DONALD AND BARBARA
ZUCKER SCHOOL *of* MEDICINE
AT HOFSTRA/NORTHWELL®

21 November 2022

Curriculum Renewal – What is it? Why is it?

Louis Pangaro, MD, MACP

Professor of Medicine

Uniformed Services University of the Health Sciences

A question for each of you

- Given that our world is changing
  - in practice patterns
  - costs and resource constraints
  - new technologies
  - national and global uncertainties

- **what is one thing that YOU as an individual want to preserve?**
  - **please write down one thing in the chat**

Disclaimer and Disclosure

- "The opinions and assertions expressed herein are those of the author(s) and do not reflect the official policy or position of the Uniformed Services University of the Health Sciences or the Department of Defense."

- Harvard Macy Course in "Systems of Assessment in Medical Education" (honorarium).

Issues for discussion

- How can we define curriculum and renewal?
- Why would we want to revise ?
- What are methods to foster independence, create capability?

Theme

The emphasis on “competence” places faculty judgment at the center of any curricular revision.

Terms - Syllabus v. Curriculum

Syllabus: a list to be covered ('content')

Curriculum = a "race"

- **what we do to leaners ('pedagogy')**
- **what we ask them to do**

Many terms for curricular “change”

Renewal: making new, updating

Reform: shaping; (pejorative?)

Redesign: planning anew

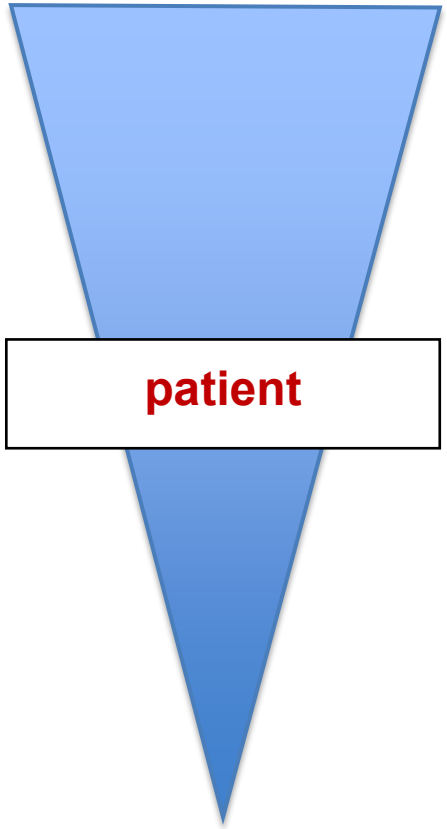
Revision: “seeing” things differently

Commitment to Understanding mechanism

System Science

Clinical Science

Basic Science



State/nation
Society/organization
Neighborhood/church
Medical Home
Caregiver/Family

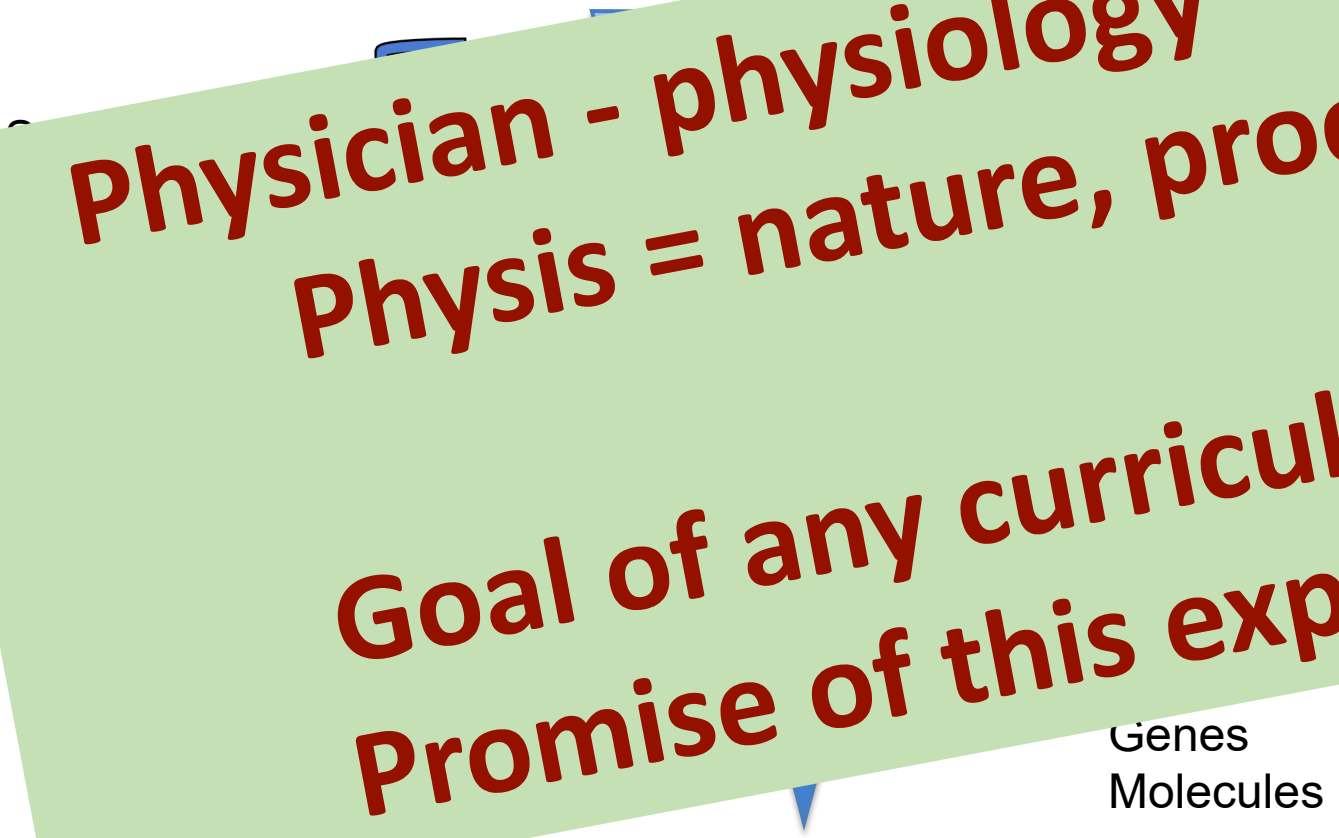
Systems
Organs
Cells
Genes
Molecules

After, Pangaro, *JIAMSE,* 2010; Med Sci Ed, 2022

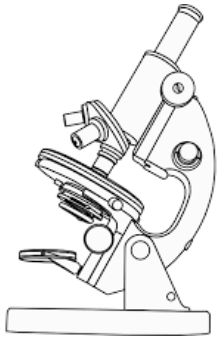
Commitment to understanding mechanism

Physician - physiology – physics
Physis = nature, process

Goal of any curriculum =
Promise of this expertise



Why have we revised?



