

Slide 1

BCH Academy for Teaching and Educational Innovation and Scholarship:  
**Microbursts of Educational Principles and Theories**

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Kathleen Huth, MD, MMSc  
Erica Lee, PhD  
Mary McLellan, MPH, BSN, RN, CPN, CPH  
Meghan Sullivan, MSW, LICSW



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Slide 2

Disclosures

- The speakers do not have any financial relationships to disclose.

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Slide 3

Learning Objectives:

*By the end of this session, participants will be able to:*

- ☐ Examine 5 core educational principles and theories
- ☐ Reflect on how core principles and theories inform best teaching practices
- ☐ Use core principles and theories to solve examples of clinical teaching (and life) challenges

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Slide 4

### Educational theory—*why should I care?*



Reveals how learners perceive, process and apply new information



Helps us design teaching sessions to optimize learning

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Slide 5

### Micro-Bursts

- Adult Learning Principles
- Self-Determination Theory
- Growth Mindset
- Cognitive Load
- Deliberate Practice

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Slide 6

### Adult Learning Principles

Kathleen Huth, MD, MMSc  
Complex Care Service, Boston Children's Hospital

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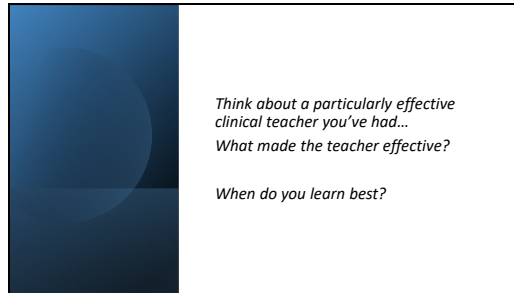
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Slide 7



*Think about a particularly effective clinical teacher you've had...*  
*What made the teacher effective?*

*When do you learn best?*

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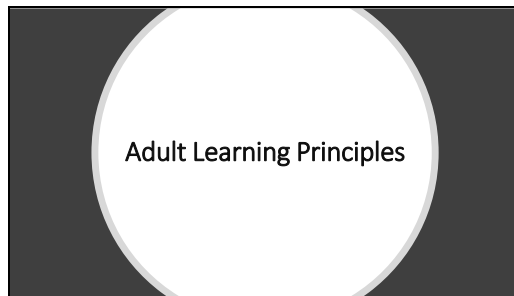
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Slide 8



Adult Learning Principles

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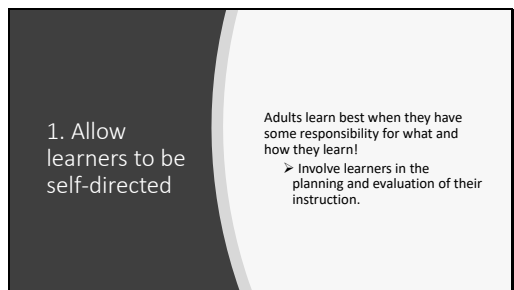
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Slide 9



1. Allow learners to be self-directed

Adults learn best when they have some responsibility for what and how they learn!

- Involve learners in the planning and evaluation of their instruction.

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Slide 10

2. Activate prior experience

*"To children, experience is something that happens to them. To adults, experience is who they are."*  
-Knowles, Swanson , Holton, eds. "The Adult Learner" 2011.

*"The resource of highest value in adult education is the learner's experience... Too much of learning consists of vicarious substitution of someone else's experience and knowledge... Experience is the adult learner's living textbook."*  
-Lindeman 1926

