeated Practice

NUS National University of Singapore

Putting the Patient First: Infrequent Clinical Situations

nuhkids University Children's Medical Institute

NUS National University of Singapore

Putting the Patient First: : Emergency Team Drills

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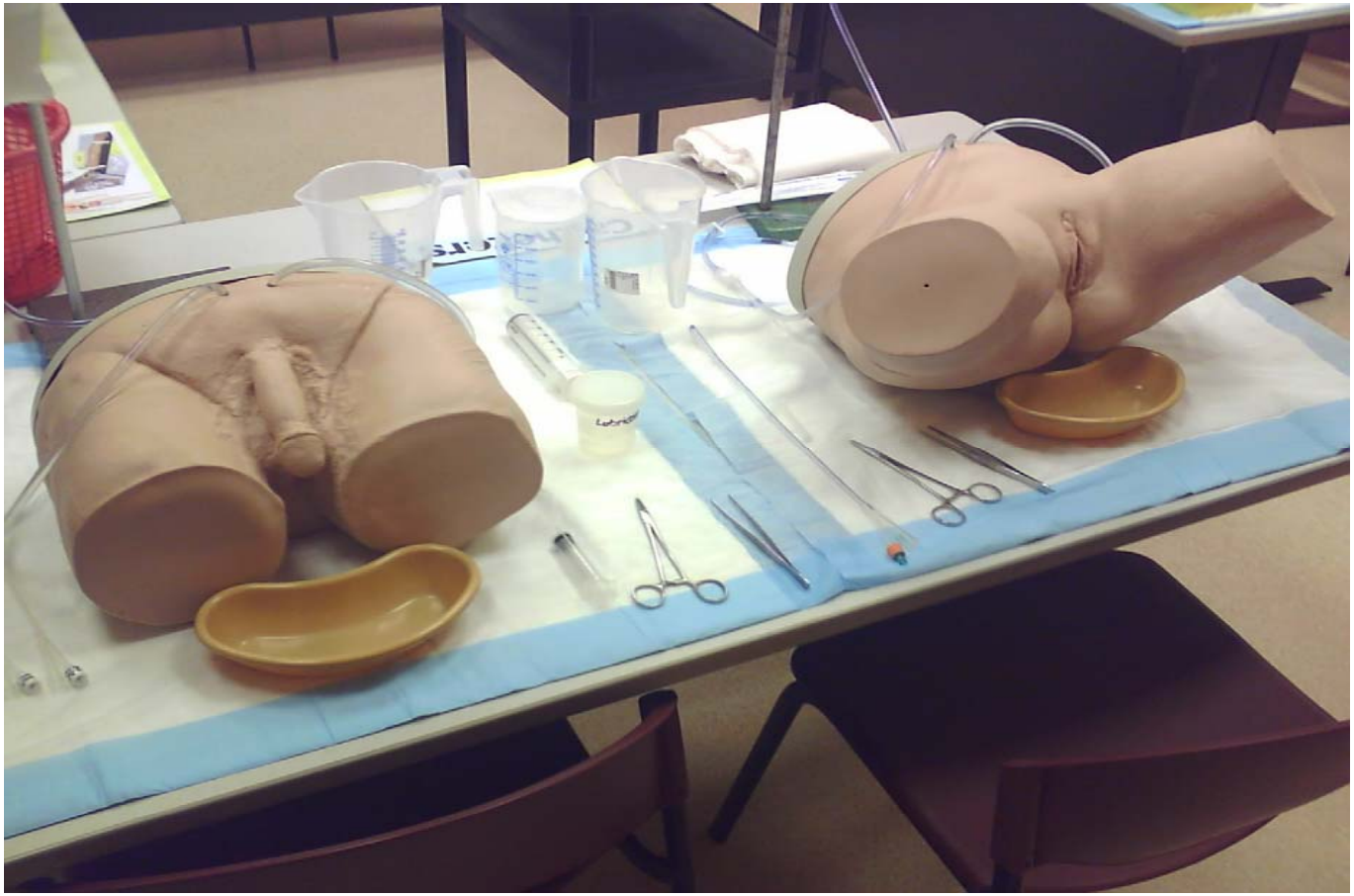
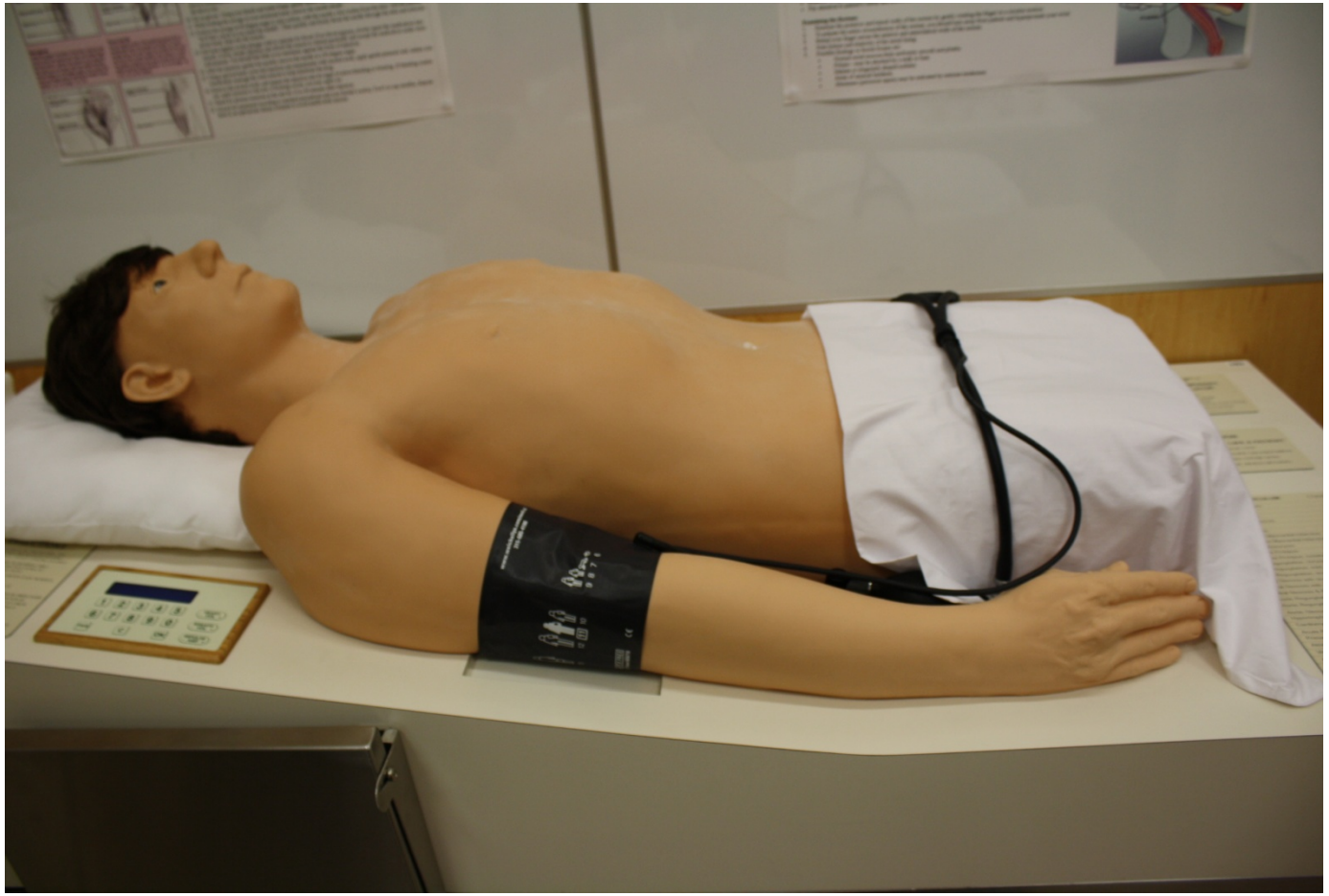
Putting the Patient First: Privacy and Comfort