Historically

- 1910 - Flexner - more to know = basic science

- 1990s - Need for "professionalism"
  → early clinical experience,
  → inter-personal skills and standardized patients

Finnerty, Flexner Revisited, *Acad Med*, 2010

Why do we continue to change things ?

- Practice of medicine has changed dramatically
  - Climate change, pandemics, unstable politics
  - EHR, AI and machine learning
- Integration now a priority in accreditation
  - Relevance to patients, social awareness
- New curricular opportunities
  - MD-MPH; MD-MBA, MD-MHPE
- Student learning styles have changed
  - Adult learning; technology; life-long learning

Trends in curricular reform, Post-Carnegie II (1)

Changes to Curricular Structure/Organization: (22.9%)

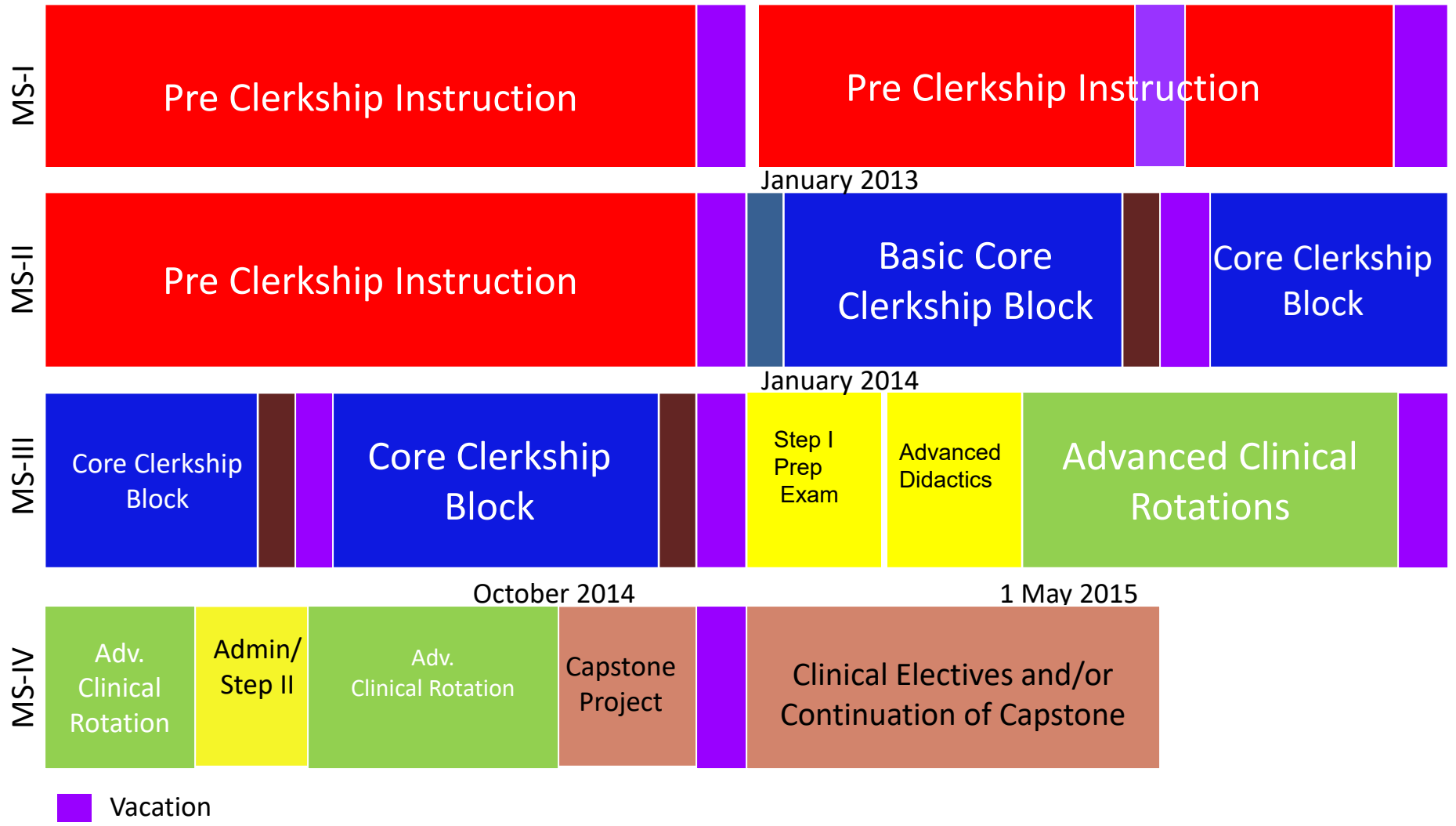
- Shortened Pre-Clerkship Curriculum (2+2)
- Re-Alignment of USMLE Step 1 Exam to after clerkships

Step 1 scores increased significantly following curricular revision (10 points, SD 18.2) after controlling for MCAT and undergraduate GPA.

Torre, *TeachLearnMed*, 2020

- Increasing Opportunity for Electives in MS-3 Year
- Three-Year Medical School Track

Pock, *BMC Medical Education* (2019)


MS-I
Pre Clerkship Instruction
Pre Clerkship Instruction
January 2013
MS-II
Pre Clerkship Instruction
Basic Core Clerkship Block
Core Clerkship Block
January 2014
MS-III
Core Clerkship Block
Core Clerkship Block
Step I Prep Exam
Advanced Didactics
Advanced Clinical Rotations
October 2014
1 May 2015
MS-IV
Adv. Clinical Rotation
Admin/ Step II
Adv. Clinical Rotation
Capstone Project
Clinical Electives and/or Continuation of Capstone
Vacation

Trends in curricular reform, Post-Carnegie II 2)

Changes to Curricular Content: (30.3%)

- Reinforcing Basic Science in the Clinical Years –
  - did this really happen?
- Early Clinical Exposure
  - Go further?

