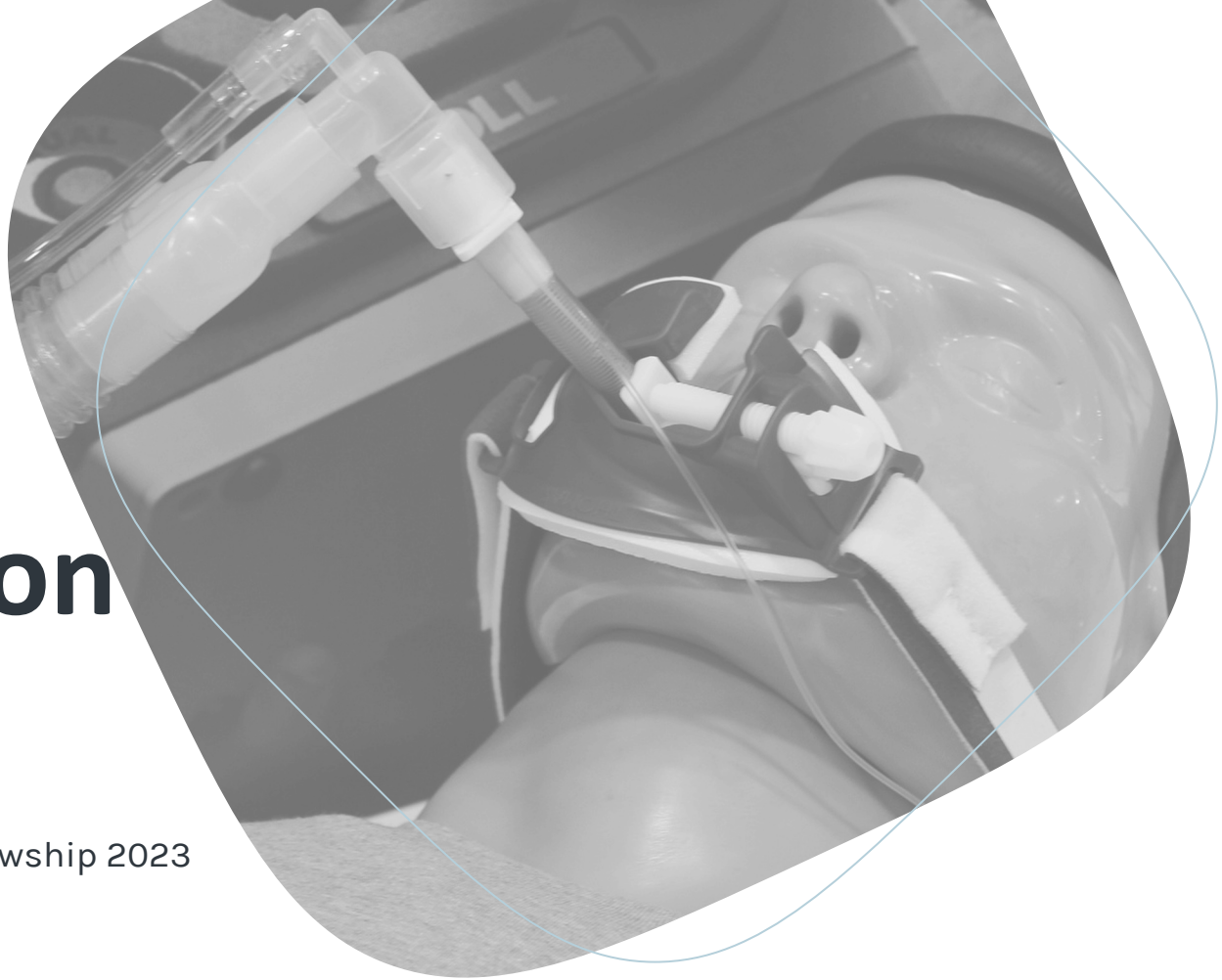


Simulation

Dr. Jessica Fujimoto, MD

ACEP/CORD Teaching Fellowship 2023



Hello!





This talk is...

Meant to draw on pre-existing knowledge of MedEd theory and curriculum design

Focused on the two main facets of simulation education that deserve special consideration:

Design

Debriefing

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Meant to draw on pre-existing knowledge of MedEd theory and curriculum design

Focused on the two main facets of simulation education that deserve special consideration:

Design

Debriefing

- ☒ **NOT** going to discuss the flow of simulation cases
- ☒ **NOT** going to address new simulation technology
- ☒ **NOT** going to be picky about sim nomenclature



Objectives

Course Design:

- Consider stakeholders' interests when identifying need for curriculum, including KPIs and ROI
- Apply curriculum development principles to draft a simulation curriculum
- Apply cognitive load theory via Sim Zones framework to simulation curriculum

Debriefing:

- Practice debriefing skills using either PAAIL cognitive aid or PEARLS framework
- Evaluate others' debriefing using either PAAIL cognitive aid or PEARLS framework

Objectives

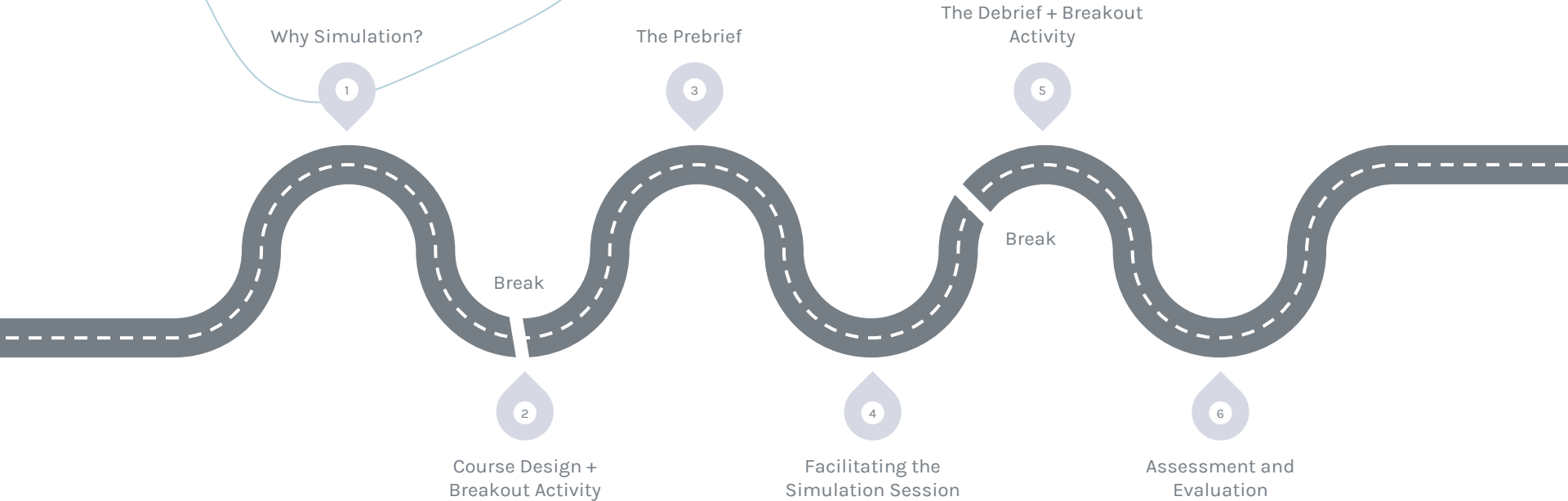
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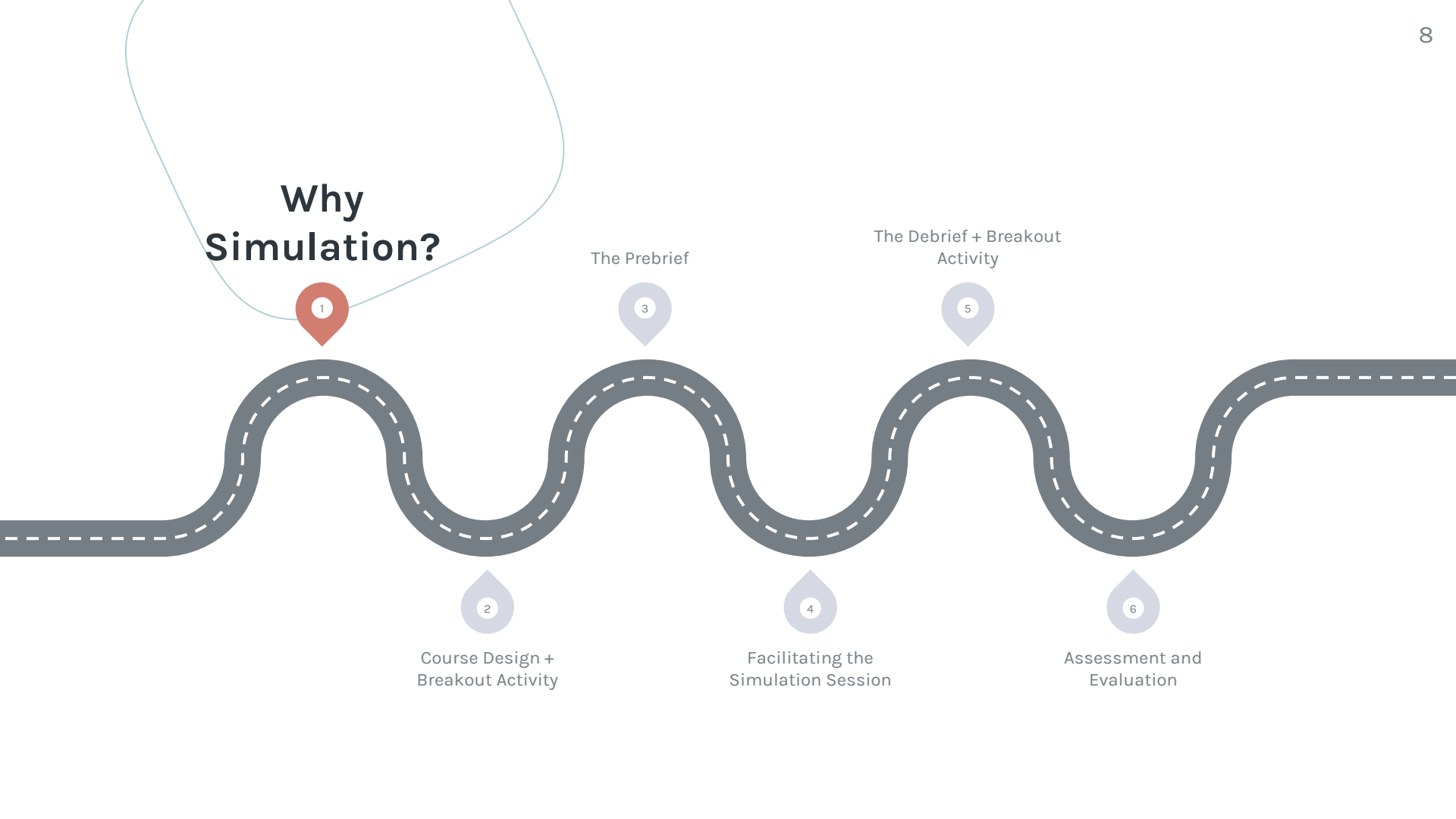
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Roadmap for this afternoon



Why Simulation?



1

3

5

2

4

6

The Prebrief

The Debrief + Breakout Activity

Course Design + Breakout Activity

Facilitating the Simulation Session

Assessment and Evaluation

Why Simulation?

