#### Baylor College of Medicine

### New Horizons Restructuring Basic Sciences Beyond USMLE.



### Presenters



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### Objectives



**Discuss** the challenges and opportunities of integrating basic science education in the context of changes to USMLE Step 1 scoring.



**Define** the roles of faculty in designing and implementing timely basic science education that underpins foundational thinking.



**Demonstrate** how basic and clinical sciences can be interwoven using spiral integration and focused exposures to basic science concepts.

# CURRICULAR TRENDS

at as as an art

#### In 2018, Baylor College of Medicine School of Medicine embarked upon curriculum renewal ... we were not alone.

#### Curriculum Change in US Medical Schools: Implementation of Change in 2017-2018



Most Curriculum Changes are targeting the foundational pre-clerkship phase. Curriculum Change in US Medical Schools: Location of Change in 2017-2018



Serves as basis of critical thinking and clinical problem solving.

### What is the value and role of... foundational sciences?

Enables understanding of normal homeostasis, its disruption and management.

Requires a fund of knowledge to base hypothetical possibilities and take action.

Chaney S et al, *JIAMSE*, 2010 Finnerty EP, *JIAMSE*, 2010 Pangaro L, *JIAMSE*, 2010

Curriculum Change in US Medical Schools: Types of Change in 2017-2018



Curriculum Reports | AAMC

Most schools are still working to achieve aims 100 years after Flexner report.

Gwee et al JIAMSE, 2010

### With changes to Step 1 the goal is not to cut content **but to better integrate**.

Emphasis on foundational thinking and clinical relevance.

Providing application or action opportunities for foundational sciences.

USMLE Website <u>http://www.usmle.org/</u> Pangaro L, *JIAMSE*, 2010 Majority of medical practice is routine with cases based on pattern recognition.

#### How and why are we **'shortening'** the basic sciences?

Expert physicians do rely on understanding of basic sciences for difficult cases.

Expert physicians require a strong foundational sciences background in order to write and deviate from guidelines.

> Woods NN et al, *Adv in Health Sci Education*, 2007 Pangaro L, *JIAMSE*, 2010

# CURRICULAR CHALLENGES

# The first step to meaningful integration is... accountability

Baylor College of Medicine shortened the foundational curriculum to 18 months.

Major barriers to horizontal and vertical integration.

**Strong central oversight** was a first step to address integration.

Khan et al., BMC Med Educ. 2019

Over time... integration of foundational into clinical content unravels.



Khan et al., BMC Med Educ. 2019



Clinical relevance of foundational sciences through integrated experiences.

Focused foundational sciences in first year then threaded throughout clinical curriculum.

Early decision to integrate basic sciences throughout four years.

### **Embarked on Curriculum Renewal**

We are using Understanding by Design (UbD) to... shift into a new alignment.

Intended curriculum Implemented curriculum

# CURRICULAR RESET

**Start with the end in mind-** what is worth understanding?

### UbD is well-suited to... Competency-Based Medical Education (CBME).

**Assess for understanding-** what is acceptable evidence?

**Design learning experiences** to teach for transfer.

Frank, Snell et al, *Med Teacher*, 2010 Joyce & Swanberg, *AMERE*, 2017 Wiggins & McTighe, 2005

**Essential understandings** basic to the practice of medicine.

# UbD has helped us clarify....

**'Assessment for learning'** that embraces individual student challenges.

**Integration mechanism** for tracking alignment of curriculum.

Brauer & Ferguson, *Med Teach* 2015 Joyce & Swanberg AMERE, 2017

### **Integrated Framework**



**Metacognition** 

#### **Foundational Principles**

Principles of health and disease framework **Transitions to Medical School** *"Why?"* 

### **Integrated Framework**

#### **Foundational Thinking**

Integrated systems framework Applied Foundational Sciences *"How?"* 

#### **Foundational Principles**

Principles of health and disease framework Transitions to Medical School *"Why?"* 



### **Integrated Framework**

#### **Integrated Experiences**

Discovery of new knowledge Applied Foundational Sciences "What can I do ...?"

Foundational Thinking Integrated systems framework Applied Foundational Sciences *"How?"* 

#### **Foundational Principles**

Principles of health and disease framework Transitions to Medical School *"Why?"* 



**Clinical Sciences** 

Our integrated framework is driven by... curricular threads

Brauer D & Ferguson K, *Med Teach*, 2015 Hawkins Ret al, *Med Educ*. 2015 Pangaro L, *JIAMSE*, 2010



Threading of instruction and assessment encourages foundational thinking.

Brauer D & Ferguson K, *Med Teach*, 2015 Pangaro L, *JIAMSE*, 2010



## Threading starts with the end in mind.

Brauer D & Ferguson K, *Med Teach*, 2015 Pangaro L, *JIAMSE*, 2010 Wiggins & McTighe, 2005 **Show** rational prescribing within a simulated/real-world context.

Know how to select drug based on patient-related factors.

Know how to select drug within an evidence-based context.

**Know how** drugs act within pathophysiological contexts.

Know how drugs interact with receptors.

Know receptors are proteins.

Know protein structure and function.

Pharmacology

Baylor College of Medicine to innovate.

Foundational sciences are essential for clinical-reasoning and decision-making.

**Changes to USMLE** are an opportunity

Understanding by Design is well suited to competency-based medical education.

**Questions?**