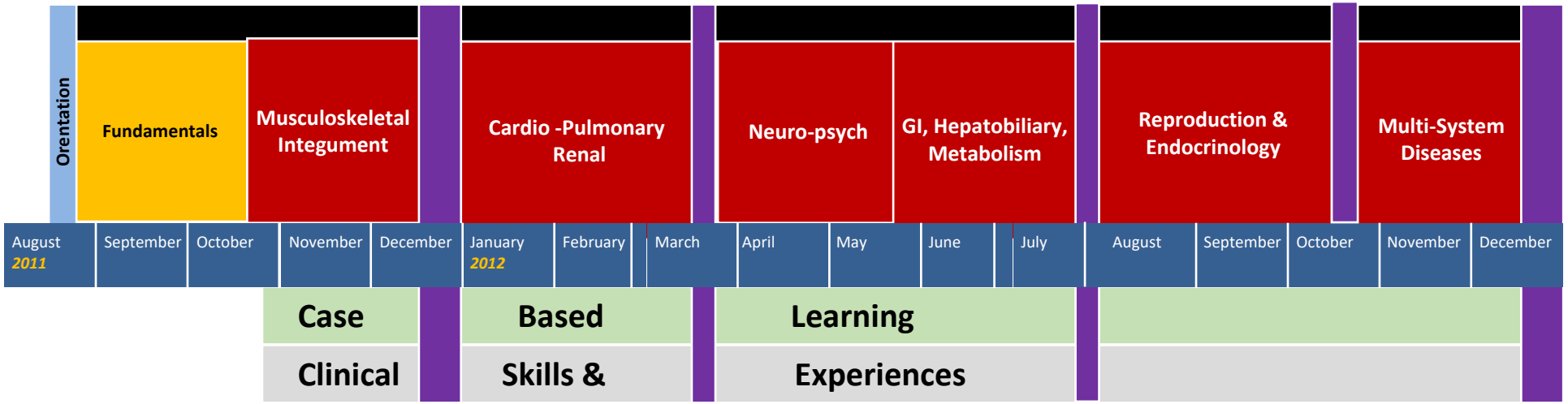
Trends in curricular reform, Post-Carnegie II (3)

Changes to Curricular Delivery: (33.6%)

- Enhanced Curricular Integration
  - Away from 'discipline-based' courses
- Decreased Reliance on Lectures
- Pre-Clerkship "Boot Camp"

Pock, *BMC Medical Education* (2019)

Pre-Clerkship Period



Trends in curricular reform, Post-Carnegie II (4)

Changes to Assessment: (10.6%)

- Developing a Competency Based Assessment
  - Tasks, not simply MCQ tests
- Elimination of Traditional (Letter) Grades

- Assessment Tracking
  - What if anything gets better over modules, clerkships?

Pock, *BMC Medical Education* (2019)

60 years of "reform without change"

"Beyond the Classroom"

- [desired change] …cannot be accomplished by adding to or changing existing curricular components,…
- … must include a change in the teaching and learning environment, ….

"EMT Training"

- or in what we mean by socialization for a profession…"

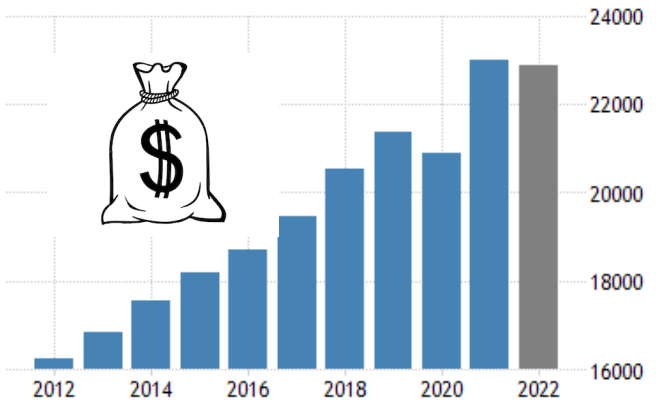
"Early Patient Interactions"

Bloom SW, *Amer J Public Health*, 1995

The major theme: med education = "public good"