- Patient safety

ORIGINAL INVESTIGATION

Use of Simulation-Based Education to Reduce Catheter-Related Bloodstream Infections

Jeffrey H. Barsuk, MD; Elaine R. Cohen, BA; Joe Feinglass, PhD; William C. McGaghie, PhD; Diane B. Wayne, MD



CHEST

Original Research

EXPERIENTIAL LEARNING

Simulation-Based Education Improves Quality of Care During Cardiac Arrest Team Responses at an Academic Teaching Hospital*

A Case-Control Study

Diane B. Wayne, MD; Aashish Didwania, MD; Joe Feinglass, PhD; Monica J. Fudala, BA; Jeffrey H. Barsuk, MD; and William C. McGaghie, PhD

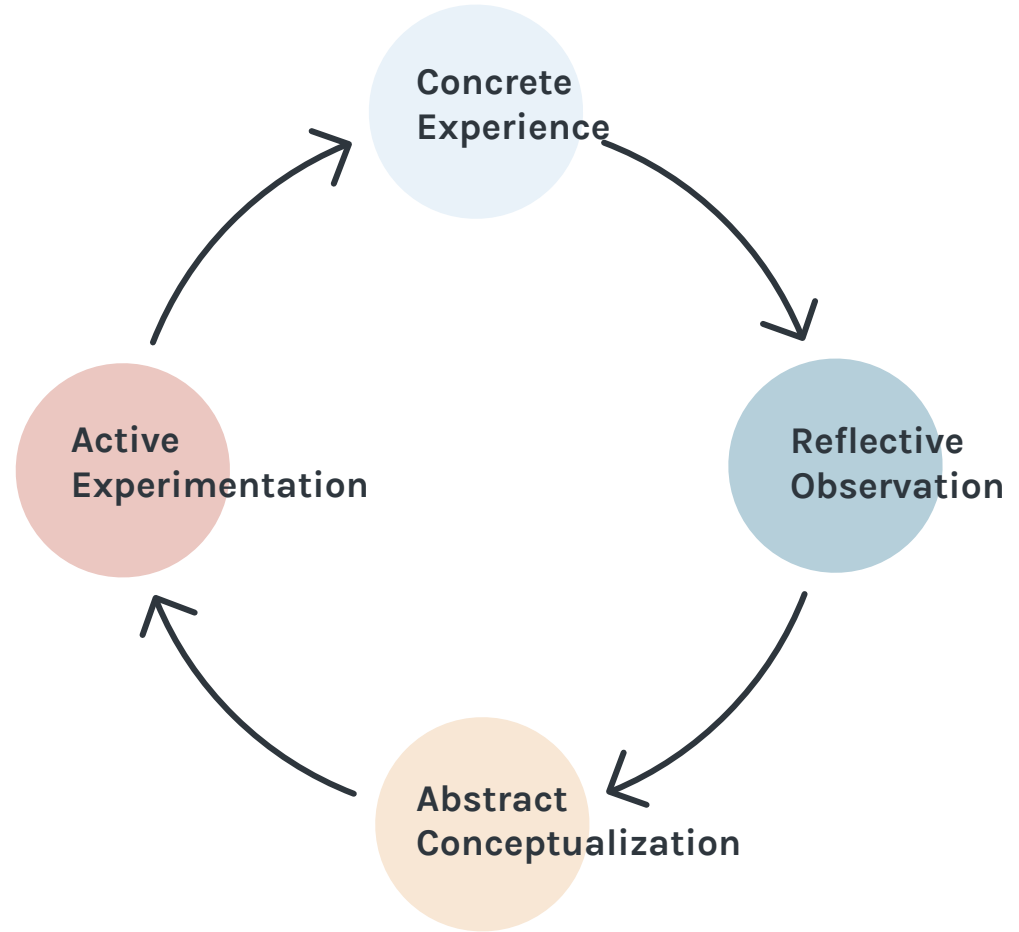
Why Simulation?

- Patient safety
- Institutional benefits



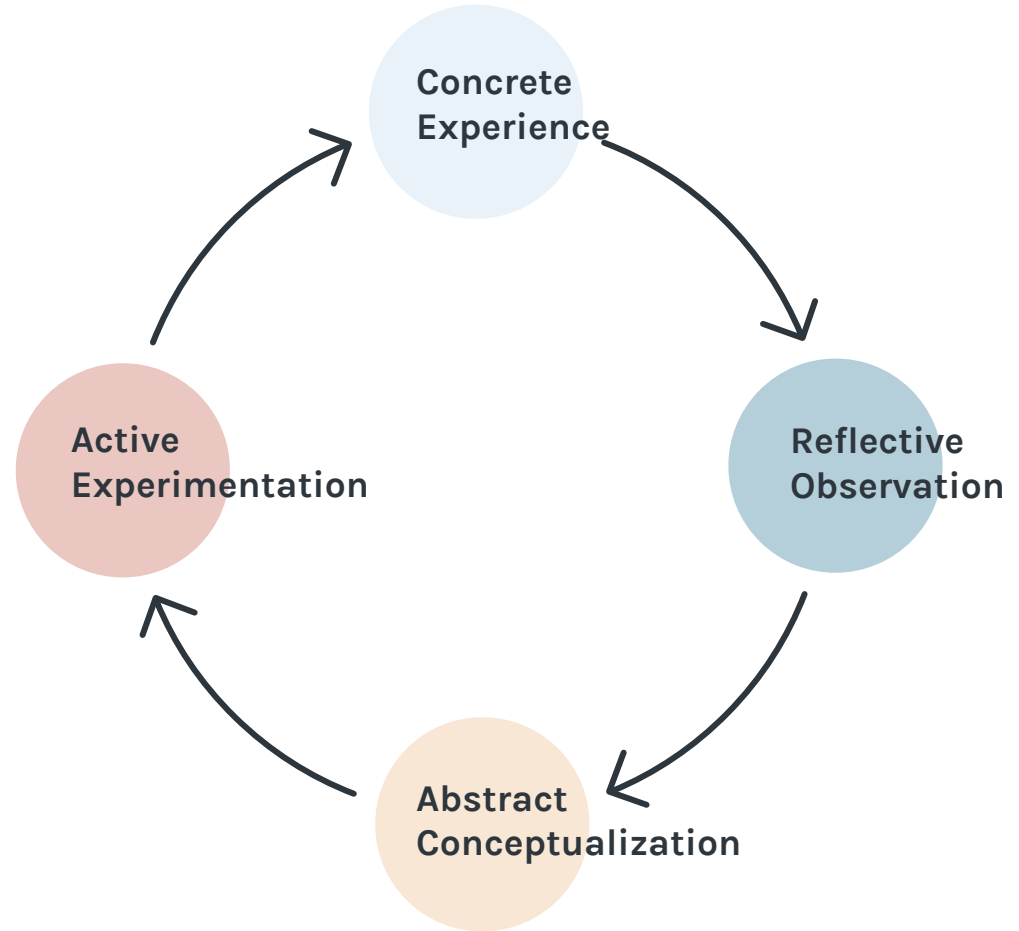
Why Simulation?

- Patient safety
- Institutional benefits
- Learner benefits



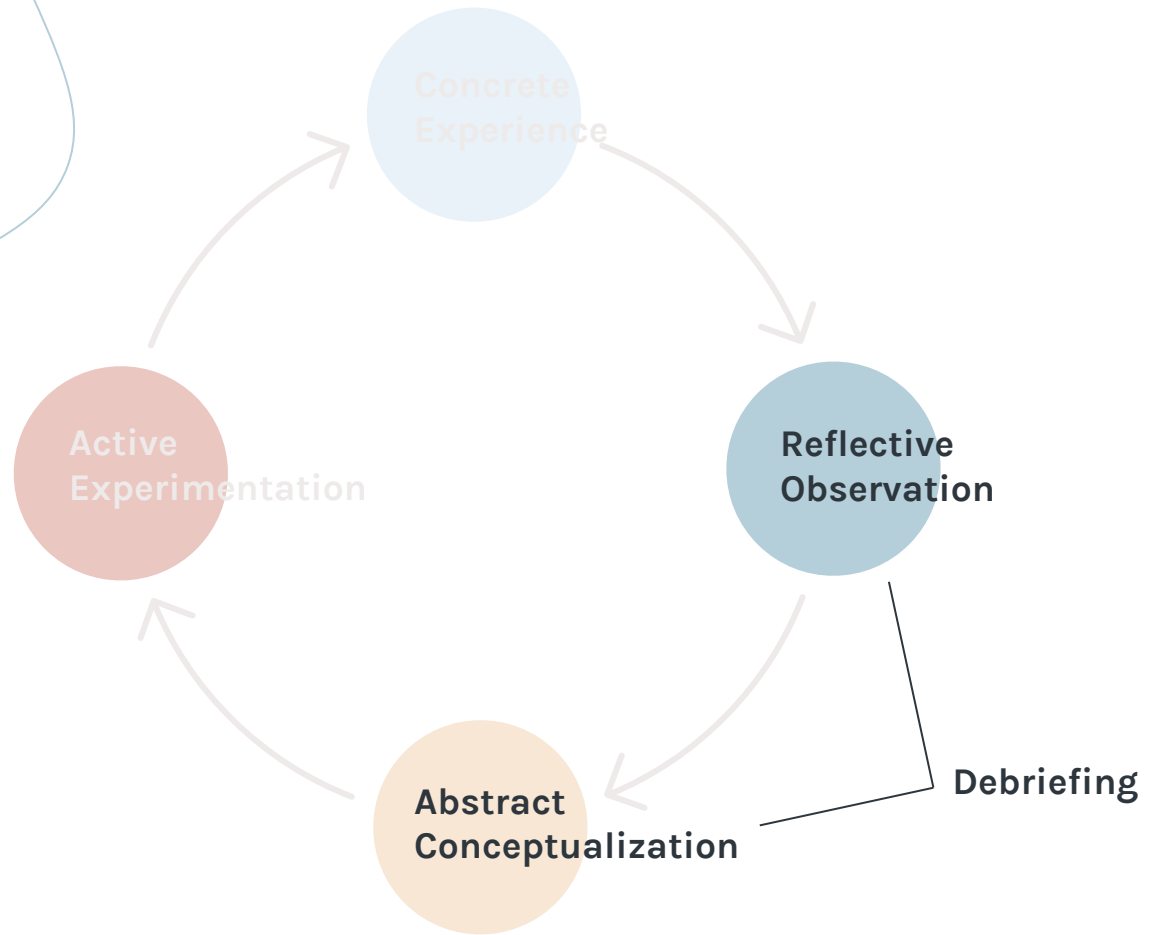
Kolb's Theory of Experiential Learning

explains the
effectiveness of
Simulation
Education



Kolb's Theory of Experiential Learning

explains the
effectiveness of
Simulation
Education



**Simulation Is NOT
always the best
educational
strategy**

Simulation is resource intensive:

\$

Faculty time and skill

Space

Equipment

Take-home Points

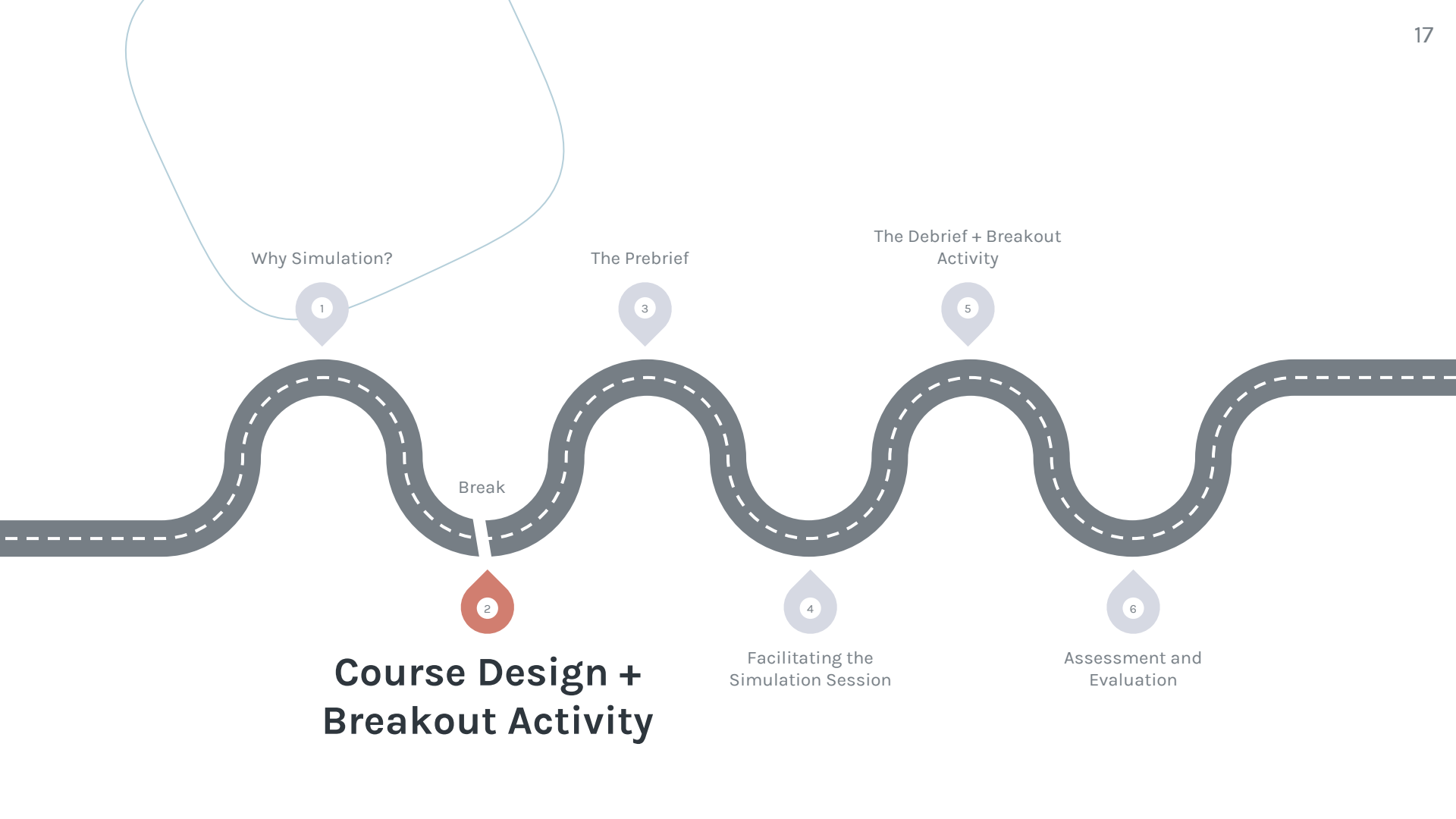
Why Simulation?



