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Title: Creating effective and engaging presentations

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Editor's note: However experienced we may be at giving presentations, there are always ways we may improve. Clinical educators new to presenting learn from role models and observing what makes a good presentation engaging, and what turns off an audience when the speaker lacks charisma. This Toolbox reminds us of the necessary skills for effective presentations using educational theory and practical examples to emphasise good practice. The content focuses on the message, the visuals and the delivery. The

authors stress it is important to know your audience. Slides, if used, and oral delivery need to complement each other and not distract from core content. We have all groaned at over packed Powerpoint presentations and text-heavy slides that the lecturer simply reads out. As with other skills, practice leads to improvement, and this can be further enhanced by having a critical friend watch, listen and give constructive and honest feedback. The Toolbox gives examples of good visuals and active learning techniques that should help elevate didactic delivery to a stimulating and educational experience.

Introduction

Effective presentation skills are vital tools in the clinician educator's toolbox. Today's learners expect more than traditional presentations that often involve speakers reading from cluttered and wordy slides. This article integrates educational theory with practical advice to provide suggestions to improve the three fundamental components of every presentation: *the message, the visuals, and the delivery.*

The Message

Work to develop a clear, concise core message for the presentation, taking into account both the content and the learners' needs and interests. Once the core message is created, the talk should be structured to elaborate and develop the main points and use techniques that will make the message memorable.

Determine the Core Message

Deciding on a core message can be challenging. Teachers have a natural tendency to want to present everything they know, but less is more when it comes to effective presentations. Choose just 3-5 key points for the audience to remember (i.e. Early cardiac catheterization for ST elevation myocardial infarction (STEMI) is critical; Initial

treatment includes oxygen, nitroglycerin, and heparin; If catheterization is not available in < 90 minutes, administer thrombolytics.). Focus on these points and avoid excessive detail. Presenting too much information will cause *cognitive overload* and will impede learning. Cognitive Load Theory (CLT) describes different types of load. Intrinsic load is information essential for the task of knowledge construction while extraneous load is non-essential and distracts from the task.[1] When creating an academic presentation, strategies that titrate intrinsic load to the level of the learners and decrease extraneous load should be deliberately used. Practically, this may be accomplished by sequencing the content from simple to complex and presenting just the essentials.

Know the Learners

Knowing the learners involves both understanding what they already know, as well as their motivation for learning. This allows the presenter to connect new information with data previously stored in memory,[2] a technique known to improve retention. Before crafting the presentation, take time to understand where the learners are in their course or curriculum. Knowing in some detail what has been previously covered on the topic allows better definition of new learning outcomes. Take time at the outset of the presentation to *activate* the audience's *prior knowledge*, ensuring its accuracy, appropriateness and sufficiency, and then linking this with new information. Practically, this may be done using a brief (formal or informal) poll, or audience query using targeted questioning (i.e. "What do you know about risk factors for acute coronary syndrome?"), with brief clarification and correction of facts and concepts before proceeding. Since motivation and learning are integrally linked, motivation often determines what information is retained, and ultimately acted upon to change behaviour.[3] Tell the learners *why* they should pay attention at the outset of the presentation. Make the information *important* and *relevant* to them by using an emotional "hook" (i.e. "Failure to recognize a STEMI promptly can lead to significant morbidity and mortality.") These steps prepare the audience to listen attentively to the message.

Emphasize Key Points to Enhance Retention

Start by clearly articulating the desired learning outcomes, and connect them to those of the overarching curriculum. Take a moment to contextualize the outcomes (i.e. why is this important to good patient care?). Next, guide the audience through 3-5 key points that reinforce these outcomes, emphasizing each and linking back to the stated goals. Make each major idea "sticky" by presenting in a manner that engenders audience emotion, engagement, interest and curiosity. The six principles of sticky ideas are outlined in Figure 1, and they may be remembered by the mnemonic SUCCESS—Simple, Unexpected, Concrete, Credentialed, Emotional, StorieS.[4] For more complex processes or abstract topics, consider using a concept map to visually portray relationships and ideas. Concept maps can serve as an organizational guide, and can enhance learner retrieval and retention of information.[1] Close the presentation with a recap of the main points. Use techniques to improve retention: Connect back to the learners' motivation with either a *call to action* (i.e. ensure door to balloon time is less than 90 minutes!) or use a *commitment to change* exercise (i.e. have the audience write down, or express out loud the key things they will take away from the presentation that will influence their future practice).[5]