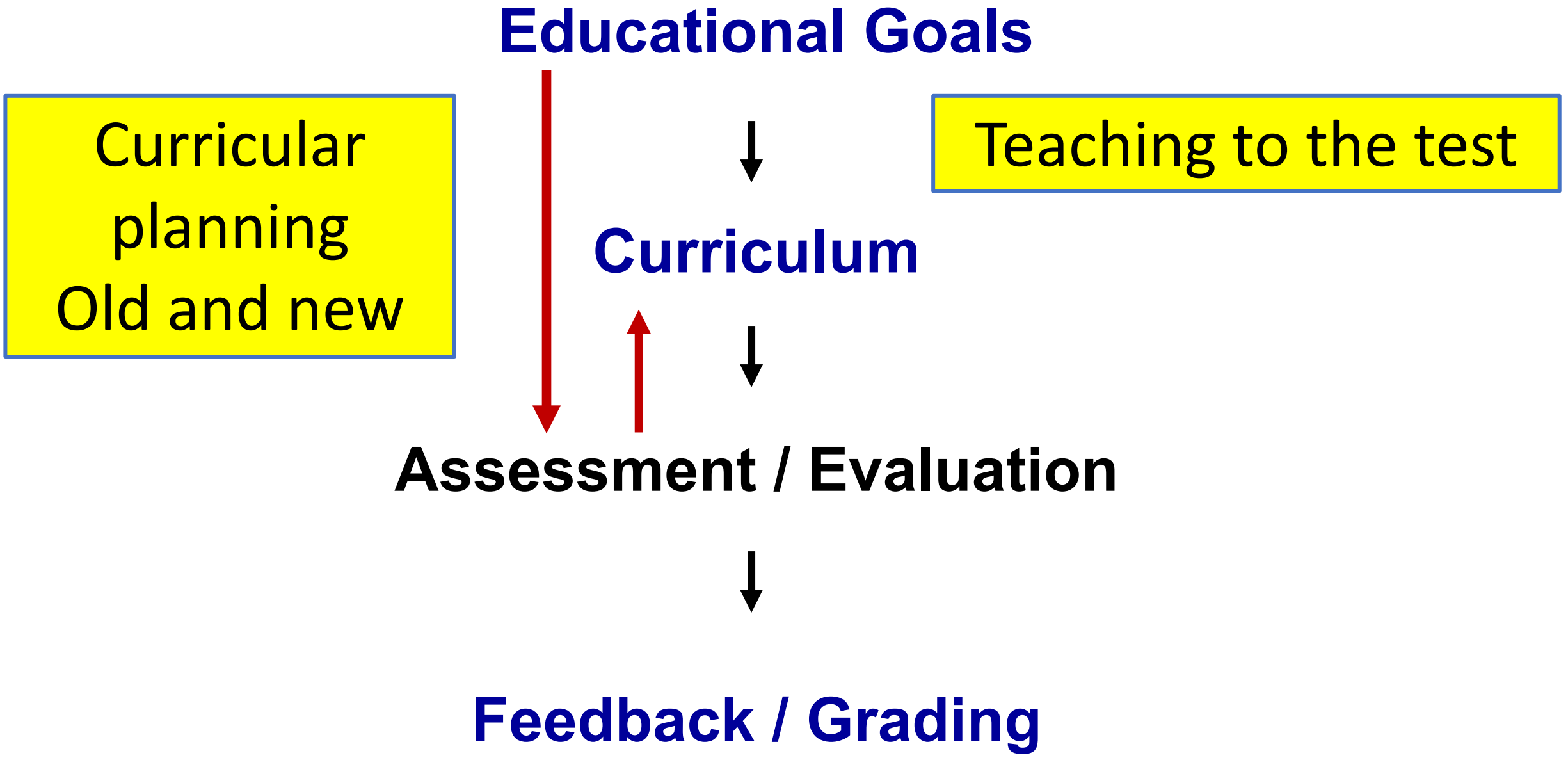
dollar cost (GDP) and human cost ("to err is human")

- Reasoning and decision making
- High value care
- Health system science (HSS)
- Competency-based medical education (CBME)



what is (are) the problem(s) CBME is trying to solve?

- What is the strategic goal?
  - Medical education is a social good,
  - Showing that “we serving the public trust”
- What is the tactical goal?
  - Documentation of the functional level achieved, not simply fund of knowledge
    - Move from analytic frameworks (KSA, “competencies”to synthetic frameworks (RIME, milestones, EPAs)
  - documentation and measurement →


Educational Goals
Curricular planning
Old and new
Teaching to the test
Curriculum
Assessment / Evaluation
Feedback / Grading

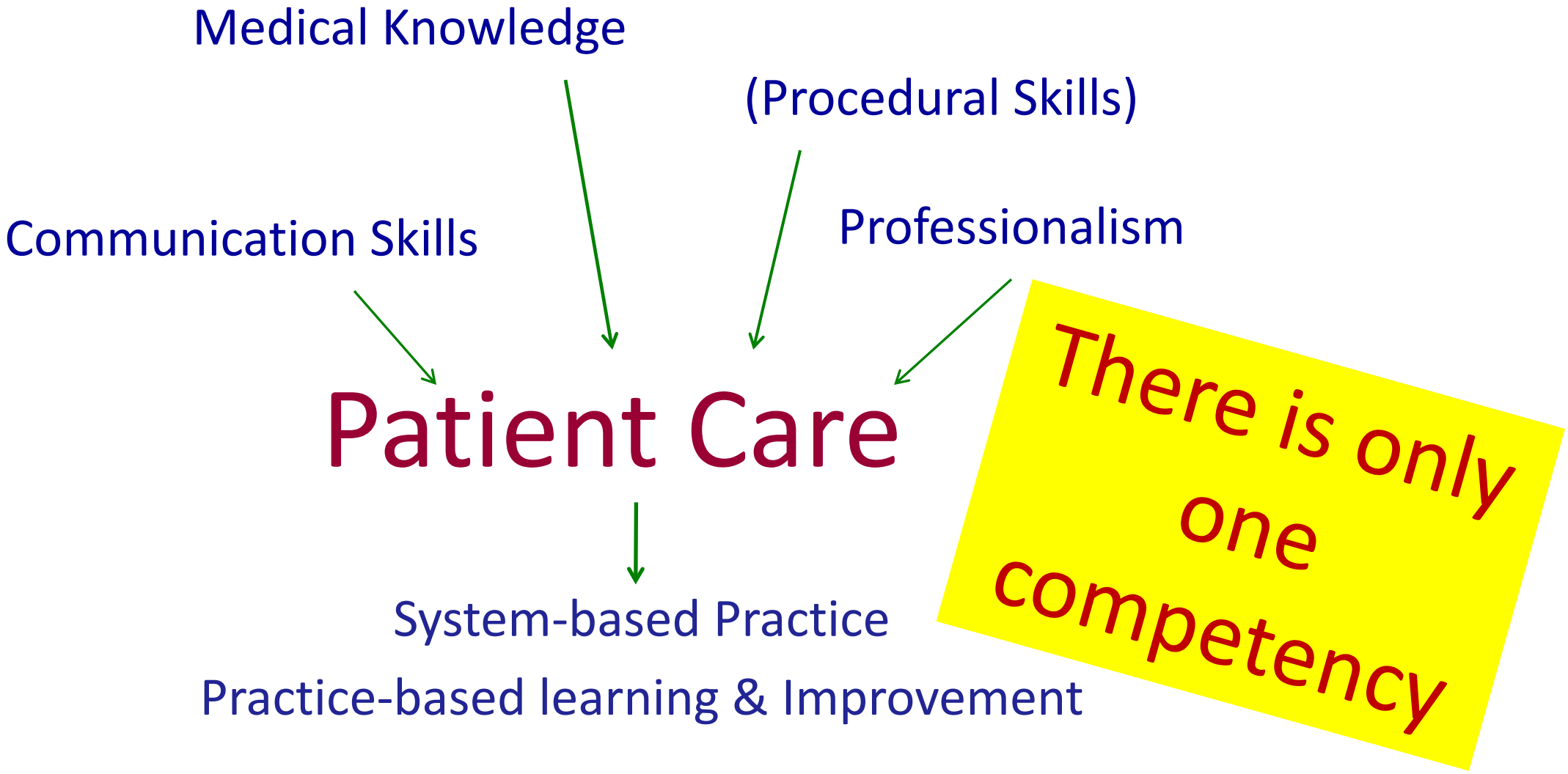
How to test "competency"?