1

- Simulation education promotes **patient safety**, benefits the whole **institution**, and is an educational strategy that effectively **promotes learning via Kolb's Theory of Experiential Learning**
- Simulation is very resource-intensive, so its use should be intentional





Why Simulation?

1

The Prebrief

3

The Debrief + Breakout Activity

5

Break

2

Course Design + Breakout Activity

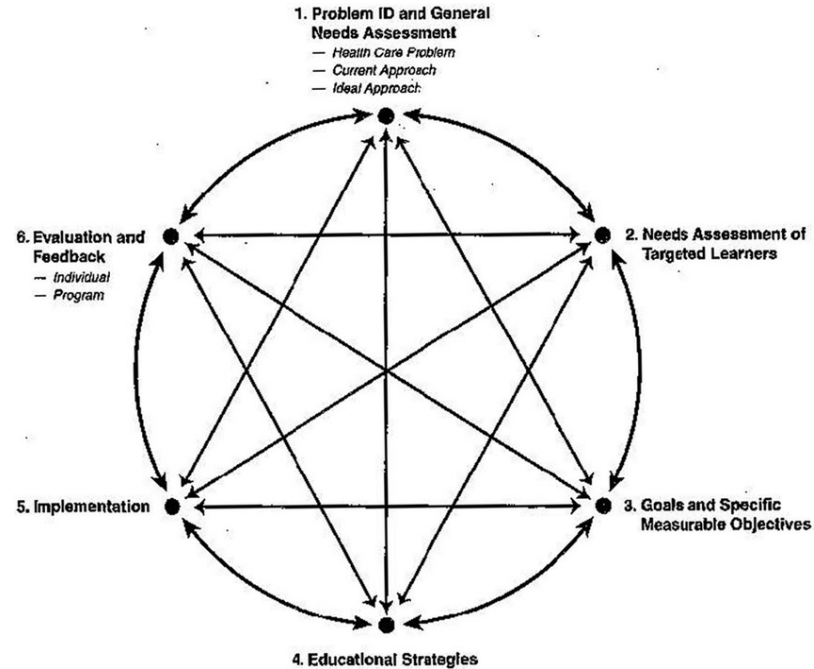
Facilitating the Simulation Session

4

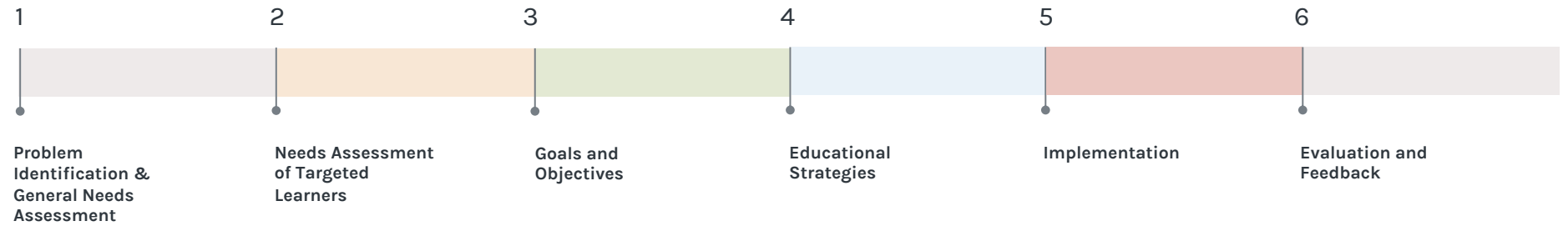
Assessment and Evaluation

6

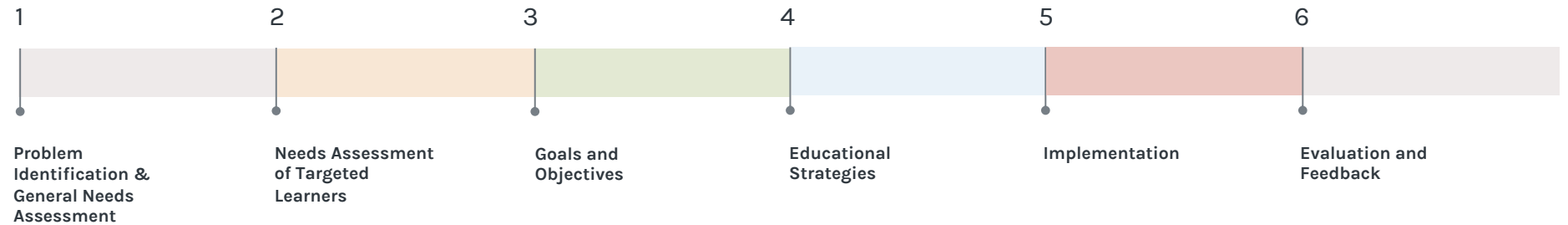
Remember Kern's?

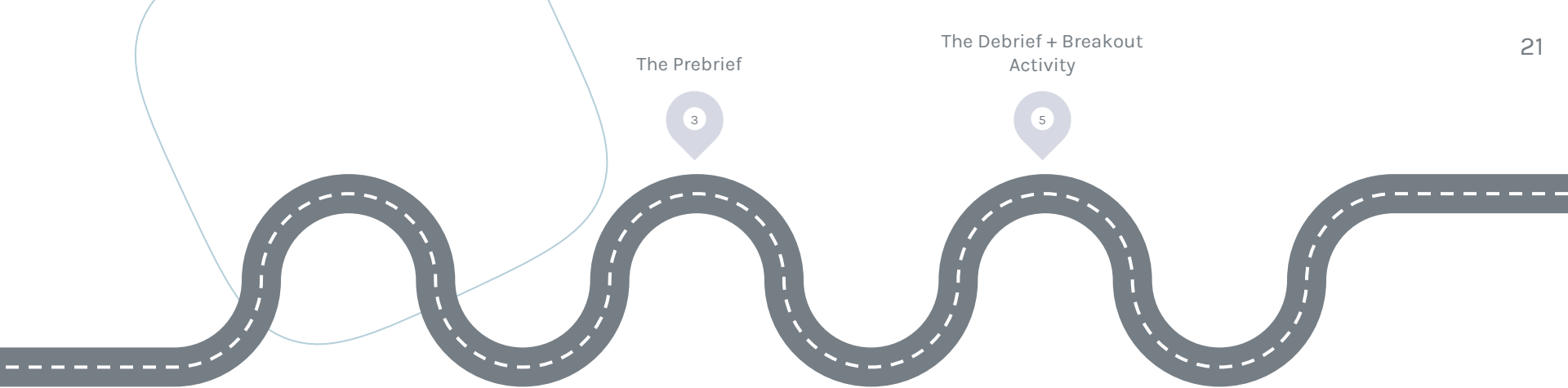


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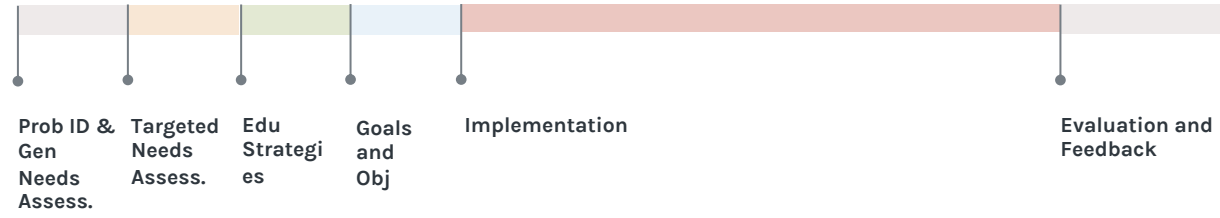


You can apply Kern's 6 steps to a simulation curriculum.

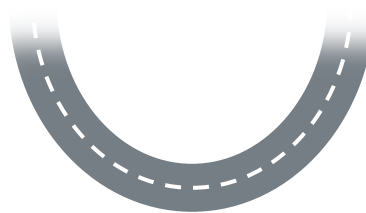




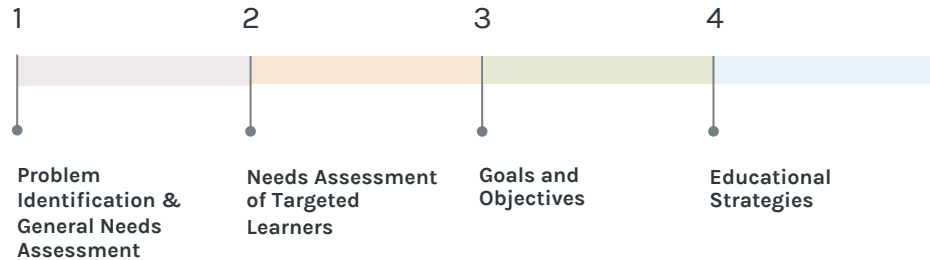
- 1. Problem Identification and Needs Assessment
- 2. Course Design + Breakout Activity
- 3. The Prebrief
- 4. Facilitating the Simulation Session
- 5. The Debrief + Breakout Activity
- 6. Assessment and Evaluation



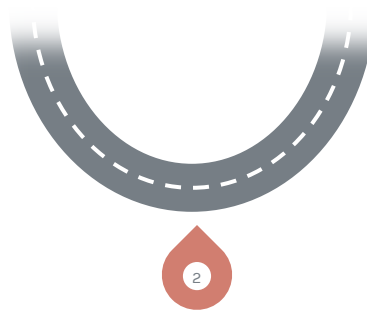
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Course Design +
Breakout Activity



Course Design | Problem Identification & Needs Assessment



Course Design +
Breakout Activity



Course Design | Problem Identification & Needs Assessment

What is an important issue in your department?
What is the gap?
What risks are created by this gap?

Key Performance Indicators

Stakeholders

Vision:

Gap:

Risks:

Course Design | Problem Identification & Needs Assessment

What is an important issue in your department?
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Key Performance Indicators

Stakeholders

Vision: Prepare PGY2 EM residents to care for critically-ill ED patients during COVID19 pandemic

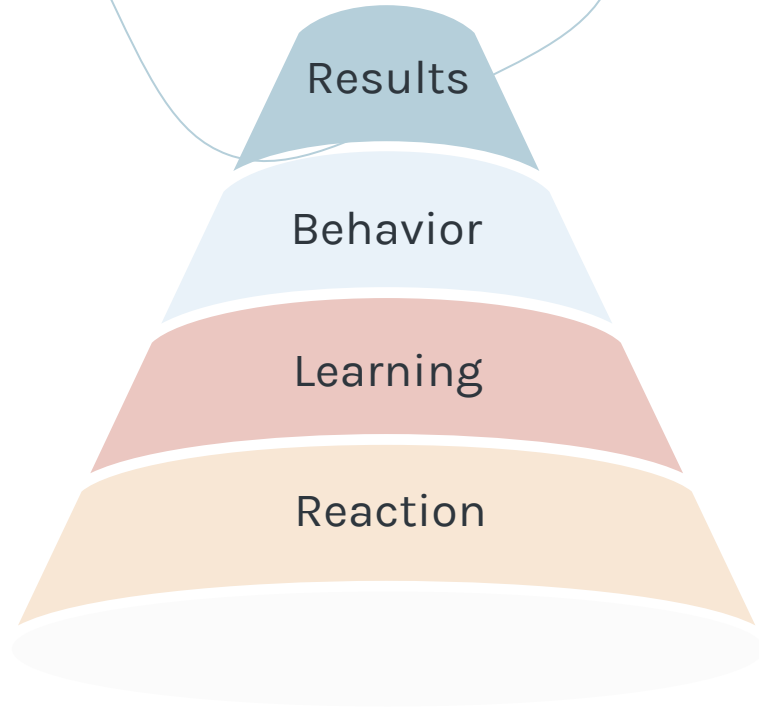
Gap: No formal training regarding infection control during intubation. No formal training on evolving best practices of care of COVID19 patients with respiratory failure. No formal training on institutional systems (e.g. STEMI activation, stroke alert, etc)

Risks: Residents exposed to COVID19 during intubation and become ill. Adverse patient outcomes. Missed metrics (time to tPA, time to balloon).

