

Enriching Resident Engagement During Whiteboard Mini-Talks

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Introduction

Attending physicians and residents across specialties use whiteboard mini-talks to facilitate small-group teaching within clinical teams. Whiteboard mini-talks are a “chalk talk” subtype that combines hand-drawn text and visual elements on the whiteboard to simplify concepts and encode deeper learning.¹

Whiteboard mini-talks have long been a preferred teaching modality for residents, likely related to the active learning principles that *can* be integrated.² Unfortunately, busy clinical teachers often approach them as condensed didactics, resorting to passive learning practices such as asking recall-based questions and omitting a learner needs assessment. Additionally, they may overlook the importance of arranging the physical environment to optimize learning. In this scenario, the whiteboard mini-talk becomes teacher-directed, risking resident disengagement and preventing them from applying higher-order cognitive skills that promote enduring memory.^{3,4} Additionally, overreliance on recall-based questions rather than clinical reasoning may promote “toxic quizzing,” which engenders a stressful learning environment.⁵ Instructors likely default to these practices because of insufficient peer feedback and faculty development on how to select and synthesize appropriate educational resources to develop an effective whiteboard mini-talk.

In this article, we detail 8 strategies for enriching resident engagement throughout whiteboard mini-talks (provided as online supplementary data), aimed at accomplishing 4 essential goals: cultivate the learning environment, amplify active learning, captivate learners’ attention, and facilitate reflection. These tips reflect updated, evidence-based teaching principles overlaid on multi-institutional experience in whiteboard-based education and graduate medical education leadership.

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Editor’s Note: The online version of this article contains strategies to enrich resident engagement during whiteboard mini-talks and a visual example of a horseshoe layout for a classroom.

Cultivate the Learning Environment

Strategy 1: Prepare the Mise-En-Scène

The *mise-en-scène* is a theatrical term that translates from French to “placing on stage,” or the deliberate arrangement of actors and props.⁶ Applied to whiteboard mini-talks, the *mise-en-scène* constitutes the physical learning environment—the orientation of the whiteboard, table, and chairs. For example, the horseshoe layout fosters learner participation, which can improve whiteboard mini-talks.⁷ The ideal horseshoe configuration for a whiteboard mini-talk places the whiteboard at the head of the room, a small table in front of the whiteboard, and chairs around the table (provided as online supplementary data). The table provides the instructor with a space for their “props” (markers, eraser, and teaching script) and residents with a surface for notetaking. Clinical teachers should arrive early to the teaching space and create the horseshoe configuration to optimize resident participation.

Strategy 2: ORIENT the Talk

When introducing your whiteboard mini-talk, ORIENT the talk to nurture the social and psychological learning environment. ORIENT stands for Objectives, Relevance, Importance, Enthusiasm, Needs assessment, and Time frame. ORIENT establishes an educational contract between you and your learners by addressing their needs, expectations, and roles and defining the session’s content.⁸ We enumerate no more than 2 to 3 learning objectives to focus residents on crucial concepts, then highlight the topic’s relevance and importance to their clinical practice. Show your enthusiasm for the topic to pique their interest and bolster the psychological safety of the learning environment.⁹ Perform a rapid needs assessment, asking residents about their prior knowledge of the topic and then tailoring content to build new knowledge upon existing mental frameworks.¹⁰ Lastly, delineate the whiteboard mini-talk’s duration—ideally 15 to 20 minutes to optimize attention¹¹—as residents have competing clinical responsibilities.

Amplify Active Learning

Strategy 3: Integrate Gamification

Gamification introduces game design elements into non-gaming contexts to improve academic performance and enhance learner engagement and knowledge acquisition.^{12,13} Sticky note labels are a time-efficient and inexpensive strategy for integrating gamification into a whiteboard mini-talk. You can challenge residents to arrange sticky note labels to complete a diagnosis/treatment algorithm or a pathophysiological pathway outlined on the whiteboard. Prepare sticky notes in advance and consider using various colors to differentiate mechanisms. For example, in our whiteboard mini-talk on approach to acute coronary syndromes, we gamify with sticky note labels that represent essential medications (FIGURE 1).