Summative

- *In vitro* = MCQs , OSCE, etc. = standardized
- *in vivo* = direct observations by faculty

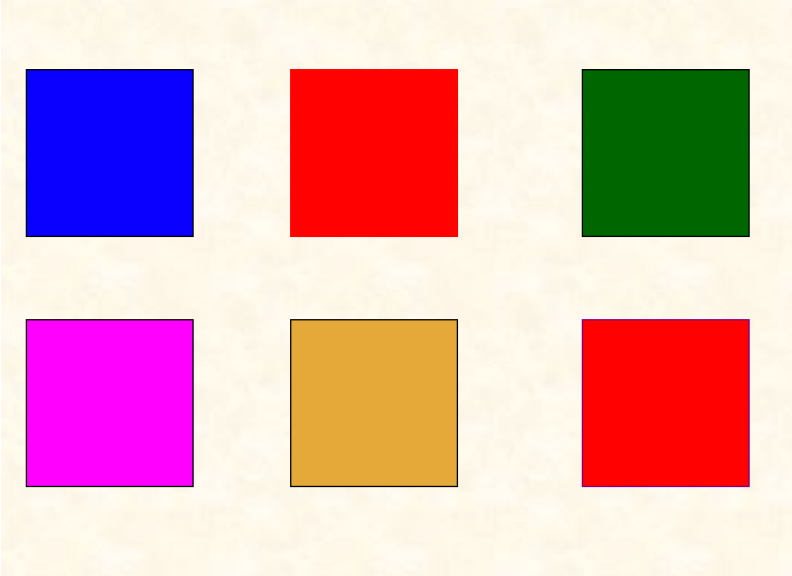
Formative

- *In vivo* = real patients, complex, contextual
  - not standardized → direct observations by faculty


Medical Knowledge
(Procedural Skills)
Communication Skills
Professionalism
Patient Care
System-based Practice
Practice-based learning & Improvement
There is only one competency

Competence defined (analytic framework)

The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and the community being served.



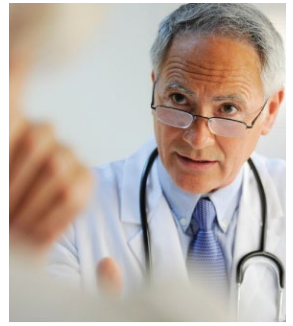
Epstein, Hundert, *JAmerMedAssoc*, 2002

Competence Defined Synthetically

The ability to give to each situation all that belongs to that situation, and no more.

Only faculty can judge competence

Pangaro, Med Teach, 2000



In curricular renewal what is the role of (busy) faculty?

entrustment of students
vs.
entrustment and support of faculty

Barriers to evaluation in CBME

Cognitive

- goals & objectives may vary across teachers;
- school's mental model may be very elaborate

Social/Emotional

- Teacher is not a dispassionate servo-mechanism; 'mentoring';
- limited interaction → not confident

Logistic/Resources

- Time (!) for observation, training; other priorities
- Infrastructure
- electronic forms?

Syllabus (What?) vs Curriculum (How?)

If it's a list to be covered, then adding things, and integration is how faculty arrange things in the schedule.

If curriculum is a way of doing, then it's how students arrange things in their head, visualization.

Strategy of simplicity

- Curriculum is not content; it is a relationship with “content”, guided by teachers

- Curriculum is an invitation to progress.
  - Understanding → Action

Defining curricular Success and Failure

A beginning intern from my own medical school sees a patient with thyrotoxicosis who needs medication

Simple program evaluation

- I would be happy if….

They could describe iodine metabolism and how methimazole worked.

Structure of Program Evaluation, TLM, 2007

Simple program evaluation

If not knowing these basic mechanisms, they were not restless until they filled the gap

I would drop dead with embarrassment if….

evaluation of whether the expectation ("set point") has been internalized

If not knowing these basic mechanisms, they were not restless until they filled the gap

1. Recognizes the gap
2. Has a concept of adequate knowledge
3. Search strategy
4. Commitment

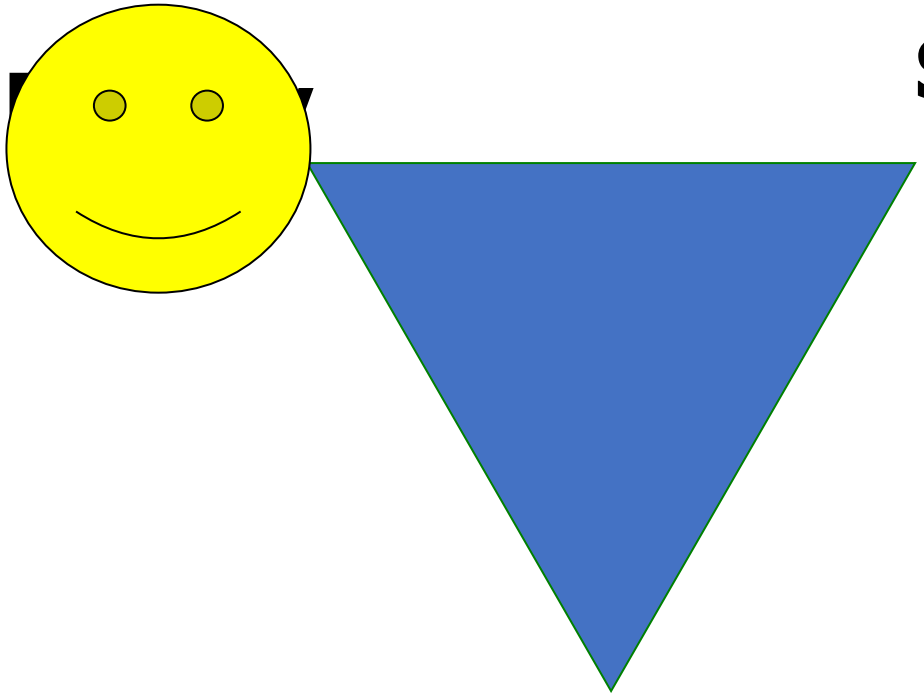
Professionalism:
"a promise of expertise and a promise of duty"