Putting the Patient First: Sharpening the Clinical Skills

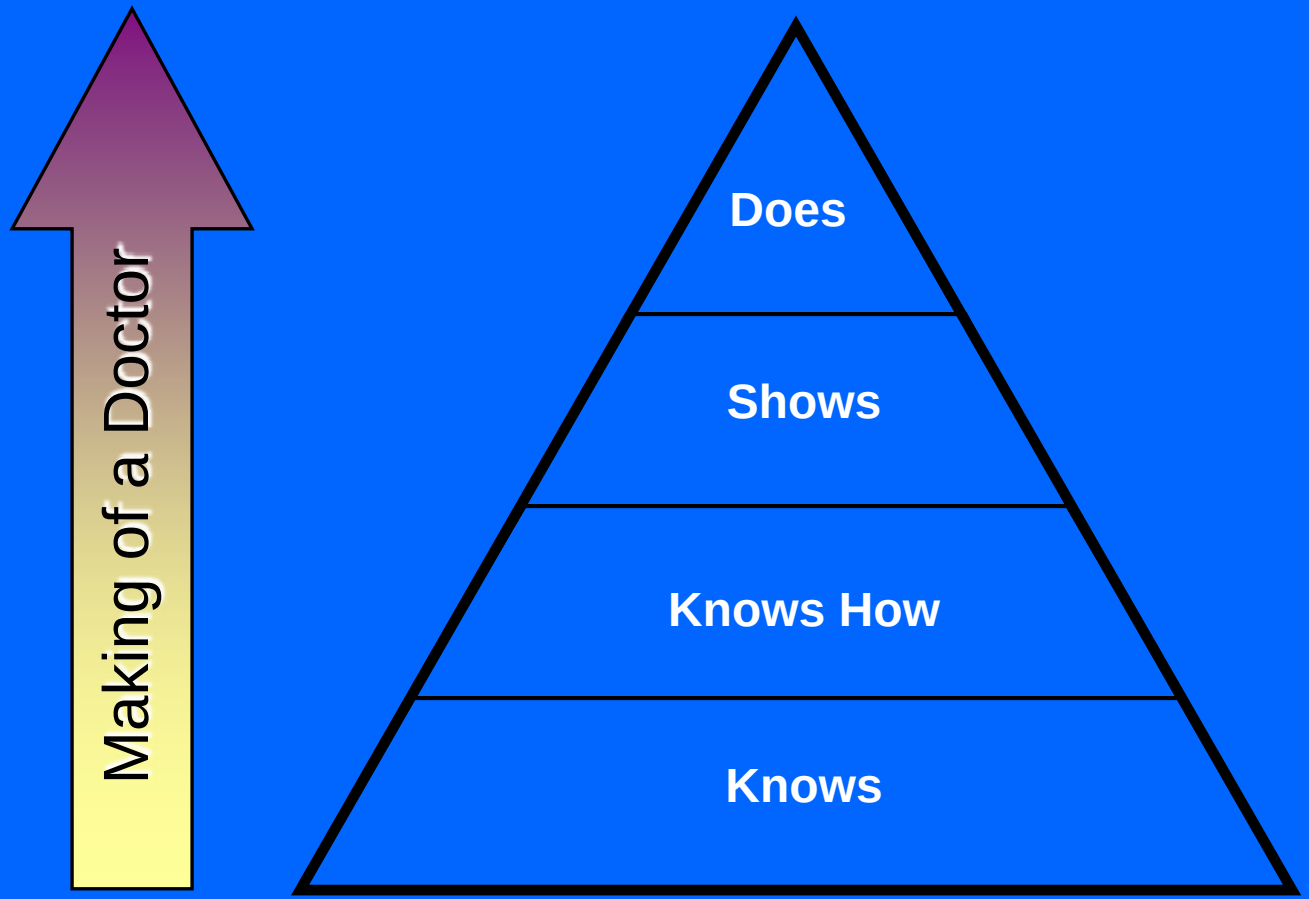


Putting the Patient First: Complex Drill

Features that Make Simulation Works

- Integration within the curriculum
- Multi-modal and flexible training
- Immediate feedback and coaching
- Repeated practice

Integration within the Curriculum



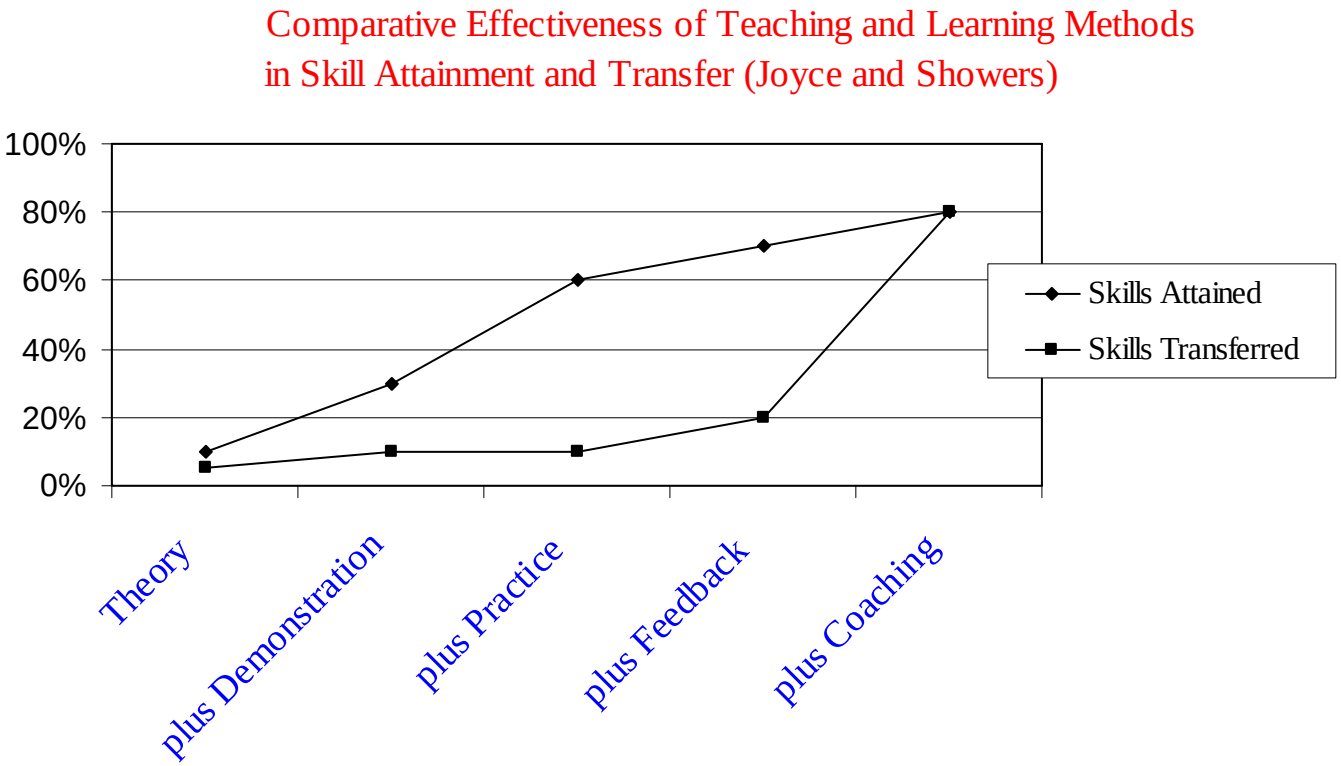
Curriculum Integration & Progressive Exposure