Strategy 4: Erase, Space, and Replace

Compared with the marker, the eraser is an often neglected yet equally powerful tool to promote active learning during whiteboard mini-talks. We developed a strategy called Erase, Space, and Replace (ESR) in which we review a concept on the whiteboard, erase content to leave a scaffold, provide temporal “space” by switching to a new idea, and return to the original content, tasking residents to replace what’s missing. ESR leverages 3 principles of cognitive learning theory: retrieval practice, spaced learning, and generation.¹⁴

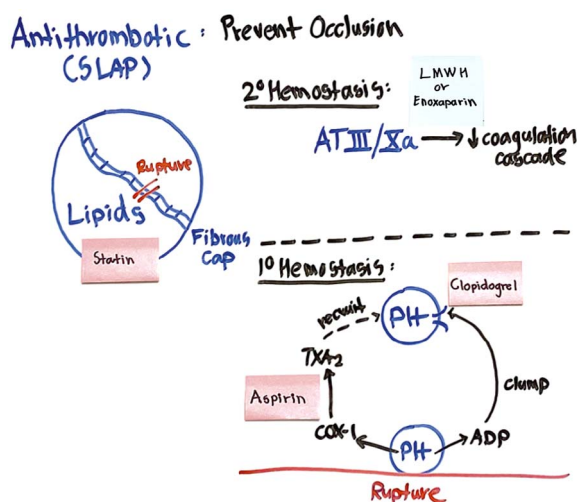


FIGURE 1
Gamify With Sticky Note Labels

Note: In our whiteboard mini-talk on approach to acute coronary syndromes, we challenge learners to place sticky note labels for statins, low molecular weight heparin/enoxaparin, clopidogrel, and aspirin next to their therapeutic targets in the primary and secondary hemostasis pathways. We use sticky notes to symbolize medications that inhibit or activate their targets, respectively.

Retrieval practice asks learners to recall concepts from memory and helps prevent forgetting.¹⁵ Spaced learning allows a period to elapse between practice sessions and improves long-term retention, and generation tasks learners to generate their answers from minimal cues.^{16,17} We provide an example of ESR in which we ask residents to compare the changes in lung volumes on pulmonary function testing to differentiate restrictive lung diseases (FIGURE 2).

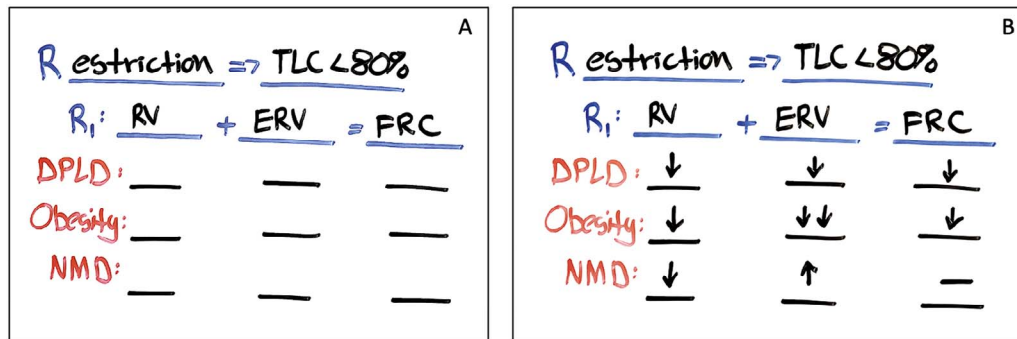
Strategy 5: Adopt Multilevel Questioning

As the delivery of most whiteboard mini-talks occurs within clinical teams, you must negotiate the needs of learners across the spectrum of Dreyfus’ developmental stages, from the novice medical student to the proficient senior resident.¹⁸ You can accomplish this with multilevel questioning techniques such as broadening, targeting, and probing.¹⁹ Broadening asks “what if” questions, such as, “How would your antibiotic selection for bacterial meningitis change if this were an immunocompromised patient?” Targeting aligns a question with the learner’s developmental stage. For example, you might ask the following question to a senior resident (proficient stage): “Erin, can you compare and contrast pericarditis with restrictive cardiomyopathy?” Probing centers on the learner to help expand their clinical reasoning. For example, you might ask the following question to an intern (advanced beginner stage): “Yen, I heard you say, ‘consider a D-dimer’ for this patient with a suspected pulmonary embolism. What historical elements helped you make this decision?” Applied throughout a whiteboard mini-talk, multilevel questioning boosts learner participation, interactivity, and confidence in their abilities.²⁰