The Visuals

Visuals should be simple and clean, allowing the audience to focus on the message. Mayer's work on multimedia learning has resulted in several evidence-based principles to guide slide design, and facilitate learning.[6] The principles focus on reducing *extraneous load*, the superfluous information not related to instructional goals that overloads sensory processing and makes learning inefficient.

Avoid Distractions

Didactic presentations using slide software are ubiquitous in medical education. PowerPoint™, Prezi™, and Keynote™ can all be powerful tools when used judiciously, but they have many features that can lead to distraction. Mayer's coherence principle

states that people learn better if extraneous material is excluded.[6] In practice, this requires discipline to ensure the visuals support the key message: Begin with a clear black or white background, easy to read contrasting text, and sans serif fonts. Avoid busy backgrounds, or complicated graphics that can overpower key points and weaken the organizational structure of a presentation. Eliminate unnecessary images, text, sounds, and other superfluous information. Steer clear of flashy transitions, excessive animations and sound effects unless needed to convey a specific point. When learners expend less energy trying to identify key information amidst distractions, working memory is freed up to focus on processing the main points of the presentation.

Limit Written Text

Limit written text on slides and rely on the spoken word to convey the message. Mayer's modality principle states that people learn more deeply from a multimedia presentation when words are spoken aloud rather than written on slides.[6] The dual channel hypothesis identifies two separate pathways for material to enter working memory.[7] A learner can process visual stimuli through one channel, and can simultaneously process language stimuli in *either* written *or* spoken form through the second channel. Learners have great difficulty, however, processing *both* written and spoken word at the same time, because they occupy the same channel. This explains why reading from slides is ineffective for learning. Some faculty place text onto slides so that students may later use the slides as a study guide. While expedient, this is not an effective presentation strategy. If students need a summary, create a handout or electronically deliver additional material to complement the presentation.

Enhance the Visual Impact

The visual impact of the presentation is enhanced when images are used to complement the spoken word. Mayer's multimedia principle suggests people learn better from words *and* pictures than from just words alone.[6] Educators may wish to explore examples of pecha kucha (a fast-paced presentation in which 20 slides are presented for 20 seconds

each) to see the power of this principle. Since words and images arrive in working memory via separate sensory pathways, they are processed via cooperative, additive channels enhancing impact. Studies in various settings have shown that presentations that effectively combine words and images result in improved learning outcomes. Among medical students, statistically significant improvement in short-term retention of information was found when using a presentation based on these multimedia principles compared with a traditional lecture.[8] Visually appealing high quality stock photos or professional graphics are preferred. Avoid the use of gratuitous personal images. Format the slide background so the image fills the slide whenever possible, and avoid using multiple images per slide. For an example of a presentation that conforms to Mayer's multimedia principles, compared to one that does not, refer to Figure 2.

The Delivery

Presentation delivery is enhanced by a dynamic presence. Aim to be rehearsed, polished, and well-timed. Use active learning strategies to keep the audience engaged and make learning more effective.

Develop a Presence

Connect, persuade, and above all, inspire the audience with an engaging presence. Avoid poor posture and other non-verbal behaviours that can convey a lack of confidence or credibility. Square shoulders, plant feet shoulder width apart, and maintain an open stance. Use the podium judiciously. Focusing on the microphone can appear rigid. Lean into the lectern with arms spread wide to make a key point. Come out and stand on the far side to explicate a concept. Using a lapel microphone (or similar) allows more movement around the stage. Be enthusiastic about the topic. The "Dr. Fox effect" found that expressive behaviours lead to higher levels of student achievement and satisfaction.[9] Expression is accomplished through the use of vocal variation, facial expression, and gestures. Speak from the diaphragm to power the voice and vary the

tone, inflection, and cadence of speech to maintain interest, demonstrate confidence and credibility. Use body language to emphasize key points. Movement can be used to guide the audience through the topic: move towards the audience when asking a question or stating a revelation and move across the stage when making a connection. Establish eye contact, pausing only momentarily to glance at notes when needed. Eye contact helps establish a bond between the presenter and the audience and is best when it focuses on a few individuals briefly, instead of scanning the room.