Learning Outcomes	Available Options
Intubation	Video >> Simulator >> Real Patient (RP)
Suture	Plastic model >> Animal tissue >> RP
Heart sounds	Audio, video >> self-learning modules >> Harvey >> RP
Pelvic examination	Anatomical model >> Standardized patients >> Anesthetized RP >> RP

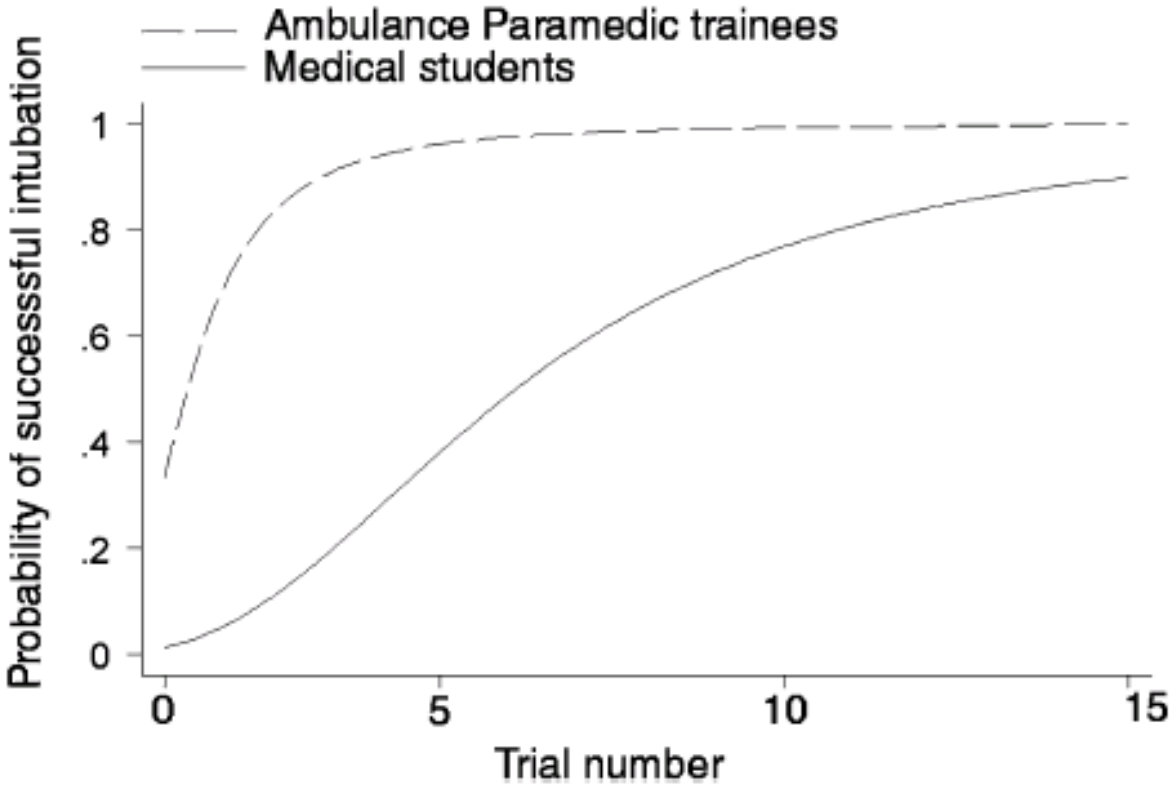
Multimodal and Flexible Training

- Large group instructor-led training
- Small group instructor-led training
- Peer teaching
- Self-learning

Feedback and Coaching



Repeated Practice and Skill Acquisition



Owen, Plummer; Medical Education 2002; 635-42

Learn to see, learn to feel, learn to smell, and know that practice alone makes perfect.

Sir William Osler

Simulation in Our Campus

- Anatomical models
- Harvey in Dept of Physiology and Science 4
  - *Book through Facility Booking*
- Skills Lab
- Anesthesia SimMan
- ACLS trainer
- Khoo Teck Puat Advanced Surgery Training Centre

Why Simulation in Pediatrics?

- Training / skill acquisition
- Staff improvement
  - **Ability to perform in a stressful situation**
  - **Trained to make decisions**
  - **Situational awareness**
  - **Conflict resolution**
  - **Communication**
- Builds confidence
- Cost effective