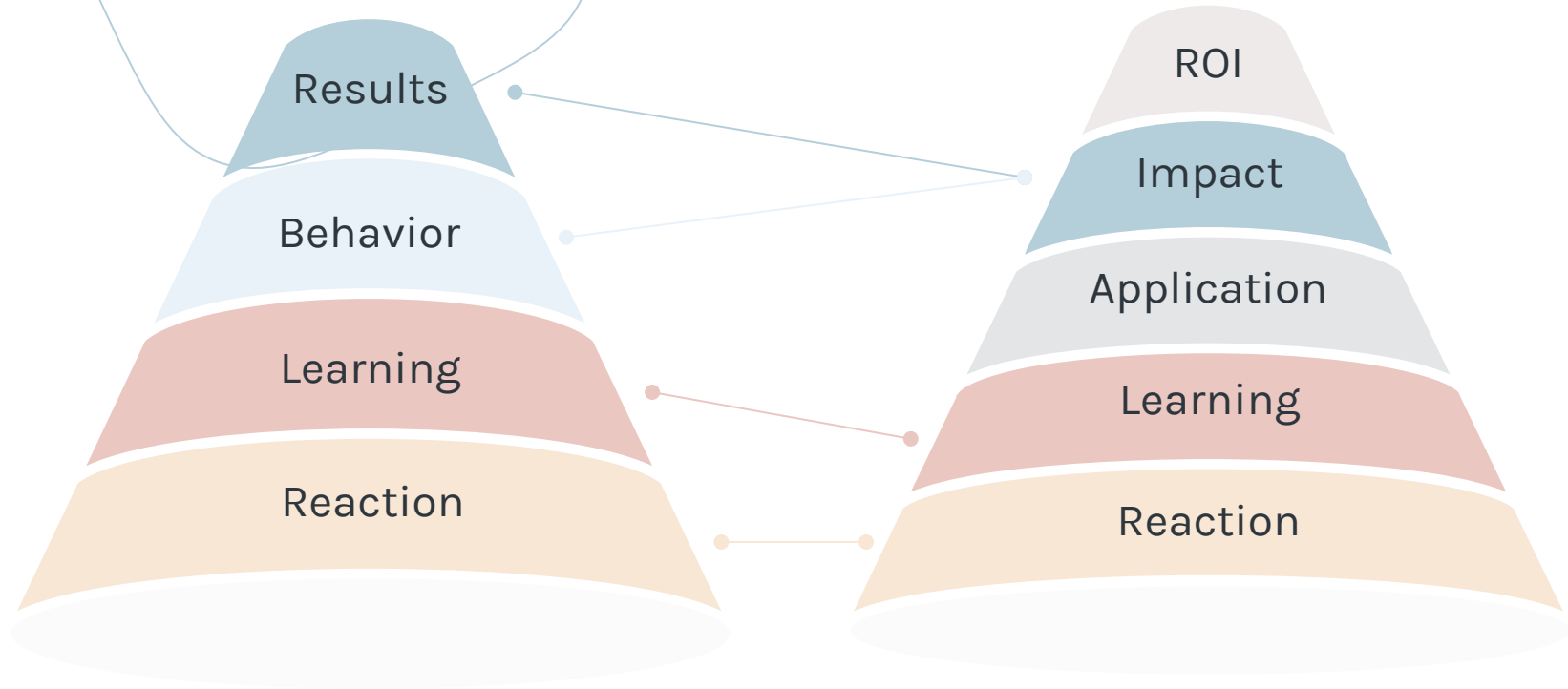
Adapted from



Use Kirkpatrick's Model to frame your KPIs



Use Kirkpatrick's Model to frame your KPIs



Course Design | Problem Identification & Needs Assessment

What is an important issue in your department?

What is the gap?

What risks are created by this gap?

Key Performance Indicators

Stakeholders

Reactions:

Vision:

Learning:

Gap:

Application:

Risks:

Impact/Results:

ROI:

Adapted from



Course Design | Problem Identification & Needs Assessment

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Reactions: survey residents re: feeling of preparedness/ confidence

Learning: post-intervention quiz

Application: # of sessions, # of participants

Impact/Results: Resident illness linked to COVID19 exposure during intubation, patient mortality, missed STEMI/CVA/sepsis metrics

ROI: prevent loss of hospital funding,

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ROI: prevent loss of hospital funding,

Residency program director, faculty member overseeing didactic conference, nursing leadership, simulation faculty, residents, hospital C-suite, simulation technicians, Chair of EM, respiratory therapy

Course Design | Problem Identification & Needs Assessment

What is an important issue in your department?
What is the gap?
What risks are created by this gap?

← Aka current approach

Vision: ←

Aka ideal approach

Gap:

Risks:

Course Design | Problem Identification & Needs Assessment

What is an important issue in your department?
 What is the gap?
 What risks are created by this gap?

Key Performance Indicators

Stakeholders

Reactions:

Vision:

Learning:

Gap:

Application:

Risks:

Impact/Results:

ROI:

Take-home Points



Course Design



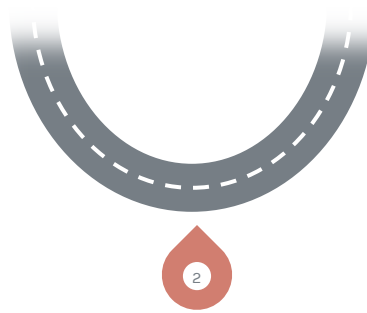
Problem
Identification &
General Needs
Assessment

Needs Assessment
of Targeted
Learners

- The first four of Kern's six steps apply to designing a simulation course.
- Ensure that your investment in developing this simulation curriculum is worthwhile by **thinking about KPIs and stakeholders early** in the process
- Use Kirkpatrick's Model to frame KPIs



Course Design | Goals and Objectives



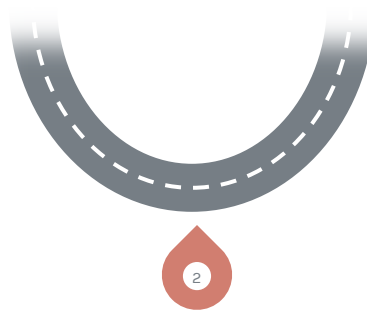
Course Design +
Breakout Activity



Simulation utilizes higher cognitive levels (Bloom's Taxonomy)



Course Design | Educational Strategies



Course Design +
Breakout Activity



Break goals down into microskills in a readiness plan

Think about your simulation curriculum as targeting three areas for readiness:

Building skills. + Applying skills to key situations + Continuous development of people, teams, and systems = Continuous readiness

Example readiness plan

The winning basketball readiness plan

Building skills. + Applying skills to key situations + Continuous development of people, teams, and systems = Continuous readiness for winning basketball games

- Passing skills
- Dribbling skills
- Shooting skills
 - Layups
- Defense skills
- Conditioning
- Communication skills

- Zone defense
- Pick and roll defense
- Offensive plays
 - Give and go

- Walking through plays
- Scrimmage (5 on 5)
- Video review with debrief
- Debriefing after games and practices

Break goals down into microskills in a readiness plan

The _____ readiness plan

Building skills. + Applying skills to key situations + Continuous development of people, teams, and systems = Continuous readiness for _____

• _____

• _____

• _____

Adapted from



Course Design Activity

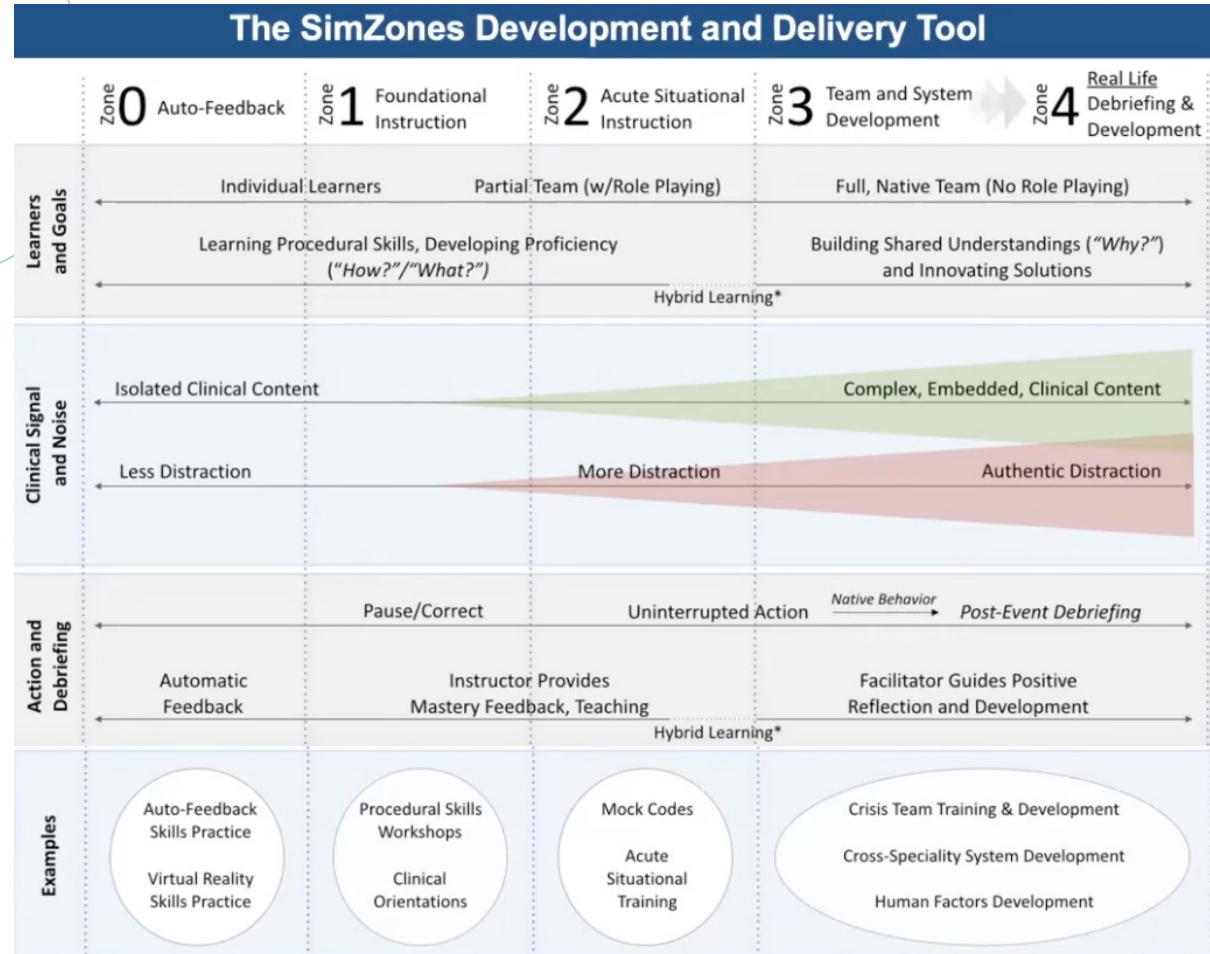
Open shared Google Slide template
(link in dropbox)

Spend 15min drafting a “readiness
plan” for your project

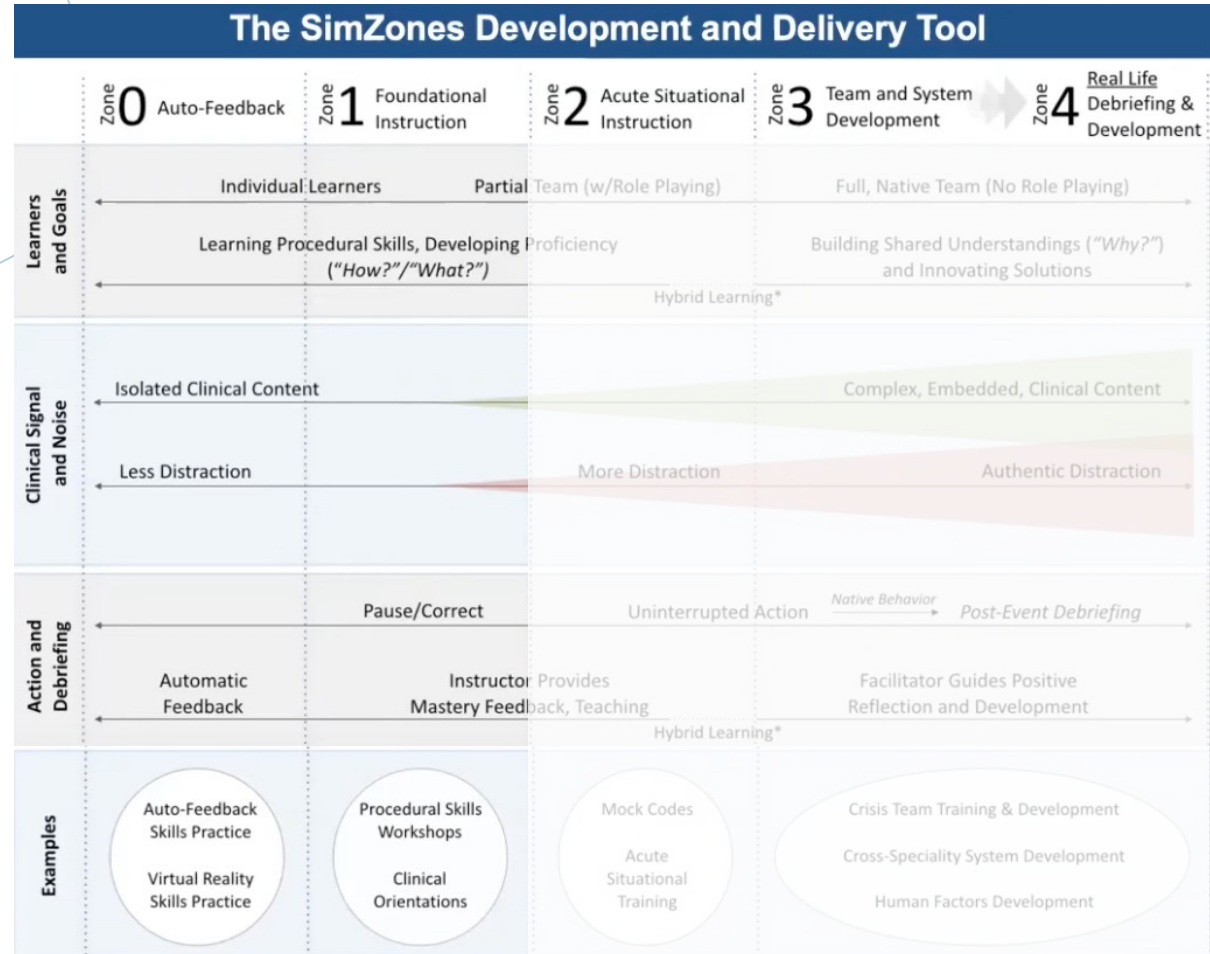
We’ll regroup and review the
readiness plans