Practice Makes Perfect

Rehearse and be well-prepared. Repetition helps with timing, cadence, and fluency. Try memorizing the first 3-5 minutes of the talk. Delivering a strong opening not only captures the attention of the audience, but also helps overcome any initial performance anxiety, which boosts confidence for the rest of the presentation. When rehearsing, divide the presentation into segments and practice each segment separately to avoid the serial position effect (i.e. the opening is delivered fluidly, but the remainder is delivered with less ease). Pay attention to pacing, transitions, and breaks in the flow of presented material. Pausing allows learners to better clarify and assimilate information, and to reset their attention. Three critical points to pause in a presentation include: before and after an important point, before and after a transition from one key talking point to the next, and between the opening, the main body and the closing.[10] Audience attention predictably wanes after 15-20 minutes. Deliberate pauses during longer presentations can provide excellent opportunities to ask learners questions related to the information just presented or to incorporate other active learning strategies to help consolidate knowledge. For a typical 1-hour presentation, plan 3-4 pauses.

Make it Interactive

Listening to a lecture should not be a passive activity for the learner. Instructional material can be reviewed in advance of the presentation, such as described in the *Flipped Classroom Method*,[11] to help equalize audience knowledge and allow the

presenter to stray from a strict didactic presentation into a method incorporating higher cognitive methods. Even when using a more didactic style, active instructional methods should be incorporated throughout the presentation. Interactive techniques include the use of audience response systems, small group break-outs, brief problem-solving activities, task completion exercises, games, simulations, demonstrations, case-based learning, and simple integrated interactions such as think-pair-share, thinking hats, or role-play scenarios.[12-14] See Figure 3 for a more complete description of these methodologies. When learners are actively engaged and learning principles are utilized, the transfer of information is optimized.

Conclusions

Create effective and engaging presentations by focusing on the three fundamental components of every presentation: the message, the visuals, and the delivery. Key questions to help refine each of these components are summarized in Figure 4. As a final check, ask a colleague to provide peer feedback, or record the presentation for self-critique. Aim to incorporate these evidence-based yet practical tools into the next presentation to help transform it from ordinary to extraordinary.

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Figure 1: Six Principles of Sticky Ideas adapted from Heath and Heath, 2007.[15]

Six Principles of Sticky Ideas

1) Adhere to a *simple* core message

2) Intrigue the audience with the *unexpected* by exposing gaps in learners' knowledge or introducing clinical case presentations with unexpected outcomes

3) Provide *concrete* and immediately applicable pearls

4) Back the message with an evidence base (*credentials*)

5) Make the message compelling by triggering *emotion*

6) Embed the message in *stories* to provide a context for understanding the topic

Figure 2: Application of Mayer's Multimedia Principles to create effective visuals

Before **After**
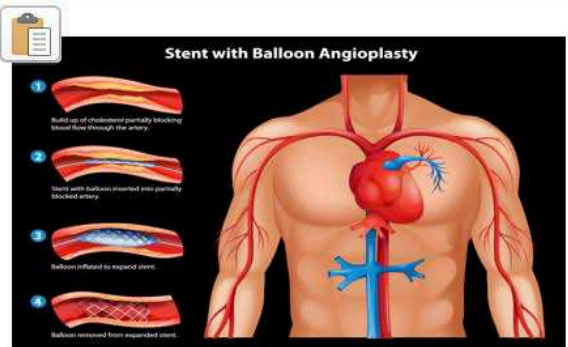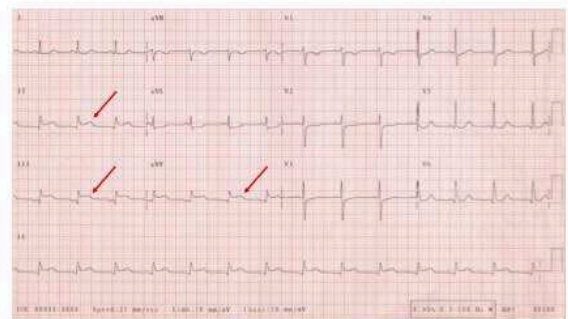
Figure 3: Active Learning Techniques adapted from Wolff et al., 2015, Graafland et al., 2012 and Stead, 2005