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Slide 11

3. Create relevance

Adults are motivated to learn if it is relevant to real-world situations

- Connect your teaching to your learners' daily practice

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Slide 12

4. Focus on problems, not topics

Adults are goal-oriented and are motivated to use learning to solve problems

- Tailor teaching to help learners with daily challenges

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## Slide 13

Principles	Questions	Approach
Adult learners are <b>self-directing</b> . They learn best when they have some <b>responsibility</b> for what and how they will learn.	<ul style="list-style-type: none"> <li>What are ways you can incorporate opportunities for learners to make decisions about their own learning? (i.e. the type of task, order of activities, what learning goal to focus on)</li> </ul>	
Prior experience shapes who the adult learner is and how he/she approaches problems.	<ul style="list-style-type: none"> <li>What are ways you can "tap in" to learners' experiences? How can you use their experiences as a resource for learning?</li> <li>What are ways you can connect prior experiences and learning with new knowledge?</li> </ul>	
Adults are motivated to learn if it is <b>relevant, practical</b> , and will help them to deal with <b>real-world situations</b>	<ul style="list-style-type: none"> <li>What will the activity enable your learners to do in their regular practice?</li> <li>How will the learning benefit them and help them achieve their goals?</li> </ul>	
Adult learners are <b>goal-oriented</b> and interested in using learning to <b>solve problems</b> , rather than memorizing content	<ul style="list-style-type: none"> <li>What are ways you can make the activity applicable to challenges faced by the learner?</li> <li>How can you present new knowledge and skills in the context of real-world problems?</li> </ul>	

## Slide 14

Principles	Questions	Approach
Allow learners to be <b>self-directed</b>	<ul style="list-style-type: none"> <li>What are ways you can incorporate opportunities for learners to make decisions about their own learning? (i.e. the type of task, order of activities, what learning goal to focus on)</li> </ul>	Provide different ways to participate: breakout, chat, etc. Ask learners: which theory do you want to dive into next?
Activate prior experience	<ul style="list-style-type: none"> <li>What are ways you can "tap in" to learners' experiences? How can you use their experiences as a resource for learning?</li> <li>What are ways you can connect prior experiences and learning with new knowledge?</li> </ul>	Poll at the start: How do you feel about educational theory? How familiar are you with these theories?
Create relevance	<ul style="list-style-type: none"> <li>What will the activity enable your learners to do in their regular practice?</li> <li>How will the learning benefit them and help them achieve their goals?</li> </ul>	Share "why should I care?" Discuss how the session will impact learners' practice as educators
Focus on problems, not topics	<ul style="list-style-type: none"> <li>What are ways you can make the activity applicable to challenges faced by the learner?</li> <li>How can you present new knowledge and skills in the context of real-world problems?</li> </ul>	Translate into practice: ask learners to consider how each principle can be applied to their next teaching session

## Slide 15

### Adult Learning Resources

Knowles M, Swanson RA, Holton EF, eds. The Adult Learner, 7th edition: The definitive classic in adult education and human resource development. Burlington, MA: Elsevier Inc, 2011

Taylor D and Hamdy H. Adult learning theories: Implications for learning and teaching in medical education: AMEE Guide No. 83, Medical Teacher 2013; 35:11 e1561-e1572

Collins J. Education Techniques for Lifelong Learning: Principles of Adult Learning. RadioGraphics 2004; 24:1483-1489

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Micro-Bursts

- Adult Learning Principles
- Self-Determination Theory
- Growth Mindset
- Cognitive Load
- Deliberate Practice

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Slide 17

Self-Determination Theory

Erica Lee, PhD  
Department of Psychiatry  
January 15, 2021

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Slide 18

What is Self-Determination Theory?

- Self-determination: the ability to make choices and control one's life
- Self-Determination Theory (SDT): individuals are intrinsically motivated to grow; growth is facilitated by meeting autonomy, competence and relatedness needs (Deci & Ryan, 1985)

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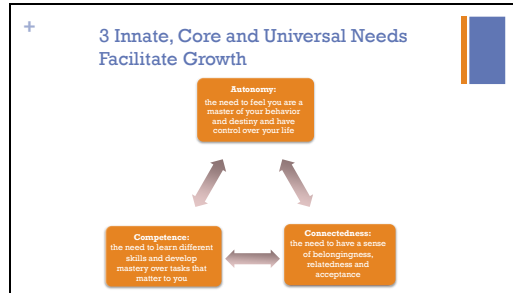
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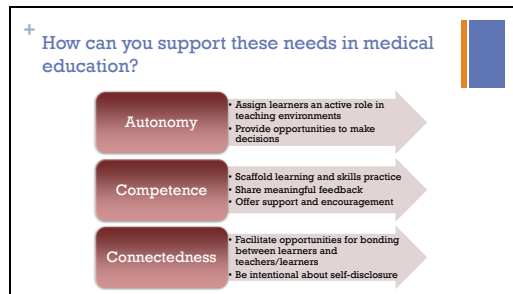
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Slide 21