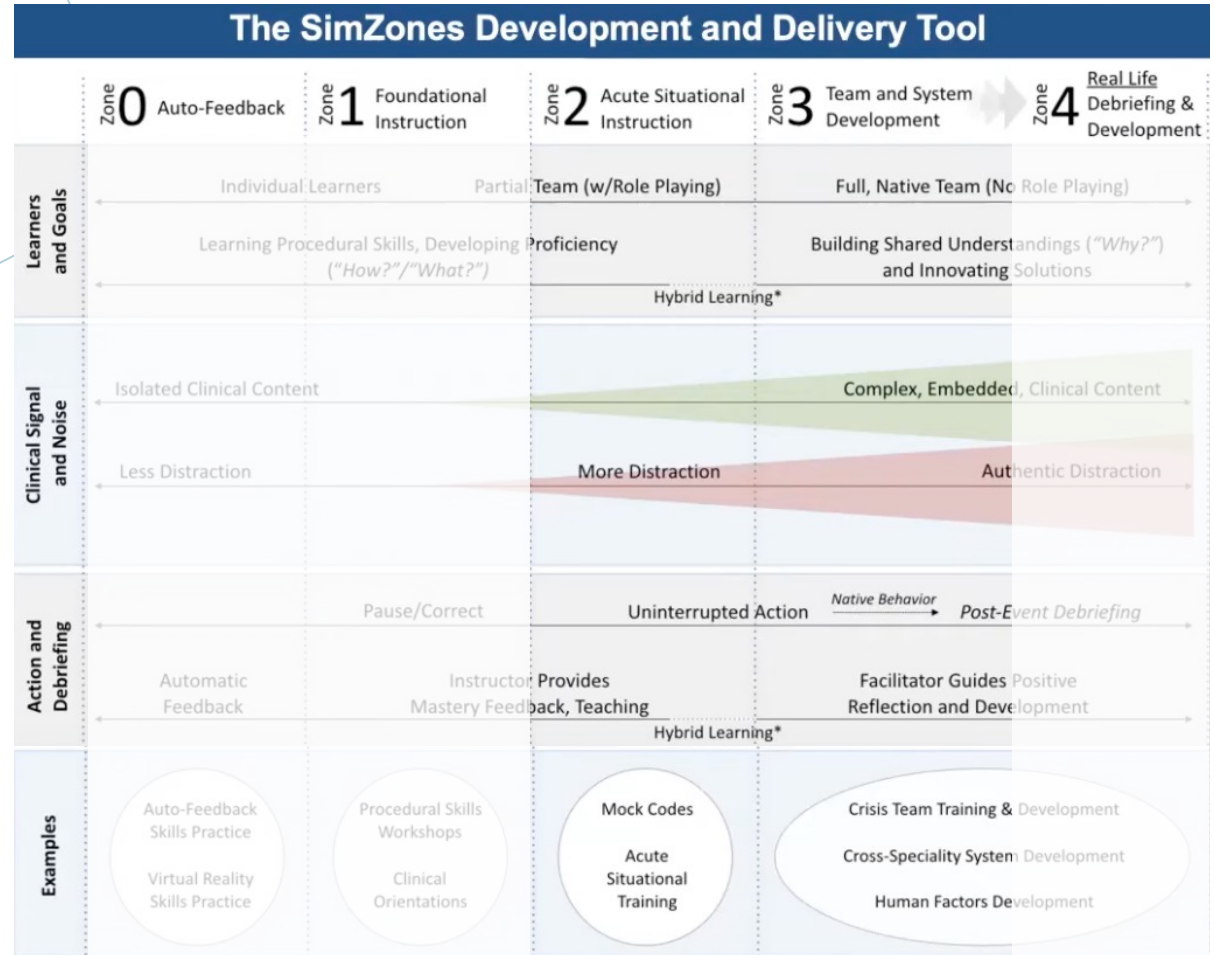
Use SimZones Framework to determine simulation education strategy for each microskill



Use SimZones Framework to determine simulation education strategy for each microskill



Use SimZones Framework to determine simulation education strategy for each microskill



Simulation Cases (Zones 2 and 3)

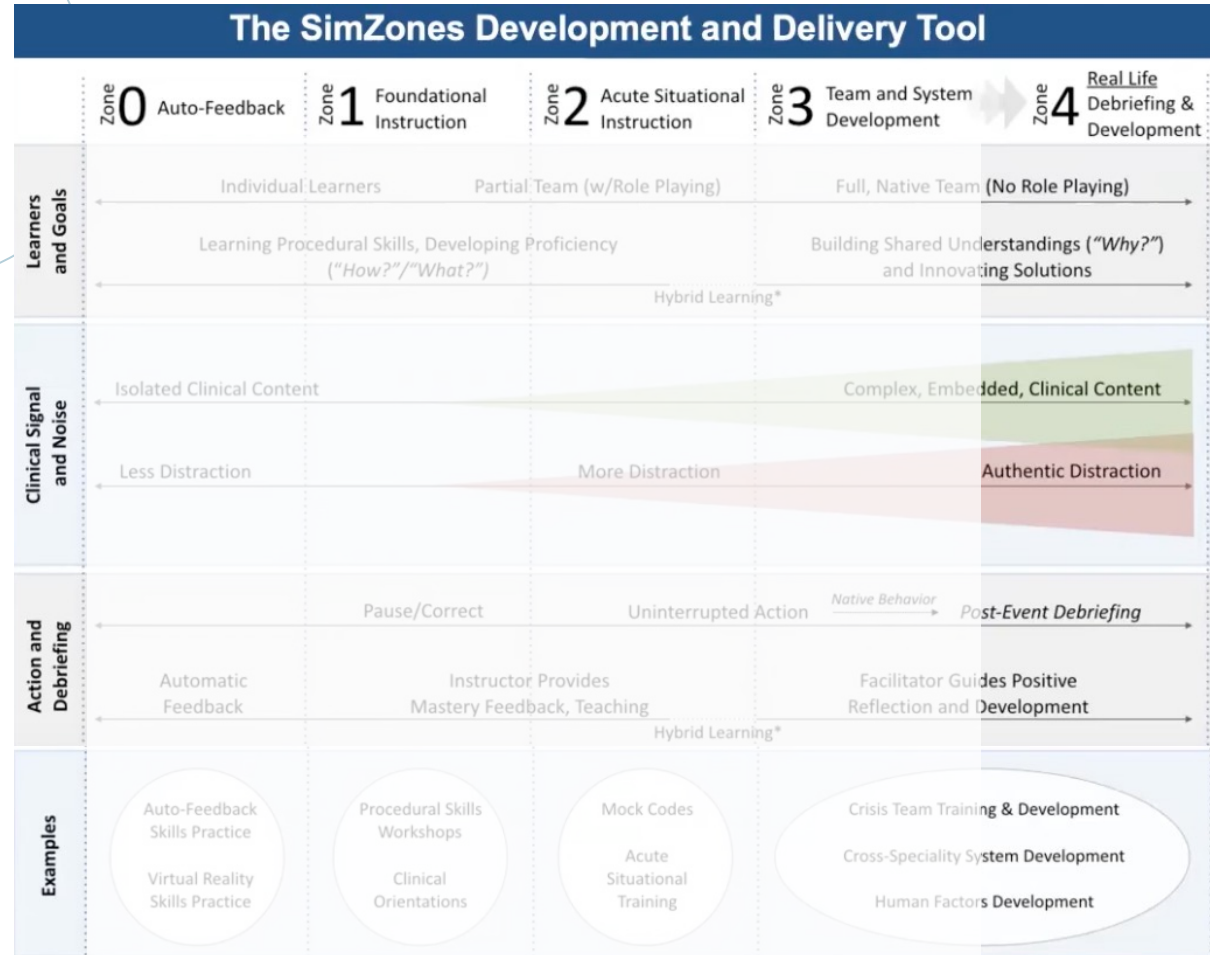


Simulation Cases (Zones 2 and 3)



The screenshot displays the MedEdPORTAL website interface. At the top right, the logo reads "MedEdPORTAL®" followed by the tagline "The Journal of Teaching and Learning Resources". A dark blue navigation bar contains the following menu items: "HOME", "SIMEDUCATION", "CASES BY CATEGORY ▾", "CASE SERIES ▾", "TEMPLATE", and "ABOUT ▾". The main content area features a dark background image of an emergency department with a gurney in the center. Overlaid on this image is the text "EM SIM CASES" in large, bold, white letters. Below this, in smaller white text, it says "Peer-reviewed simulation cases for Emergency Medicine programs available in FOAMed spirit."

Use SimZones Framework to determine simulation education strategy for each microskill



Course Design Activity

Let's review some readiness plans and think about what SimZone each microskill corresponds to