In Paediatrics

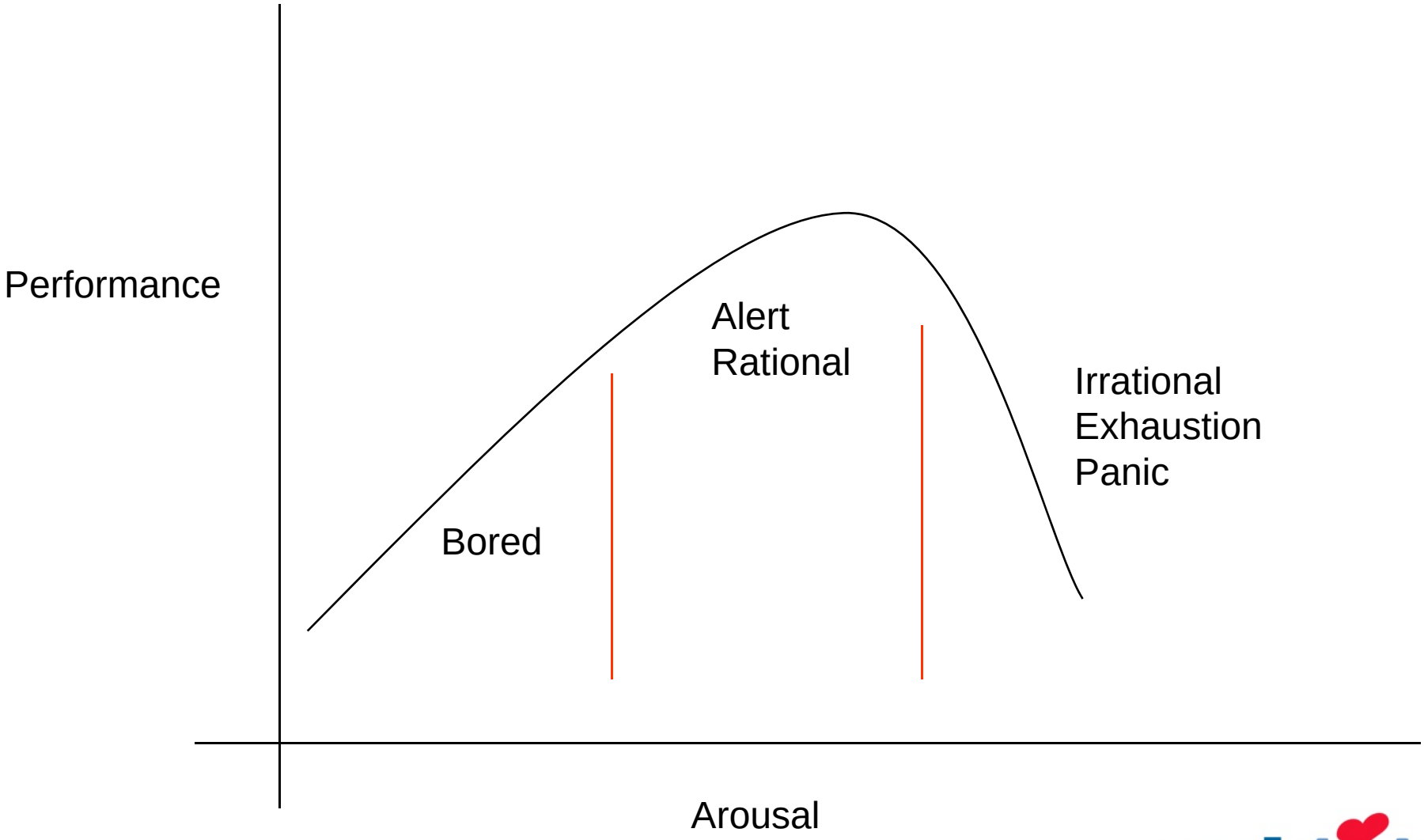
- Used to teach acute paediatric emergencies
- Mobile unit
- Mock codes with MOs, registrars and nurses
- Done in a PICU room or in the general ward

Simulation

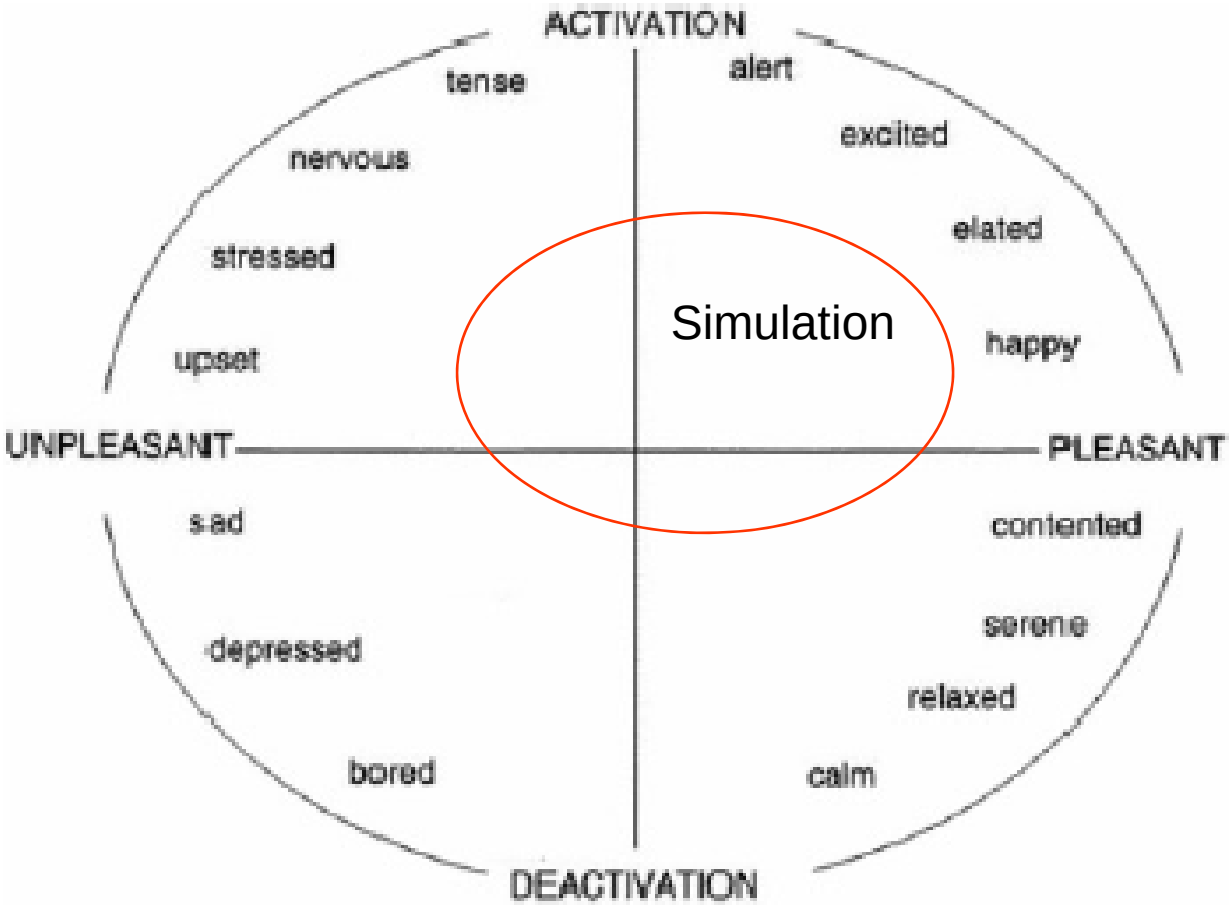
- Simulation is a learning methodology, not a technology