Captivate Attention

Strategy 6: Employ Effective Body Language

Implementation of effective body language throughout a whiteboard mini-talk allows you to deliver nonverbal cues that can help sustain resident attention, optimize multilevel questioning, and emphasize important teaching points.²¹ Avoid talking directly into the whiteboard, keeping your back turned toward the audience, and standing directly in front of the whiteboard, as these practices can dampen attention.²² Instead, write or draw a teaching point, pause, then turn to your learners and deliver the content. To enhance questioning, you should assume an open stance (palms out and arms and legs uncrossed) and allow residents at least 5 to 7 seconds to reflect on a question before providing an answer.²³ Exaggerated hand gestures, pointing at key content, and tapping

**FIGURE 2****Erase, Space, and Replace (ESR)**

Note: ESR incorporates retrieval practice, spaced learning, and generation into a whiteboard mini-talk. In our whiteboard mini-talk on the approach to pulmonary function testing, we use ESR to help learners remember the changes in lung volumes that differentiate restrictive lung diseases. Panel A shows the “erased” scaffold, and Panel B shows the “replaced” content.

on the whiteboard provide additional visual and auditory stimuli to emphasize key concepts and grab attention.²¹

Strategy 7: Incorporate a 3-Minute Pause

Pause procedures involve brief pauses, intercalated throughout a teaching session, during which learners work collaboratively to process and elaborate on the presented material.²⁴ Pause procedures help sustain attention and improve long-term memory performance.²⁵ The 3-minute pause is a common organizing framework that assigns learners 3 tasks within 3 minutes: summarize key points, add your thoughts, and pose clarifying questions.²⁶ At the halfway point, include a 3-minute pause, ideally between 2 “blocks” of content.²⁷ For example, during a whiteboard mini-talk on approach to acid-base disorders, we take a 3-minute pause at “halftime” between segments on respiratory and metabolic acid-base disturbances. We invite one resident to summarize key concepts, another resident to elaborate on their clinical experiences, and then open up to the small group for clarifying questions.

Facilitate Reflection**Strategy 8: Identify the Muddiest Point**

Facilitate reflection at the end by asking residents to identify the “muddiest point” from the session. The muddiest point is a practical reflection technique that helps learners identify the most challenging concept from a teaching session through retrieval practice.^{15,28} Once residents have reflected and provided their answers, you should take 1 to 2 minutes to clarify the content. This reflection period is also an excellent opportunity to role model self-directed learning

by highlighting an additional resource the team can consult for further reading.¹⁰

Implementing the 8 Strategies

The 8 strategies for enriching resident engagement during whiteboard mini-talks are grounded in cognitive psychological and educational theory and help shift the focus from attending- to resident-centered to promote deeper cognitive processing. That said, *time* (for preparation and for the talk itself) is a major barrier to implementation, especially since clinical teachers often deliver whiteboard mini-talks on-the-fly and to residents with competing responsibilities, such as afternoon clinic and scheduled educational conferences. Insufficient peer feedback on whiteboard mini-talk delivery is an additional barrier and may potentiate the use of passive learning techniques.

Clinical teachers should view these strategies as individual *elements*—effective both on their own and in combination. In our experience, implementation of even 1 to 2 strategies is time-efficient and significantly enriches resident engagement during whiteboard mini-talks. Specifically, for on-the-fly sessions, ORIENT the talk, adopt multilevel questioning, employ effective body language, and identify the muddiest point. For longer whiteboard mini-talks and/or when advanced preparation is feasible, prepare the mise-en-scène, integrate gamification with sticky note labels, take a 3-minute pause, and apply ESR. Ask a colleague to perform a peer observation of your whiteboard mini-talk to provide formative feedback on your application of these strategies.

Whiteboard mini-talks remain an important educational tool across disciplines, but their effectiveness and impact hinges upon resident engagement. Clinical teachers can select from these strategies to enrich

resident engagement by cultivating the learning environment, augmenting active learning, captivating attention, and facilitating reflection.

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