Edmund Pellegrino

Internalized

Capability = a "faculty"

The essential goal: progressive independence of the learner



After Stanford Faculty Development Center

Understanding → Action

Reporter/Interpreter	Manager/Educator
Cognitive	Ethical
Expertise > Duty	Expertise = Duty

"Beyond the Classroom"

“Three acts”

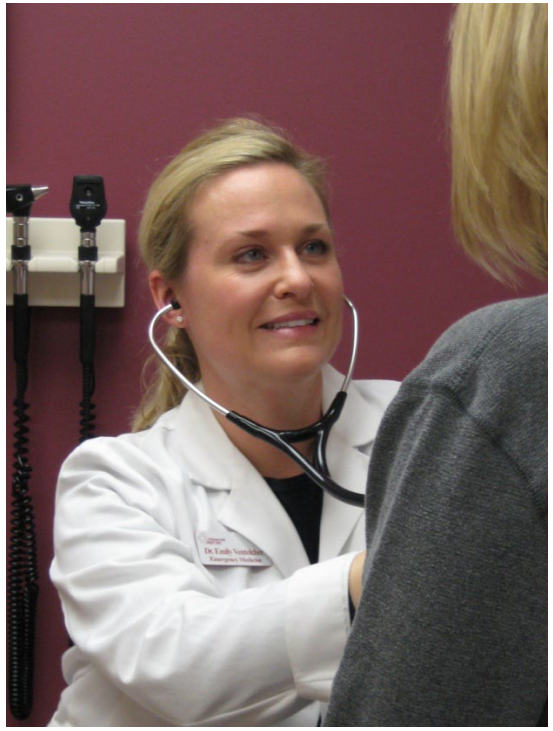
Home → Clinic → Home

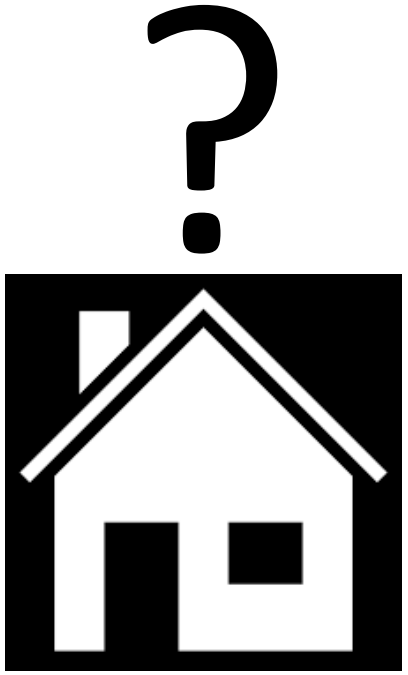
H&P

HPI:

This Pt is a 34 yo AA/Filipina female with PMHx of Lupus nephritis class IV who presents to the Walter Reed Nephology Clinic today for evaluation/management of presumed Lupus Nephritis flare.

The Patient was first Dx with SLE in 2014 with presenting sx of hair loss, joint pain, and fatigue that occurred in the postpartum period. She was then Dx with LN in 2015 with biopsy showing class III/IV (only 3 glomeruli) and was treated with MMF at that time. A LN flare occurred in 2017 and she was hospitalized from 30NOV-1DEC2017 and was treated with solumedrol pulse. At that time a 2nd renal biopsy was performed revealing crescentic LN. After discharge from the hospital (Dec 2017) treatment continued with MMF 1500mg BID. The patient was again admitted in JUL2018 with nephrotic syndrome and was treated with solumedrol pulse from 20-22JUL18 and then with readmission soon after. A 3rd biopsy was performed during on 24JUL18 revealing LN IV. She was then treated with the NIH protocol 28JUL2018-21DEC2018 due to failure of MMF maintenance therapy. Once NIH protocol was complete (Jan 2019), she was started on maintenance therapy with MMF (JAN2019) and steroid tapered to 5mg daily by APR2019. At last visit to the Walter Reed Nephology Clinic (Aug 2020) she was on MMF 750mg BID and 5mg Prednisone daily and appeared to be in remission based upon labs and clinical impression.





Performance award metaphor

We are supporting actors in someone else’s life

HSS - Social determinants

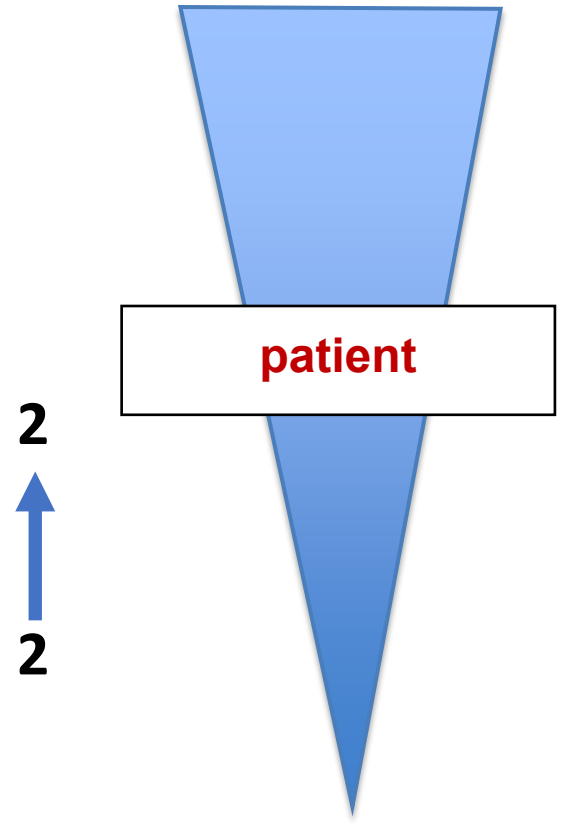
- Determine 40% of variation in health status
  (4 times as much as health care)

Berwick, NEJM, 2022

What part of this is our problem to fix?
Can it be done in the 20th century model?