Take-home Points

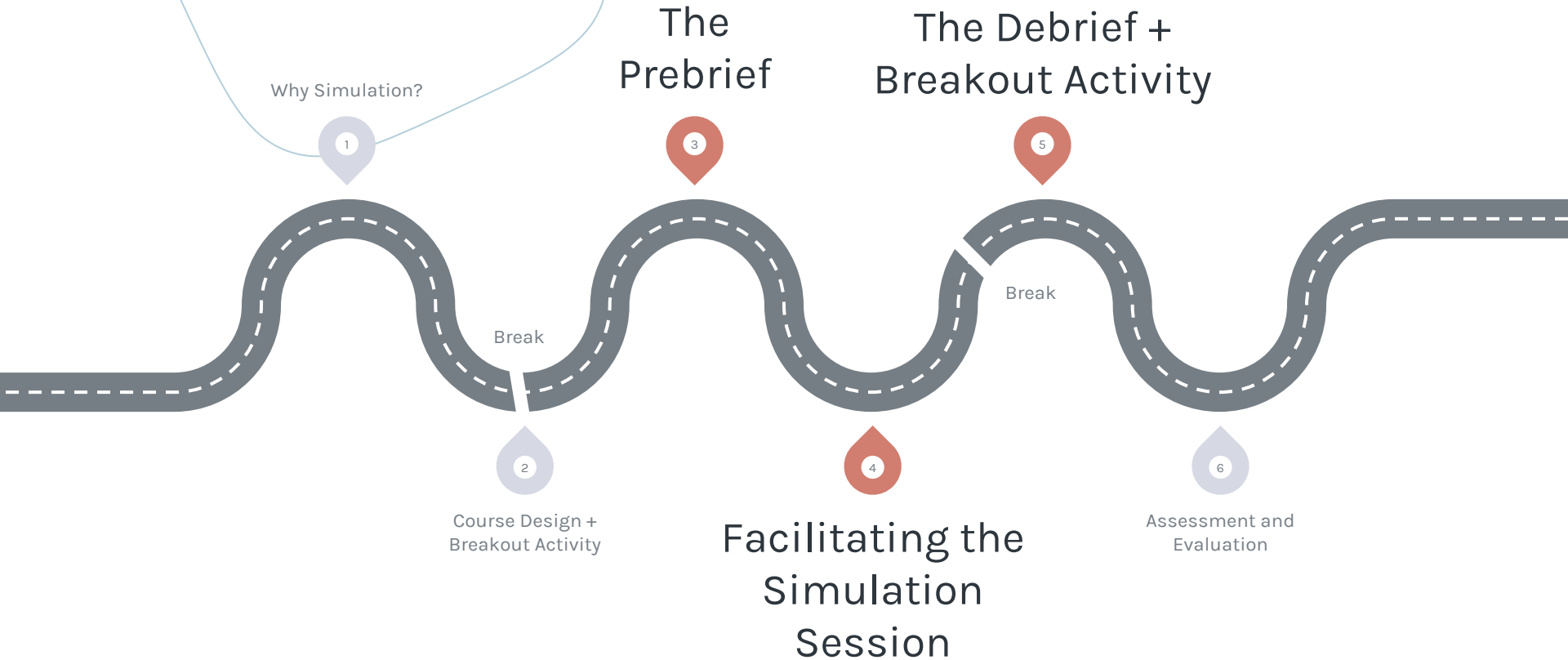


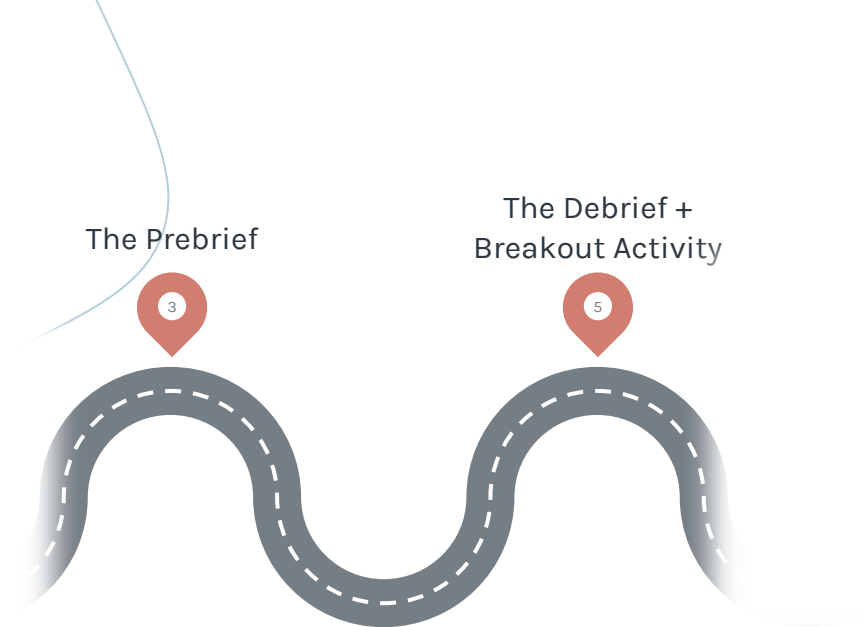
Course Design + Breakout Activity



- Simulation education utilizes higher cognitive levels on Bloom's Taxonomy
- Plan for **continuous competence** (aka readiness) by breaking down curriculum goals into microskills
- Use **SimZones framework** to help select an appropriate simulation education strategy for each microskill

Roadmap for this afternoon





The Prebrief

The Debrief +
Breakout Activity

3

5

4

Facilitating the Simulation
Session



Implementation

The Prebrief | Implementation

The Prebrief

3

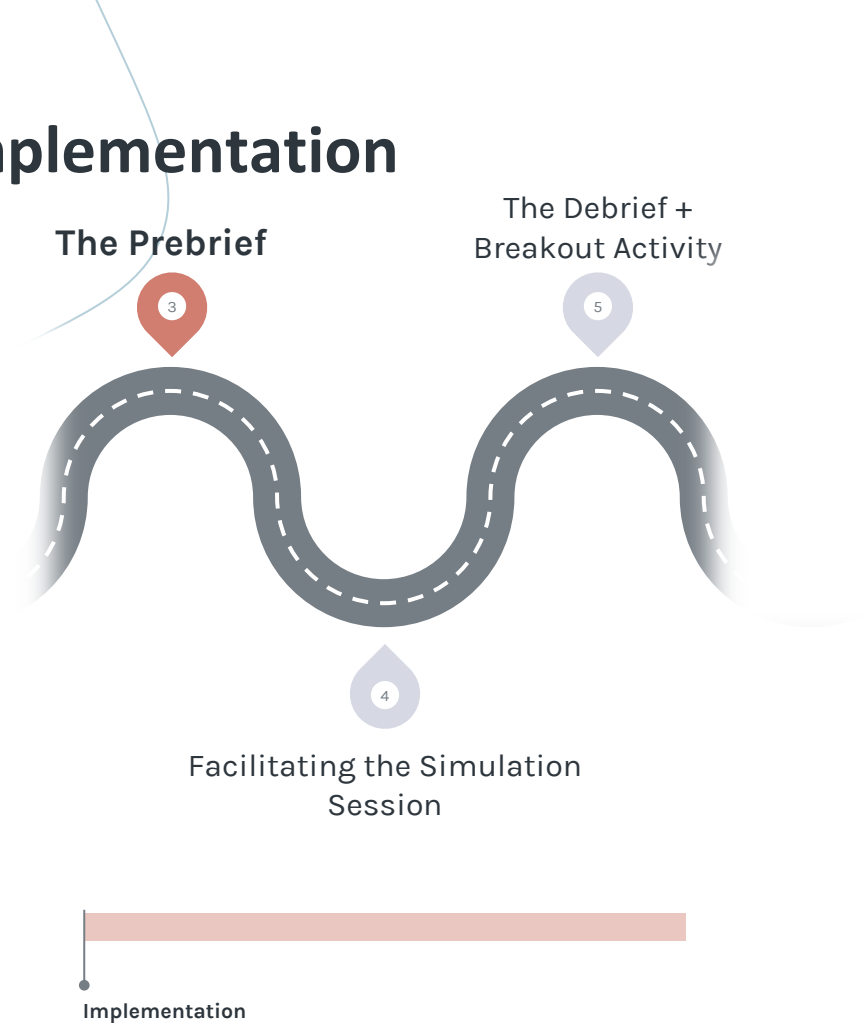
The Debrief +
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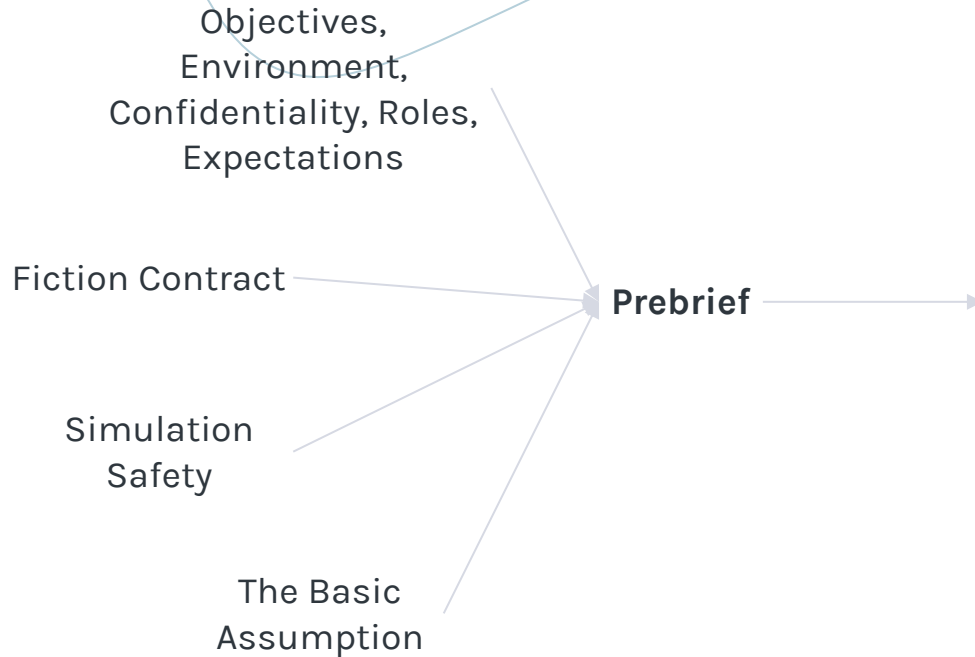
4