- Technology supports the methodology


Vitalfilm


Performance
Alert
Rational
Irrational
Exhaustion
Panic
Bored
Arousal

Circumplex Model of Affect

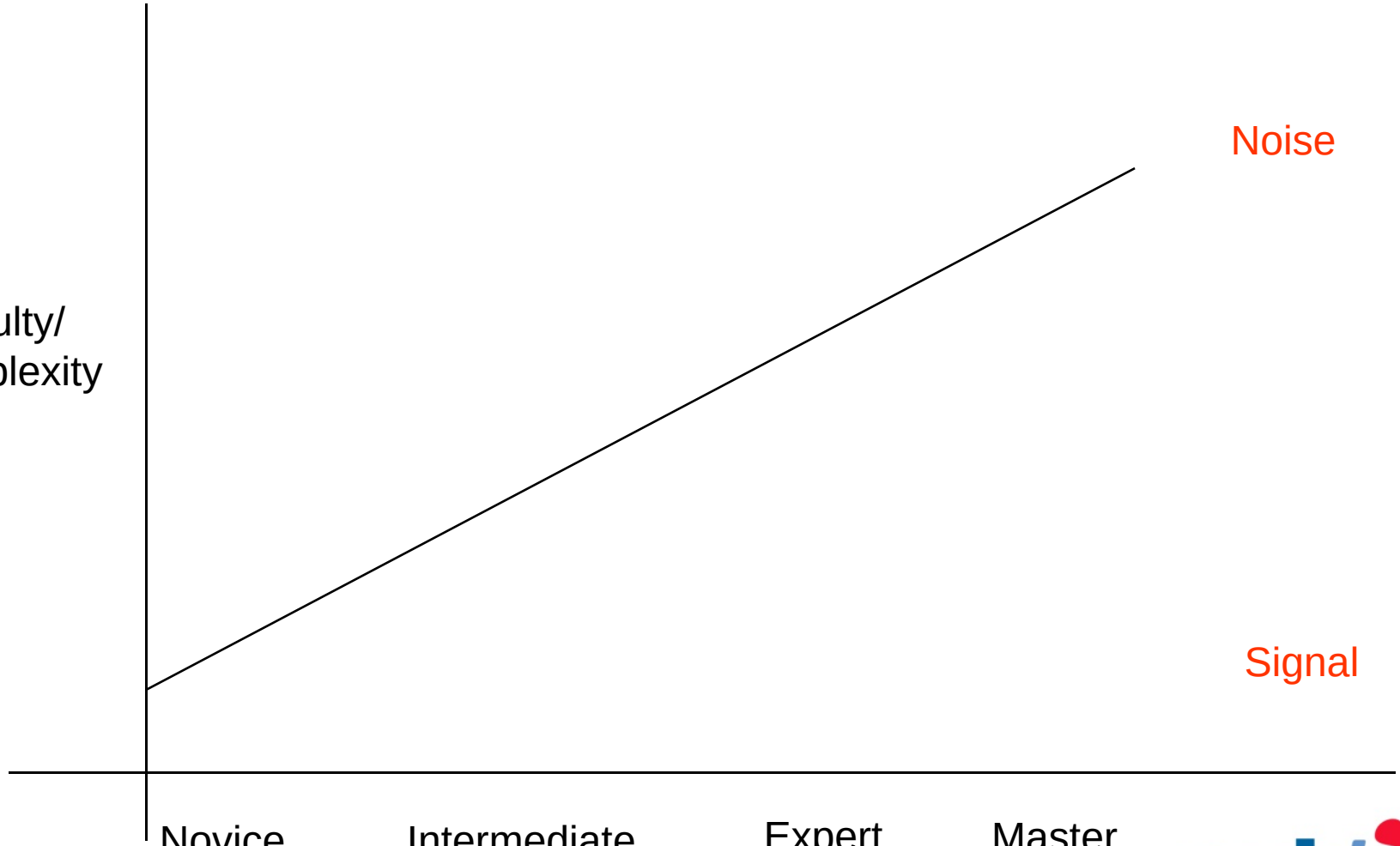


Russell, J. A. 1980

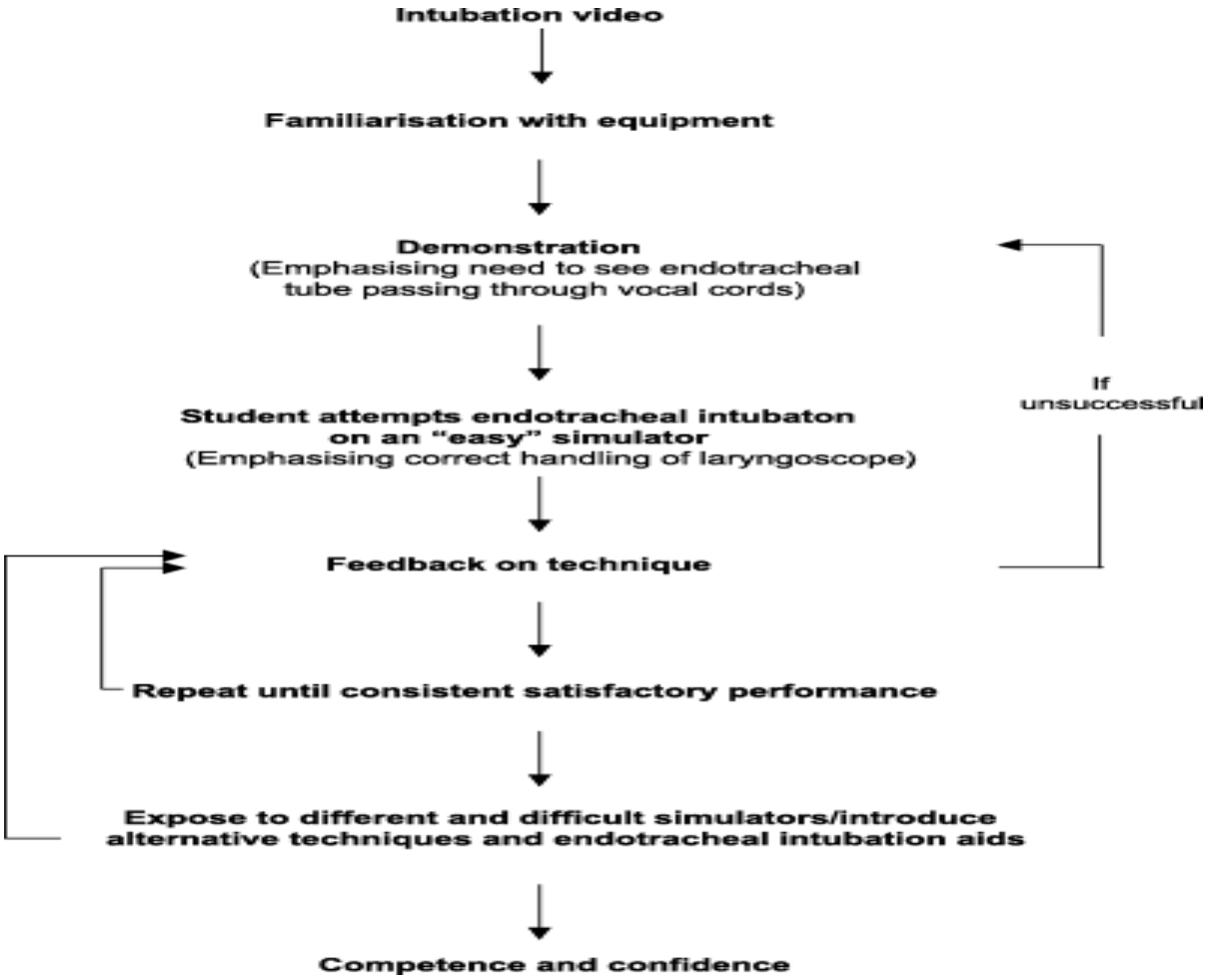
Lesson Plan

- Formulate learning objectives
- Create scenario to meet these objectives
- Teach where learner is at
- Curriculum first, technology second
- Consider all aspects of reality

Noise


Noise
Difficulty/
Complexity
Signal
Novice
Intermediate
Expert
Master

Planning for A Teaching Session



Owen, Plummer; Medical Education 2002; 635-42


7
FOR SIMULATION TRAINING
HR
149
97
NBP Cuff 31
94
NOT FOR PATIENT USE
PICU TRAINING


DRUGS
PAEDS TRAINING
LARYNGOSCOPE
Laerdal


HR
170
95
149
NBP Manual
Sys.
120
70
77/47
(57)
Link Box


ATRACURIUM


PICU

Feedback and Debriefing

- Immediately post-simulation as most will be retained
- Atmosphere dominated by mutual respect
- Facilitator acts as catalyst
- Facilitate self-discovery and self-critique

Feedback and Debriefing

- Better retention and learning
- Resolve conflicts
- Instructor evaluation important