"20th century" models

- *"2 +2"*
- *Exclusively apprenticeship* model
  → *academic* model



Flexner Revisited: The Role and Value of the Basic Sciences in Medical Education

Finnerty, Chauvin, Bonaminio, Andrews, Carroll, Pangaro, *Acad Med*, 2010

Can understanding be formed in the context of the classroom?

Alternatives:

- Spiral curricula
- Zucker SoM's method
- Abandon Flexner's 2+2 ?

What is the capability we must create?

- An internalized ”set point”
- A standard against which learners judge their current performance?
  - “What they did”, not “who they are”.

- A mental model of what expertise and duty look like

- Preclerkship = developing prototypes
- Clinical years = moving from understanding to action

preclinical med ed should include

- the basic sciences : anatomy, biochemistry, neuroscience, physiology, genetics, molecular biology, microbiology, immunology, pathology, and pharmacology

- behavioral science

- biostatistics, epidemiology
- public health
- critical assessment of the medical literature

Finnerty, Acad Med, 2010

Understanding → Action

Reporter

Interpreter

Manager/Educator

System-based Practice	Practice-based Learning

Curriculum = a series of invitations that fosters this progress

The RIME rhythm is familiar:

H&P……	**…….S.0…..**	**Reporter**
Assessment..	**….A……P……**	**Interpreter**
Plan……	**……..**	**Manager/ Educator**

Frame of Reference Performance	Performance Dimensions
REPORTER	
	Gather a history and perform a physical exam
	Document a clinical encounter in the patient record
	Provide an oral presentation of a clinical encounter
	Collaborate as a member of an interprofessional team
INTERPRETER	
	Prioritize a differential diagnosis following a clinical encounter
	Recognize a patient requiring urgent or emergent care
	Recommend* and interpret common diagnostic and screening tests
MANAGER	
	Enter and discuss orders and prescriptions
	Give or receive a patient handover to transition care responsibility
	Obtain informed consent for tests and/or procedures
	Perform the general procedures of a physician
EDUCATOR	
	Form clinical questions and retrieve evidence
	Identify system failures and contribute to safety and improvement

Assessment - Curricular Success and Failure

A student sees a patient with thyrotoxicosis

What's the role of the clinical faculty ?

"WHAT DO I NEED TO KNOW?" about a therapy*

- How does it work? **(inhibit the formation and coupling of iodotyrosines in thyroglobulin)**
  - affecting the relevant anatomy or physiology
  - if a drug, pharmacology; what are the indications? genetic variation?
- How good is it?
  - efficacy - short term, long term - are there relapses
  - how good is the evidence?
  - necessary, appropriate, equivocal or inappropriate for the con
- How bad is it?
  - risks, side effects (severity and frequency) , contra-indications
  - costs
  - alternatives?

*Medical/Lifestyle/Surgical/Radiation

Other concepts of adequate knowledge

- **"WHAT DO I NEED TO KNOW?" - ABOUT A DISEASE OR SYNDROME**
  - **What is it?**
  - **What does it look like and behave?**
  - **What do we do about it?**

- **"WHAT DO I NEED TO KNOW?" - ABOUT A TEST**
  - **How does it work?**
  - **How good is it?**
  - **How bad is it?**

"WHAT DO I NEED TO KNOW?" - ABOUT A DISEASE OR SYNDROME

I. DEFINITION ("What is it?")
- Can you explain to another what the label means? What it includes/excludes?
- Diagnosis: Complete diagnosis, classification (Is there a further classification or "staging"?)
- How is the diagnosis made? (When can we be sure the patient has the "label" proposed?)
- Pathophysiology (consider this NON-NEGOTIABLE information).

II. CLINICAL PICTURE ("What does it look like?")

- Symptoms, Signs, Lab (How does each reflect pathophysiology?)
- Who is at risk for this disease? How common is it? Can it be detected/prevented?
- How do age, gender, race, ethnicity, affect prevalence and presentation?
- Differential Diagnosis (What else can look like this?)
- Natural history (What happens, if you do nothing, in most patients?)
- Complications (What's the worst, in how many patients?)

III. TREATMENT ("What do we do about it?") See also "About a Specific Therapy" below.

- Options for treatment: Medical/Lifestyle/Surgical/Radiation (Does treatment alter the pathophysiology? Mechanisms?)
- Treated history – Value of each option? Is there a standard therapy (necessary or appropriate)? how good is it compared to natural history? What should be followed?
- Safety (How "bad" is each therapy, risk, costs and pitfalls?); are some equivocal or inappropriate?

"WHAT DO I NEED TO KNOW?" - ABOUT A SPECIFIC THERAPY to decide its value

I. How does it work? (affecting the anatomy, physiology or genetic variation; if a drug, pharmacology; what are the indications?)
II. How good is it? (efficacy - short term, long term - are there relapses? how good is the evidence? what is the value – necessary, appropriate, equivocal or inappropriate for the condition?)
III. How bad is it? (risks, side effects, costs; contra-indications); alternatives?

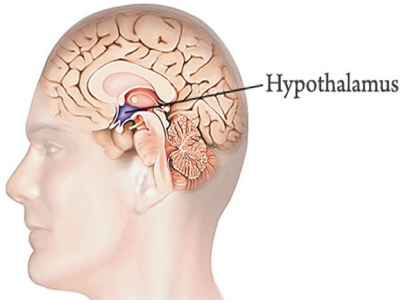
"WHAT DO I NEED TO KNOW?" - ABOUT A TEST (Again, there are three things to decide value)

I. How does it work? (How does it address the physiology or anatomy?
How will we use the result? does it change management?
II. How good is it? (sensitivity, specificity, reproducibility; predictive value)
III. How bad is it? (risk of the procedure, costs, financial and otherwise).
What are the alternatives?