Facilitating the Simulation
Session

Implementation



The Prebrief helps establish a safe and engaging learning environment



Facilitating the Simulation Session | Implementation

The Prebrief

3

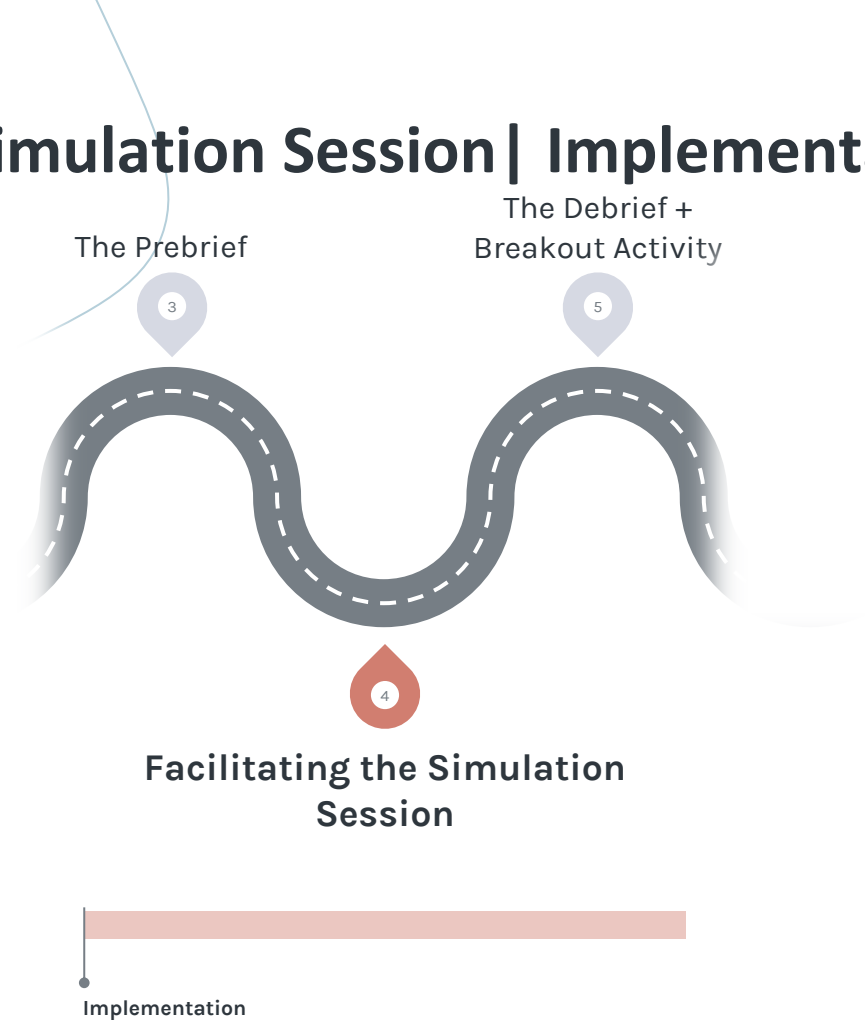
The Debrief +
Breakout Activity

5

4

Facilitating the Simulation
Session

Implementation



Pitfalls of facilitating a simulation session

**Extrinsic
cognitive load
too high**

**Poor functional
task alignment
and skill
transferability**

**Large
group of
learners**

Take-home Points

The Prebrief

3

4

Facilitating the Simulation Session

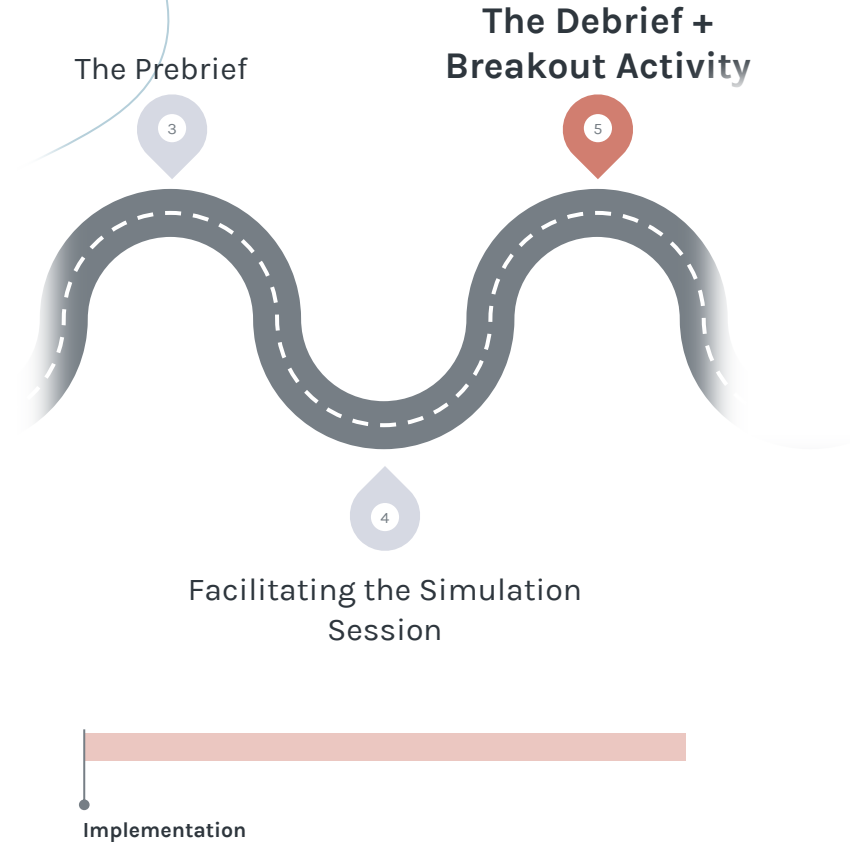


Implementation

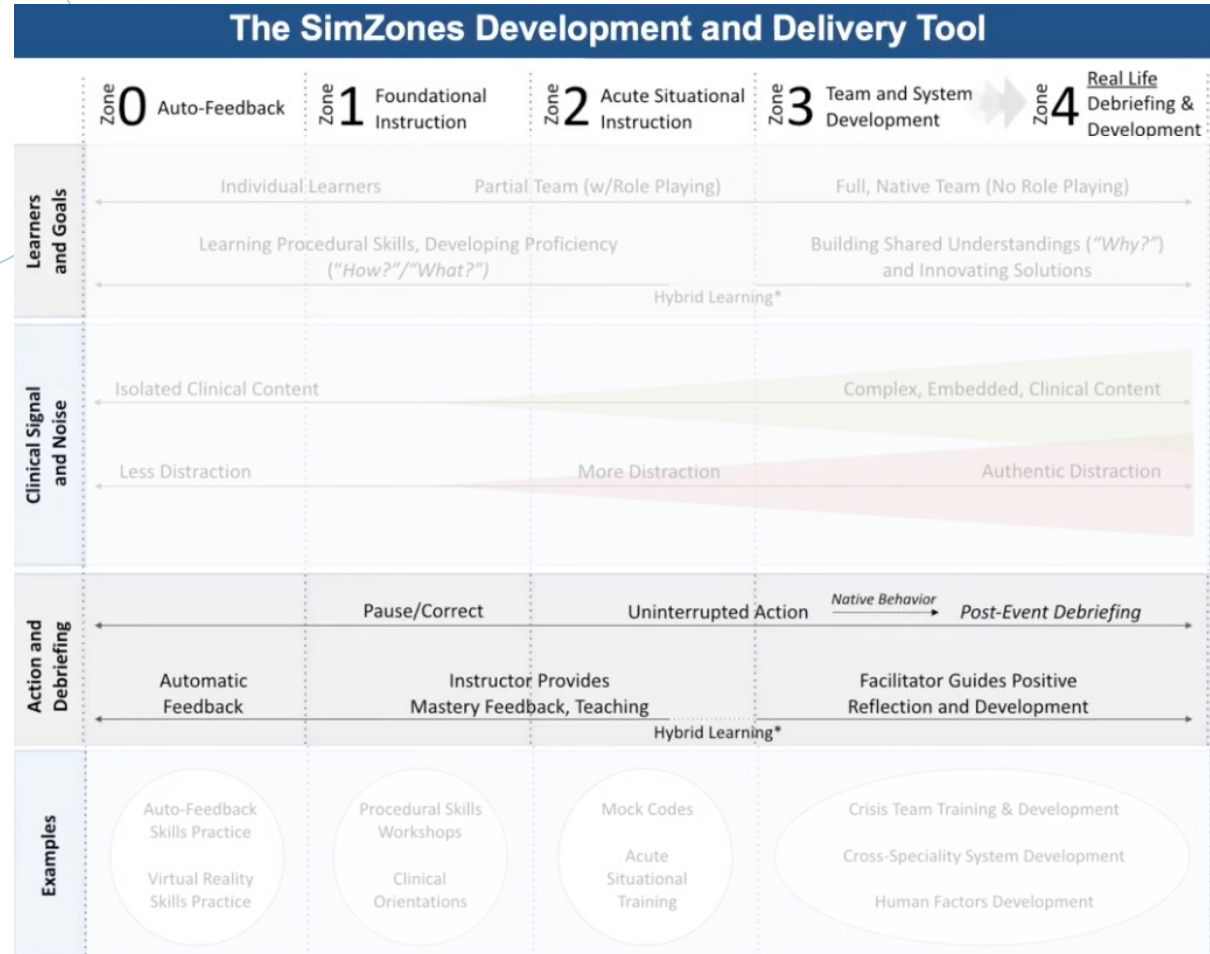
- The Prebrief helps **establish a safe and engaging learning environment**. Inadequate prebriefing is a common pitfall in simulation education.
- Other common pitfalls of simulation course implementation include: too much extrinsic cognitive load, poor functional task alignment and skill transferability, and having too many learners



The Debrief| Implementation



Use SimZones Framework to help inform debriefing style



The goal of the debrief is to uncover learner's frames

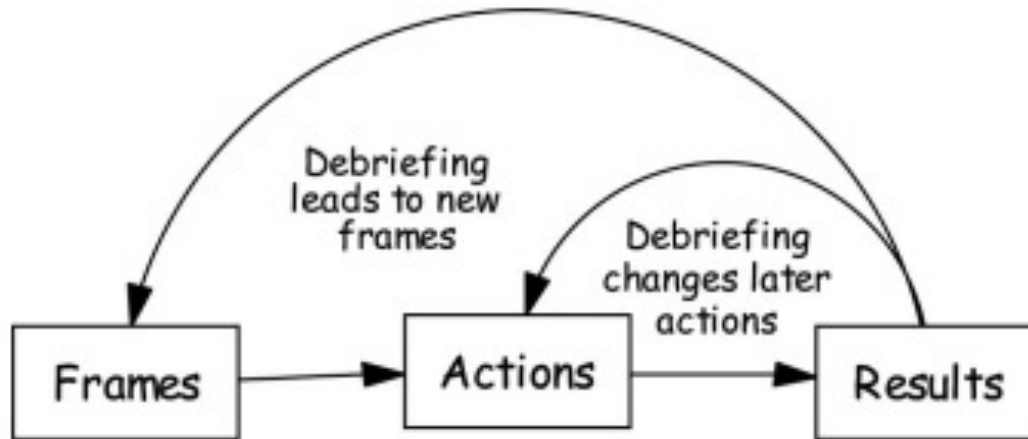
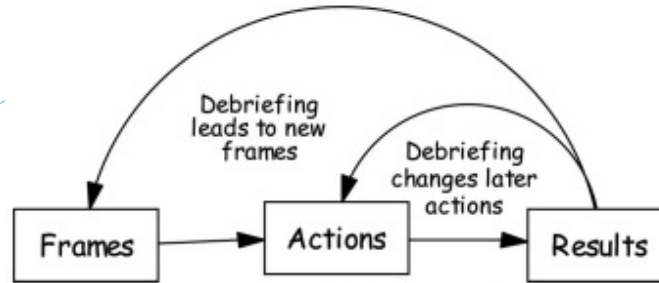


FIGURE 1. Frames are invisible, but inferable; they are in the mind of trainees and of instructors. Actions (including speech) are observable. Most results (e.g., vital signs, order/chaos) are also observable.

The goal of the debrief is to uncover learner's frames



| Example Scenario | Frames | Action | Results |
|--|---|-------------------------------------|--|
| Pt with metastatic cancer in ED for chronic pain | We have prescribed the correct pain management protocol. The patient is being non-compliant | Rolling eyes, sighing, arms crossed | Patient does not feel heard or cared for |

Don't be so (Non-)judge-y... Use Advocacy-Inquiry!



| | Judgemental | Non-Judgemental | With Good Judgement (aka Advocacy-Inquiry) |
|---------------------------|---------------------------|------------------------------------|---|
| Focus | Actions/inactions | Actions/inactions | Learner frames- knowledge/assumptions |
| Facilitator Stance | I am right, you are wrong | Right/wrong Don't hurt feelings | Understand frames |
| Conversation Technique | Shame/blame | Sandwich | Observation + concern + question |

Don't be so (Non-)judge-y... Use Advocacy-Inquiry!



With Good Judgement
(aka Advocacy-Inquiry)

| | |
|---------------------------|--|
| Focus | Learner frames- knowledge/assumptions |
| Facilitator Stance | Understand frames |
| Conversation Technique | Observation + Concern + Question |

| | |
|------------------------|---|
| Example scenario | Learner walked away to look for pulse oximeter for 90 seconds when patient's O2 saturation began to decline |
| Observation (advocacy) | "I noticed that you stepped away from the patient to look for a BVM..." |
| Concern (advocacy) | "...and it seemed to me that there could be alternate means to oxygenate the patient..." |
| Question (inquiry) | "...So I'm curious- how were you seeing the situation at the time?" |

The Basic Assumption

We believe that everyone participating in activities at _____ is intelligent, capable, cares about doing their best, and wants to improve ©

Advocacy-Inquiry is the most important step in the debrief, but it's not the only step

The PEARLS Healthcare Debriefing Tool

| | Objective | Task | Sample Phrases |
|---|--|--|--|
| 1 Setting the Scene | Create a safe context for learning | State the goal of debriefing; articulate the basic assumption* | "Let's spend X minutes debriefing. Our goal is to improve how we work together and care for our patients." "Everyone here is intelligent and wants to improve." |
| 2 Reactions | Explore feelings | Solicit initial reactions & emotions | "Any initial reactions?" "How are you feeling?" |
| 3 Description | Clarify facts | Develop shared understanding of case | "Can you please share a short summary of the case?" "What was the working diagnosis? Does everyone agree?" |
| 4 Analysis | Explore variety of performance domains | See backside of card for more details | Preview Statement <i>(Use to introduce new topic)</i> "At this point, I'd like to spend some time talking about [insert topic here] because [insert rationale here]" |
| | | | Mini Summary <i>(Use to summarize discussion of one topic)</i> "That was great discussion. Are there any additional comments related to [insert performance gap here]?" |
| Any Outstanding Issues/Concerns? | | | |
| 5 Application/Summary | Identify take-aways | Learner centered | "What are some take-aways from this discussion for our clinical practice?" |
| | | Instructor centered | "The key learning points for the case were [insert learning points here]." |

The Analysis Phase

Performance Domains

The analysis phase can be used to explore a variety of performance domains:



Three Approaches

- 1 Learner Self-Assessment**
Promote reflection by asking learners to assess their own performance
- 2 Focused Facilitation**
Probe deeper on key aspects of performance
- 3 Provide Information**
Teach to close clear knowledge gaps as they emerge and provide directive feedback as needed

Sample Phrases

- What aspects were managed well and why?
- What aspects do you want to change and why?
- Advocacy:** I saw [observation], I think [your point-of-view].
- Inquiry:** How do you see it? What were your thoughts at the time?
- I noticed [behavior]. Next time you may want to consider [suggested behavior], because [rationale].

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*Basic assumption. Copyright © Center for Medical Simulation. Used with permission.

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Pitfalls of debriefing

**Inadequate
debriefing**

**Not
enough
time for
debrief**

Debrief Activity

Divide roles amongst your table- You'll need:

1-2 'learners'

2 debriefers

1-2 observers to debrief the debrief

All will read the Case A summary in dropbox

5min: Debriefers will practice debriefing skills, trying to uncover 'learner' frames. 'Learners' will role play in the debrief, per script

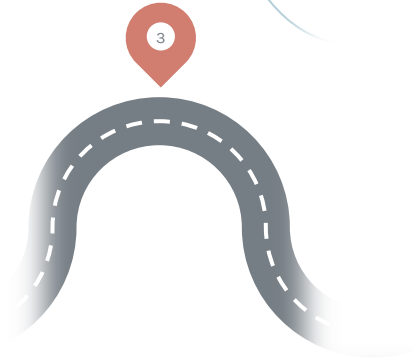
5min: Observers will then debrief the debrief