**Breakout Groups!**

- A learner in your course has seemed disengaged in seminars. He also hasn't completed home practice assignments to apply new clinical skills. You check in with him and find out that he feels unmotivated to participate. He says the material is "over his head," he doesn't have friends in the class, and he dislikes being evaluated as part of a group. He adds that he only comes to seminar because it's required.
- Using Self-Determination Theory, what are some reasons why this learner is struggling? How could you re-engage him?

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When you join the breakout group,  
+ please introduce yourselves by giving  
your first and last name and hospital  
role.

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Slide 23

+ Why is the learner struggling? How can you re-engage him?

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graph TD; A[Increase Autonomy] <--> B[Increase Competence]; A <--> C[Increase Connectedness]; B <--> C;
```

**Increase Autonomy**

- Highlight ability to make decisions and set own goals
- Identify concrete steps to achieve these goals
- Foster a collaborative and curious learning environment

**Increase Competence**

- Emphasize developmental perspective
- Provide positive and non-judgmental feedback
- Identify strengths & areas that learned new skills in the past

**Increase Connectedness**

- Increase opportunities for connection
- Model & encourage "not knowing"
- Discuss past failures

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Slide 24

## Cognitive Load Theory

Mary C McLellan MPH, BSN, RN, CPN, CPH  
Clinical Inquiry Coordinator  
Inpatient Cardiology, Boston Children's Hospital

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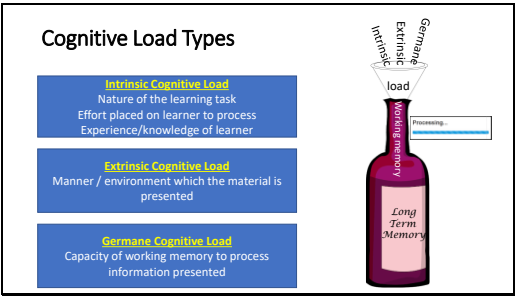
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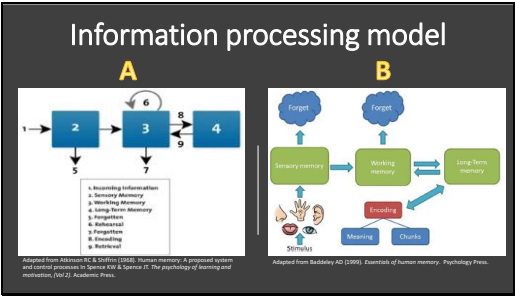
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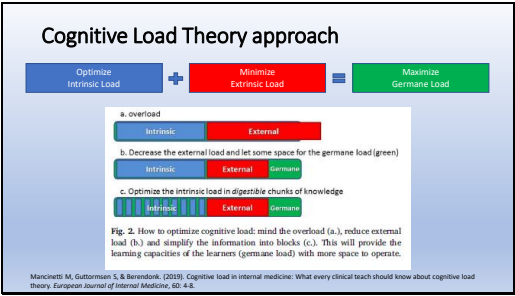
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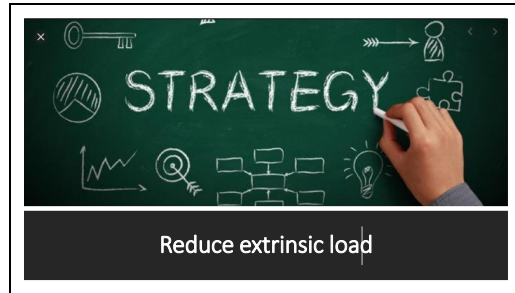
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Slide 27



Slide 28



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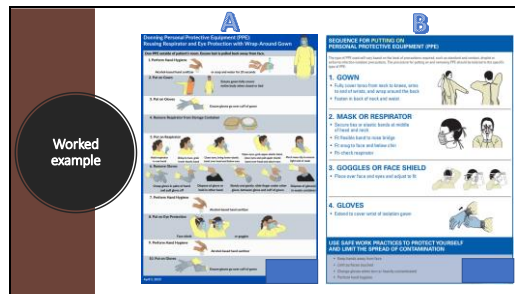
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Slide 30



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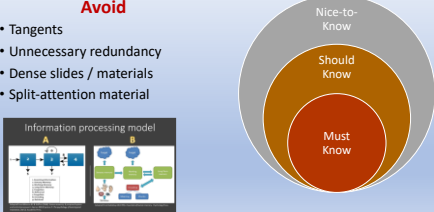
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Slide 31

### Information presentation

**Avoid**

- Tangents
- Unnecessary redundancy
- Dense slides / materials
- Split-attention material



Information processing model

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Slide 32



STRATEGY

Optimize intrinsic load

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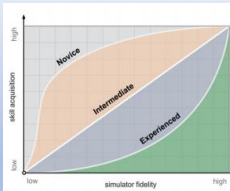
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Isolate elements.  
Move from simple to complex.



### Low vs. high fidelity learning opportunities



Aggarwal R, et al. (2010). Training and simulation for patient safety. *Quality and Safety in HealthCare*, 19(suppl 2): 194-462.

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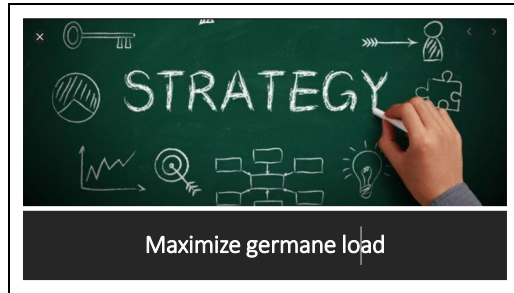
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Reasoning and Instructional Design: Implications for Cognitive Load Training  