Debriefing

- 3 phases
  - **Description**
    - Express thoughts and feelings
    - Describe intentions
    - Common understanding of what happened
    - Listen for “pearls”

Debriefing

- 3 phases
  - **Analysis**
    - Systematically examine scenario in terms of knowledge, skills and attitudes
    - Explore elements that were positive first
    - Identify, analyze and explore potential solutions to problems

Debriefing

- 3 phases
  - **Application**
    - Summarize
    - Allow participant to tell you what they have learnt
    - Link learning objectives to clinical setting

Debriefing

- Techniques
  - **Careful phrasing of questions**
  - **Encourage self analysis**
  - **Strategic silence**
  - **Explore concerns**
  - **Follow up on crew-initiated problems**

Facilitator

- Allow enough time for debriefing
  - **25% simulation, 75% debriefing**
- Ask the right questions
- Listen carefully
- Support individual learning needs
- Ensure learning objectives met

Future

- Incorporate simulation and clinical skill training into undergraduate and post-graduate paediatric education

- Better prepare students for their role as a doctor

"Learn to see, learn to feel, learn to smell

And know that practice alone makes perfect."

Sir William Osler

Acknowledgements

- Monster Inc., USA
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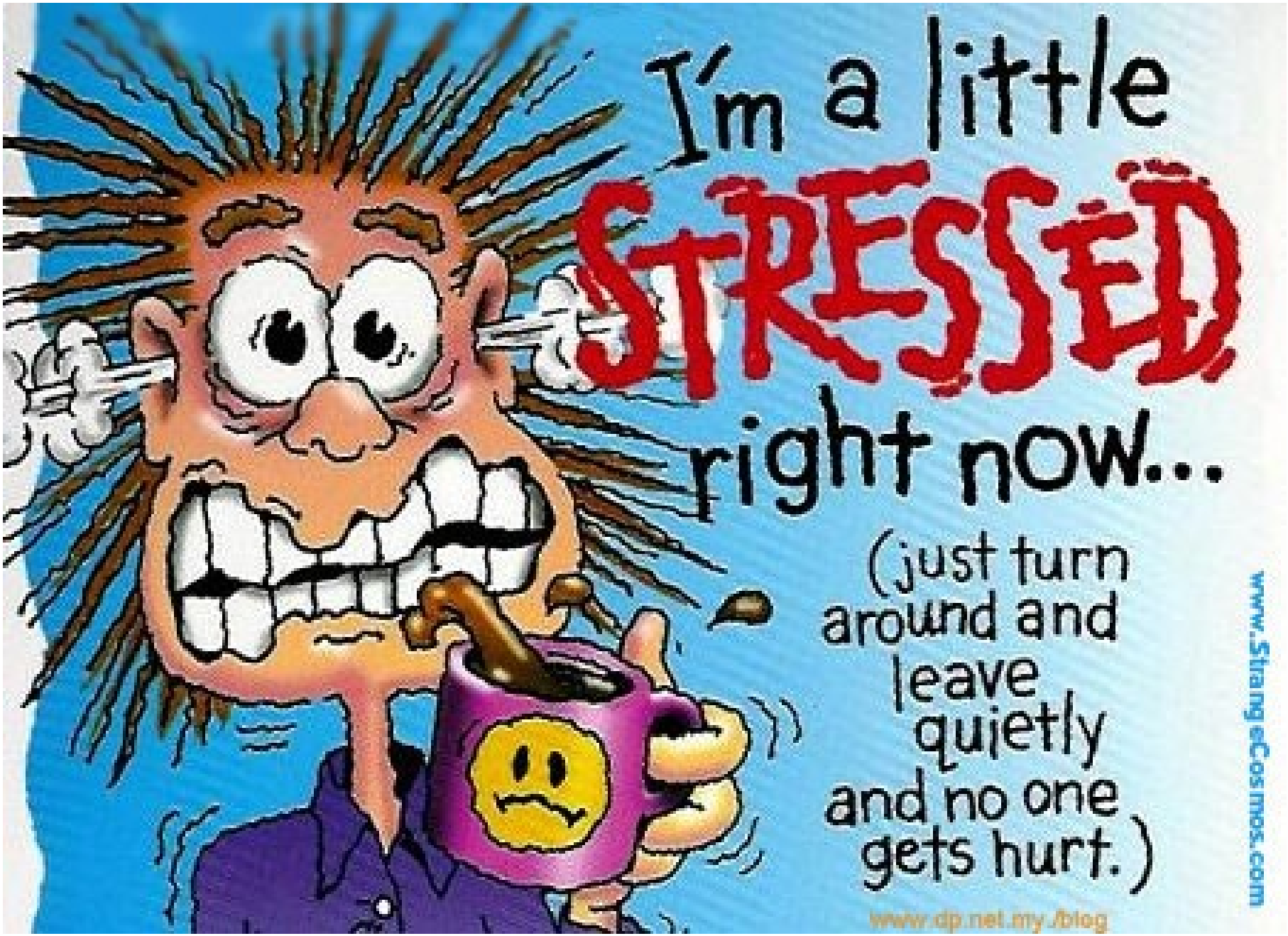
I'm a little
STRESSED
right now...
(just turn around and leave quietly and no one gets hurt.)
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