Swap roles for Case B so that everyone has a chance to practice some debriefing

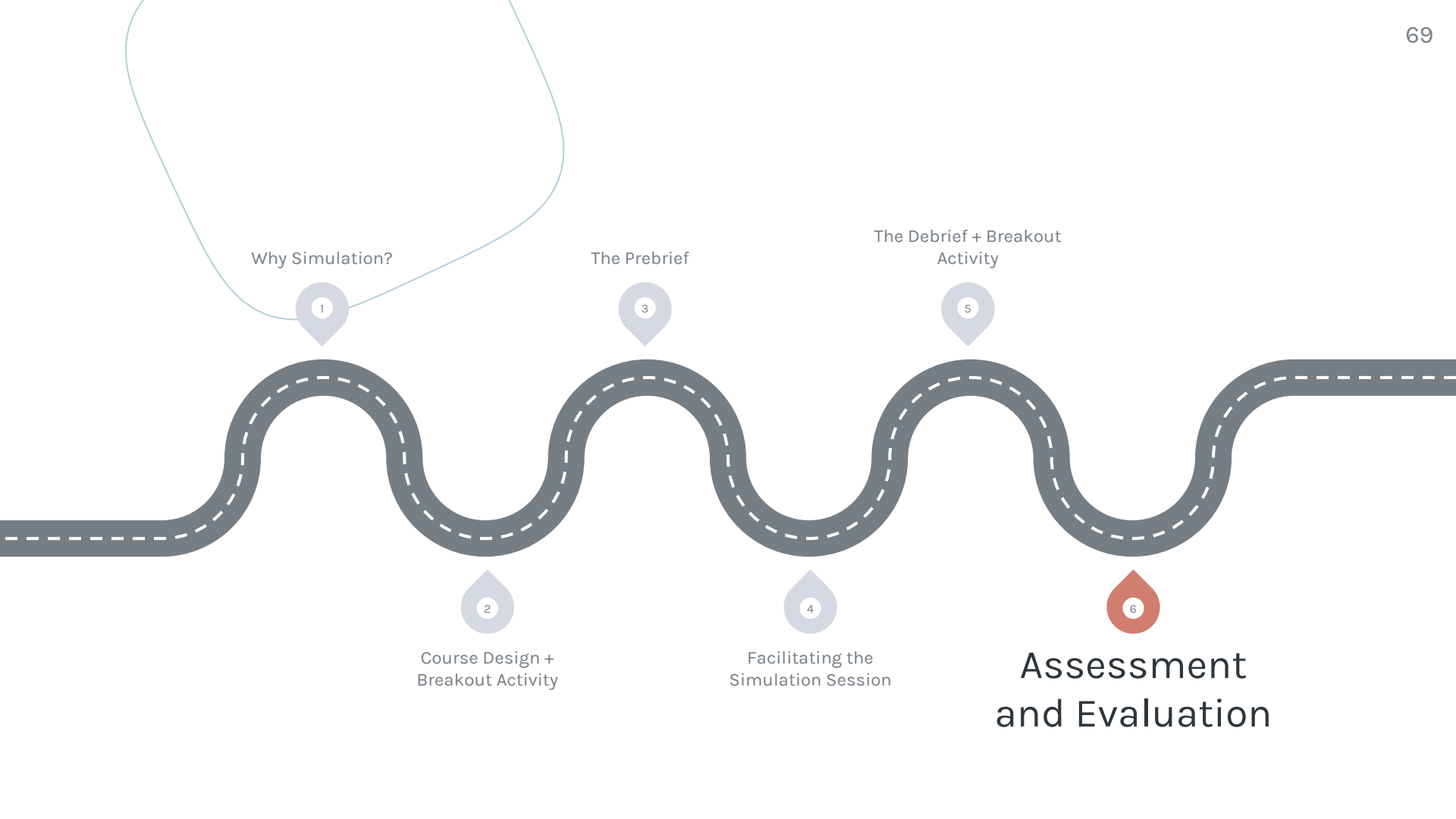


Take-home Points

The Debrief + Breakout Activity



- Use SimZones to help inform debriefing style
- For Zones 3 and 4, practice debriefing with good judgement via **Advocacy-Inquiry**
- Use a framework like **PEARLS** to help keep track of other steps in the debrief
- Common pitfalls of debriefing include **inadequate debriefing** and leaving **inadequate time for the debrief**



Why Simulation?

1

The Prebrief

3

The Debrief + Breakout Activity

5

Course Design +
Breakout Activity

2

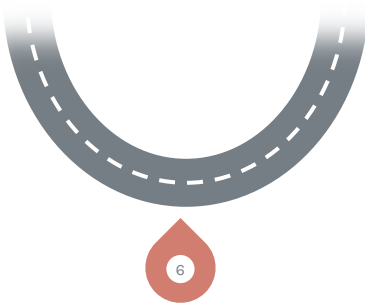
Facilitating the
Simulation Session

4

Assessment
and Evaluation

6

Assessment and Evaluation | Educational Strategies



Assessment and
Evaluation



Evaluation and
Feedback

Recall KPIs from Course Design!

What is an important issue in your department?
 What is the gap?
 What risks are created by this gap?

Key Performance Indicators

Stakeholders

Reactions:

Vision:

Learning:

Gap:

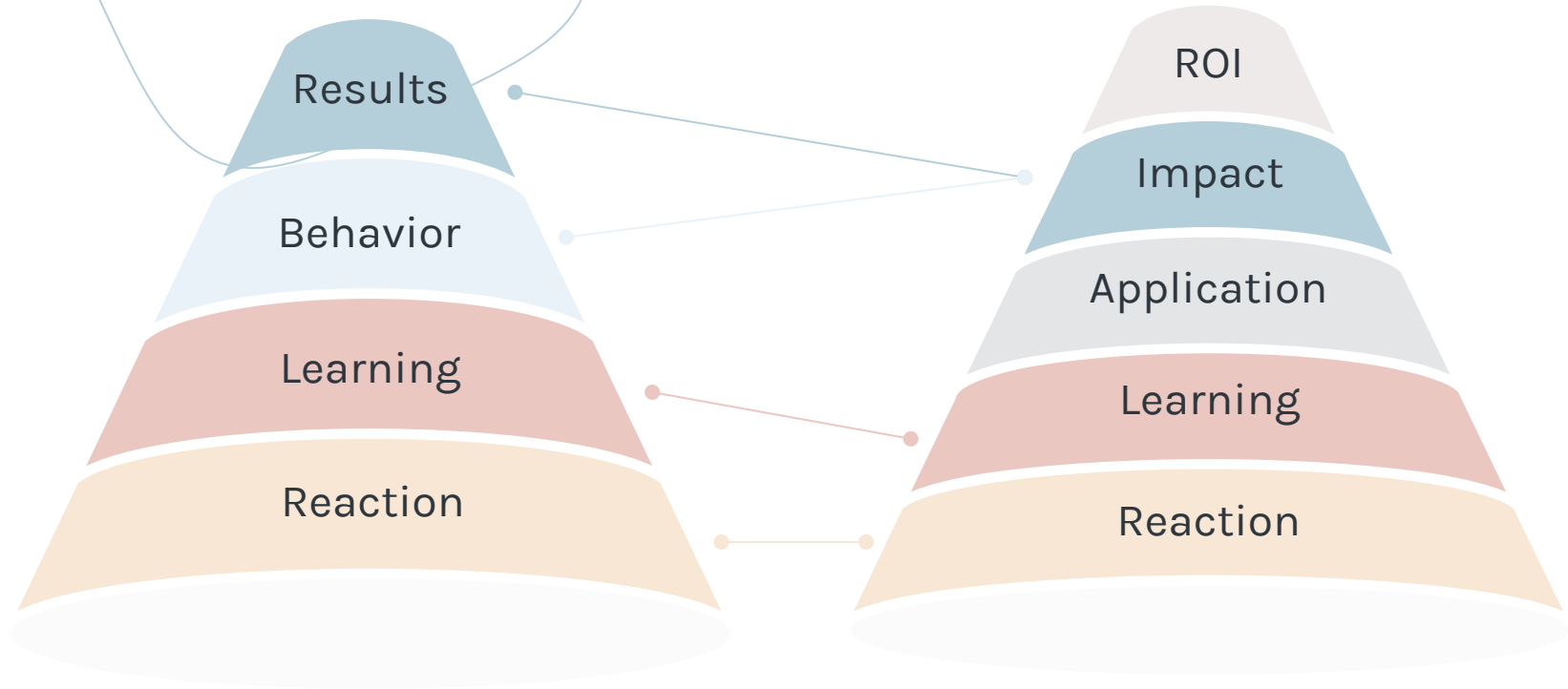
Application:

Risks:

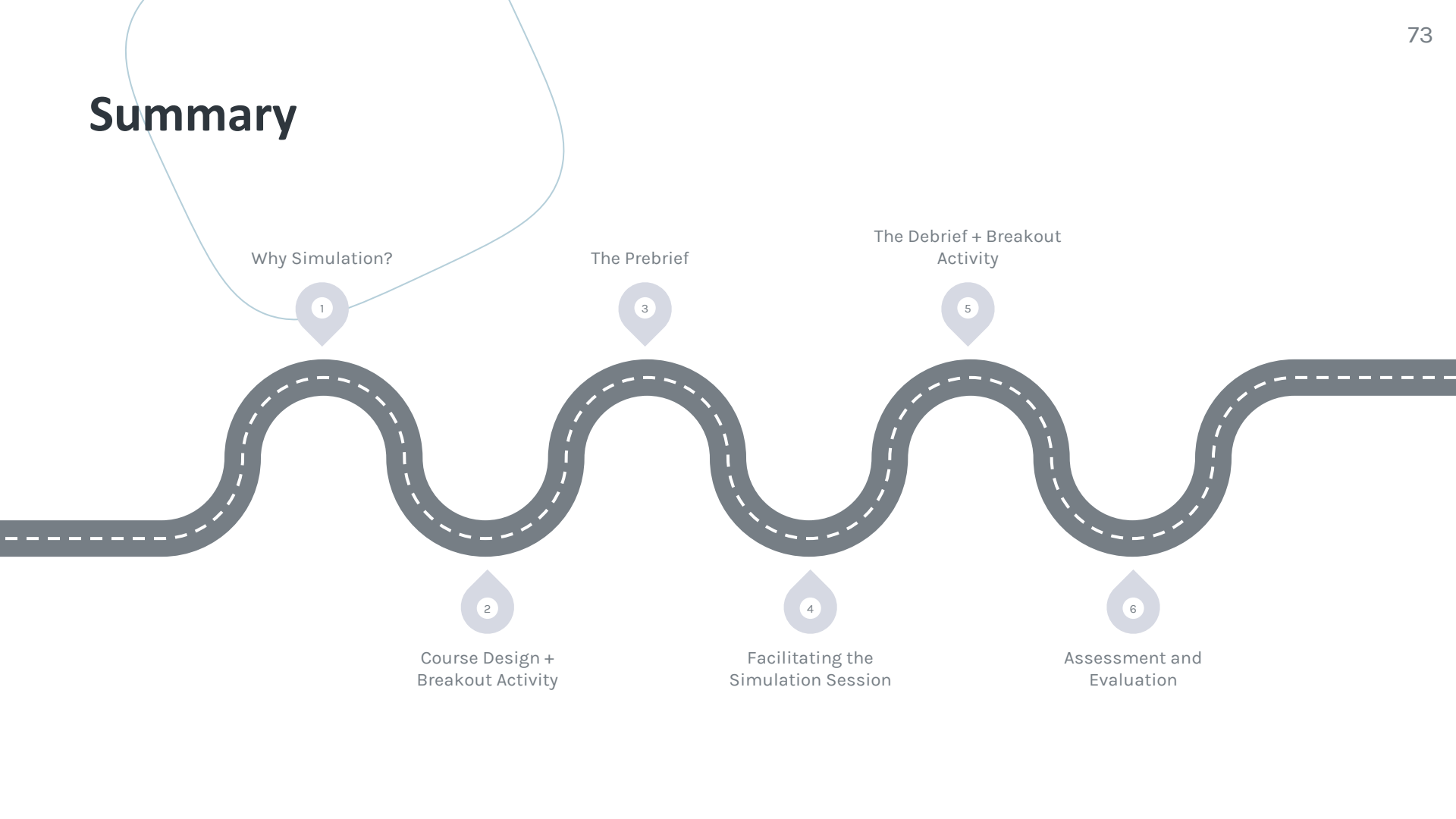
Impact/Results:

ROI:

Use Kirkpatrick's Model to frame your KPIs



Summary



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Take-home Points

Why Simulation?



1

- Simulation education promotes **patient safety**, benefits the whole **institution**, and is an educational strategy that effectively **promotes learning via Kolb's Theory of Experiential Learning**
- Simulation is very resource-intensive, so its use should be intentional

Take-home Points



Course Design



Problem
Identification of
General Needs
Assessment

Needs Assessment
of Targeted
Learners

- The first four of Kern's six steps apply to designing a simulation course.
- Ensure that your investment in developing this simulation curriculum is worthwhile by **thinking about KPIs and stakeholders early** in the process
- Use Kirkpatrick's Model to frame KPIs

Take-home Points



Course Design + Breakout Activity



Goals and
Objectives

Educational
Strategies

- Simulation education utilizes higher cognitive levels on Bloom's Taxonomy
- Plan for **continuous competence** (aka readiness) by breaking down curriculum goals into microskills
- Use **SimZones framework** to help select an appropriate simulation education strategy for each microskill

Take-home Points

The Prebrief

3

4

Facilitating the Simulation Session

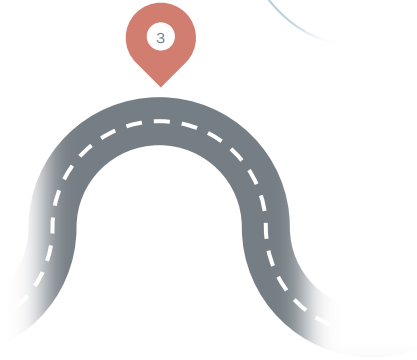


Implementation

- The Prebrief helps establish a **safe and engaging learning environment**. Inadequate prebriefing is a common pitfall in simulation education.
- Other common pitfalls of simulation course implementation include: too much extrinsic cognitive load, poor functional task alignment and skill transferability, and having too many learners

Take-home Points

The Debrief + Breakout Activity



- Use SimZones to help inform debriefing style
- For Zones 3 and 4, practice debriefing with good judgement via **Advocacy-Inquiry**
- Use a framework like **PEARLS** to help keep track of other steps in the debrief
- Common pitfalls of debriefing include **inadequate debriefing** and leaving **inadequate time for the debrief**

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Thanks!

Please email me with any questions or feedback!
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