Reasoning and Instructional Design: Implications for Cognitive Load Training  
Reasoning and Instructional Design: Implications for Cognitive Load Training

Instructional Design	Cognitive load generally positively affected		
	Declarative	Procedural	Metacognitive
Have early learners complete only proceduralized parts of procedures and not procedural tasks based on learner's skill and anticipated complexity	Yes	Yes	Yes
Make sure quality when early learners are taught and practice concepts	Yes	Yes	Yes
Adjust amount of support provided to learner based on learner's prior experience and complexity of procedure	Yes	Yes	Yes
Provide sufficient procedural skills to learner	Yes	Yes	Yes
Use indicators for early procedural learners	Yes	Yes	Yes
Observe when performing procedures	Yes	Yes	Yes
Make adjustments in response to learner outside of actual procedures	Yes	Yes	Yes
Monitor when it comes to learner	Yes	Yes	Yes
Consider target number of procedures a learner should perform in one session	Yes	Yes	Yes
Ensure that supervisor manages assessment to keep a consistent learning	Yes	Yes	Yes
Ensure that supervisor remains engaged with procedure and learner	Yes	Yes	Yes
Ensure that supervisor keeps learner engaged when delivery procedure	Yes	Yes	Yes
Ask learners to think or explain what steps, rather than immediately asking them what to do	Yes	Yes	Yes

Abbreviations: D indicates declarative load; P, germane load; M, metacognitive load

Stewart, J., et al. (2017). Learner, patient, and supervisor features are associated with different types of cognitive load during procedural skills training: Implications for teaching and instructional design. *Academic Medicine*, 92(10), 1622-1631.

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Slide 37

# Growth Mindset

Meghan Sullivan, MSW, LICSW

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Slide 38



## Growth vs. Fixed Mindset

Fixed Mindset	Growth Mindset
"I can either do it or I can't"	"Failure is an opportunity to grow"
"When I'm frustrated I give up"	"I can learn to do anything I want"
"I don't like to be challenged"	"Challenges help me grow"
"I take feedback and criticism personally"	"Feedback is constructive"



Slavin, C. (2002). What Works? "Growth Mindset". Society for Research in Child Development. Retrieved from <http://www.societyforresearchinchilddevelopment.org/what-works/growth-mindset>

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Slide 39

## Teacher Bias



- We all have biases!
- Racial disparities are well documented in healthcare and medical education.



- How do you think about your students/learners individually?
- You can change your behavior in an active effort to give every student the chance they deserve to learn.
- The important first step is acknowledging that you hold biases.

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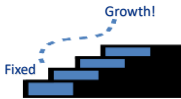
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Slide 40

### Reframe Feedback

- Reward not just effort but learning and progress
- Celebrate your learner's growth
- Emphasize learning well over learning quickly
- Reward actions instead of traits
- Abandon the idea of succeeding on talent alone; recognize that it will always take hard work as well!