Pangaro, USUHS, v.2015

- Internalization of what constitutes adequate basic knowledge
- What a "promise of expertise" looks like
- Is the student acquiring a standard against which to compare?

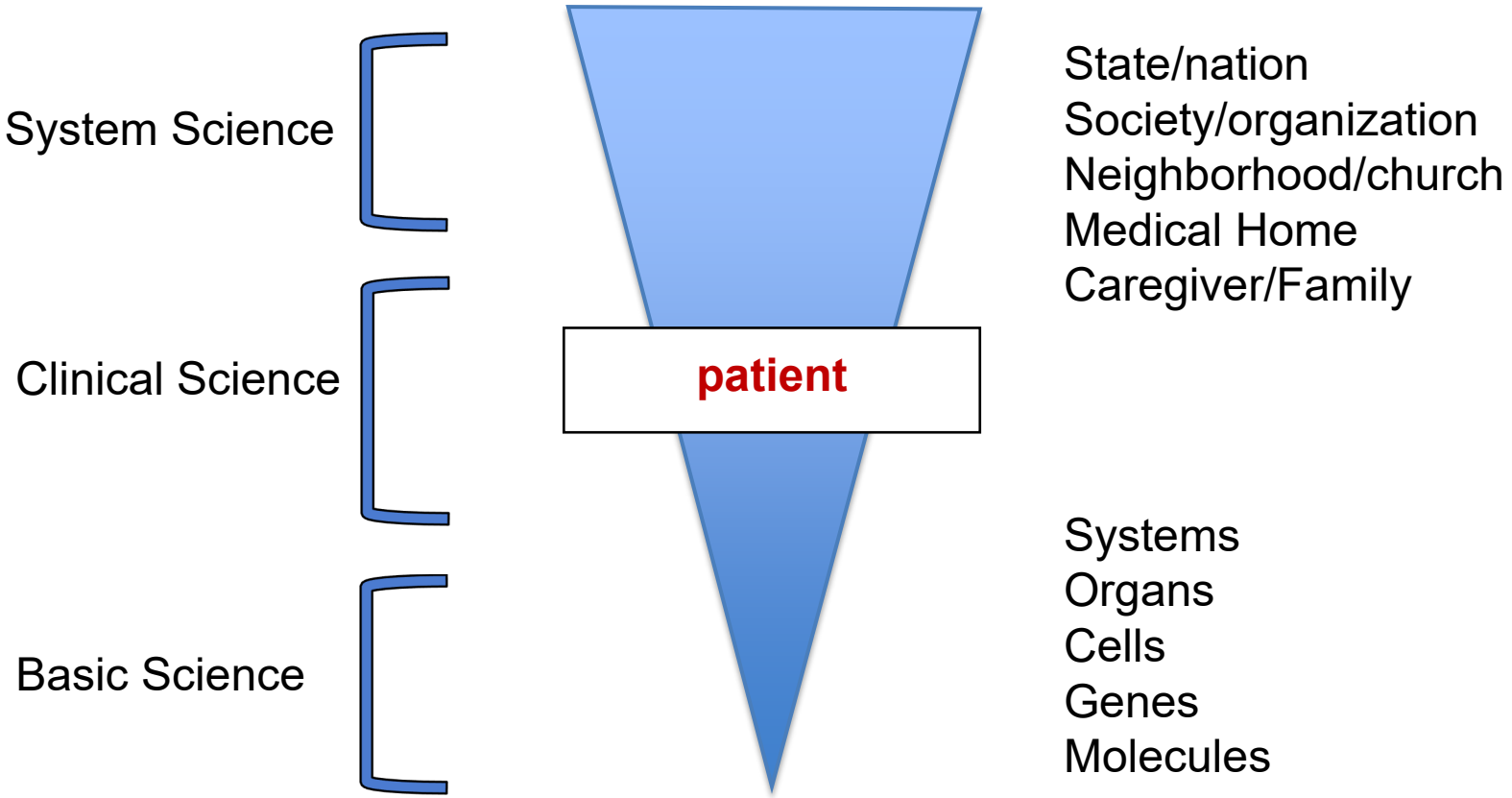
What is the capability we must create?



- An internalized ”set point”
- A standard against which learners judge their current performance?
  - “What they did”, not “who they are”.

- A mental model of what expertise and duty look like
- Preclerkship = what does success look like?
- Clinical years = practice across many patients and disciplines

Systems thinki at all levels



After, Pangaro, *JIAMSE,* 2010; Med Sci Ed, 2022

Systems thinking: gluconeogenesis **and** community health

- What the system trying to do? What does success look like?
- What are the inputs?
- What are the intended outputs?
- What's the system trying to maximize, minimize, avoided?
- What are the feedback loops?
- What else in the system influences success?
- What limits success, threats to success?

1. What should a student bring to the situation?

Duty : learned through early patient contact

Expertise: Most (25%) of the explainable variance in ratings in student clerkship performance in the RIME scheme was explained by preclerkship GPA

Durning, Acad Med, 2004

2.What should faculty bring to the clerkship situation?

Trust, clear expectations, feedback

Invitation in the Preclerkship Curriculum

- *"What are some pathophysiologic mechanisms that might explain this patient's findings?"*

- *"What are some social mechanisms that might explain this patient's findings?"*

Curriculum as an Invitation in this setting

- For clerkship students, curriculum should be an invitation to interpret.

- *"What are three possible factors that explain your patient's problem?"*

Professionalism:
a promise of expertise and
a promise of duty

The promise is made to the patient

Not to the teacher, the test or the health care system

Summary recommendations – policy and strategy

- Students: see curriculum as a process
  - Internalize what a promise of expertise and duty look like
  - Invitation to progress
- Faculty
  - Support and trust, clarity in expectations, time for feedback
- Deans/chairs
  - See faculty as key to success

Wrap-up:

What is something that you heard today that you think could apply to your curriculum renewal process?

Please type in the chat.

Thank you

w

louispangaro@aol.com