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### Breakout Groups

- When you join the breakout group please introduce yourselves by giving your first and last name, as well as your role within the hospital.



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Slide 42

### Deliberate Practice

Microburst of Education Theory

Denise Downey MSN, RN-BC, CPEN

1/12/21



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Slide 43

### Deliberate Practice


What is it?

- Strategy to develop expertise with a skill or procedure
- Purposeful, systematic, intentional and repetitive practice
- Regular, informed feedback from instructor/expert
- Repeated cycles of focused practice and self-editing
- Self-reflective feedback loop
- Expert performance is the result of expert practice

Examples - Music, sports

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Slide 44


### Deliberate Practice

From the Learner:

- Significant personal effort to initiate and maintain
- High repetition with immediate feedback
- Going slow but going correctly
- Self-regulation, intense concentration
- Short term goals, long term target
- Evaluation of the process and how to improve
- Push outside of comfort zone (avoid mindless automation)

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Slide 45

### Deliberate Practice

Educators - Why do this?

- Accelerate learner's professional growth
- Reach learner's potential
- Learner becomes the expert
- Promotes growth mindset

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Slide 46

### Deliberate Practice Key Concepts

1. Identify task/goal
2. Incorporate existing knowledge
3. Break large tasks into smaller ones to reduce cognitive load
4. Repetitive practice outside of comfort zone
5. Regular feedback from effective coach/expert
6. Celebrate small successes
7. Practice alone, allow for self-reflection, self-correction
8. Correct deficiencies and try again!

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### Deliberate Practice


To be successful:

- Invest time
- Humility to learn and incorporate feedback
- Passion to excel
- Belief in ability to succeed

**Expert performance is the result of expert practice**

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Slide 48

### Deliberate Practice

As educators, how can we apply it?

Task:


Teach a novice how to place a peripheral IV using concepts of Deliberate Practice

Extra Credit:

What other educational principles that we learned today could apply to this scenario?

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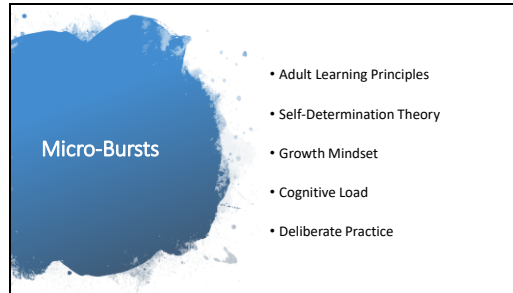
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Micro-Bursts

- Adult Learning Principles
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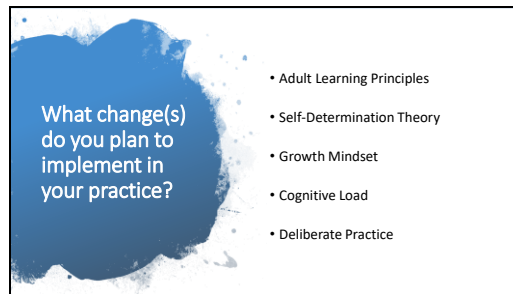
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Slide 50



What change(s)  
do you plan to  
implement in  
your practice?

- Adult Learning Principles
- Self-Determination Theory
- Growth Mindset
- Cognitive Load
- Deliberate Practice

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Slide 51



**Thank you!**

Denise Downey MSN  
Kathleen Huth, MD, MMSc  
Erica Lee, PhD  
Mary McLellan, MPH, BSN, RN, CPN, CPH  
Meghan Sullivan, MSW, LICSW

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