Technique	Description	Time

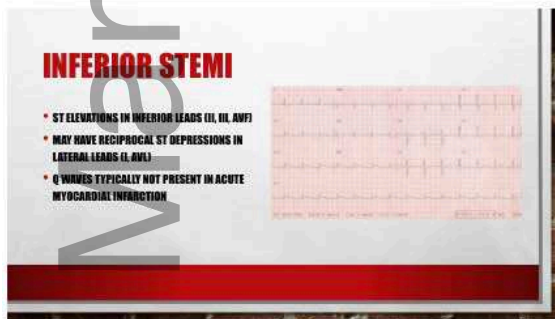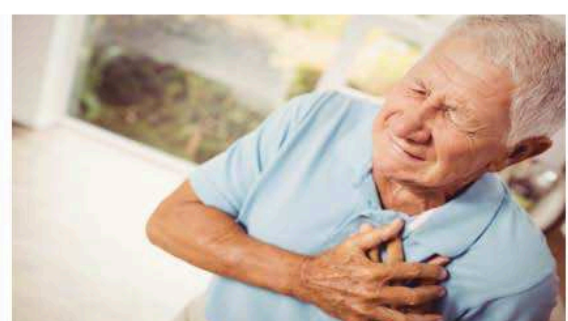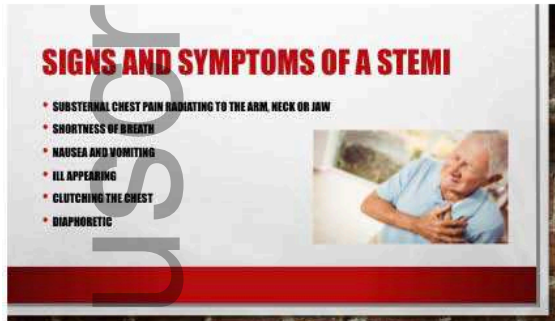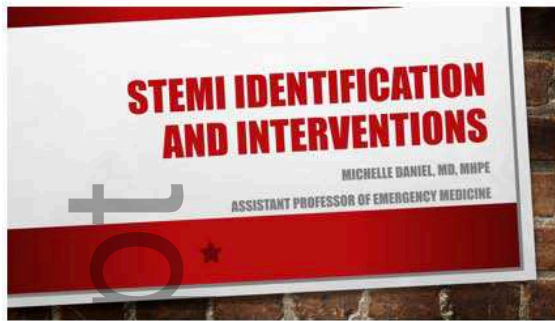|		
Audience Response Systems (ARS)	Use web- or clicker-based software to develop questions that relate to the learning outcomes. Intersperse these questions throughout the presentation for students to answer using clickers, computers, or phones. If there are technology constraints, have learners use colour-coded cards to respond to multiple choice questions in lieu of electronic response systems.	Short
Case-based Learning	Use a clinical vignette or case study as an introduction to the presentation. Alternatively integrate them into the presentation with discussion questions that learners can discuss as part of think-pair-share or clinical reasoning questions that learners can answer via audience response systems.	Short to Medium
Educational Games	Develop or use an existing game to reinforce and evaluate learner understanding of key concepts from the presentation. The game can be integrated into presentation, used during a review session, or assigned as homework. Games can range from simple quiz-bowl style to interactive web-based platforms.	Medium to Long
Experiential Learning	Pair simulations with didactic presentations. (i.e. Have learners practice setting up ECG leads during a presentation on administering and interpreting ECGs.)	Medium to Long
Jigsaw	Divide learners into small groups. Have each group answer one part of a question (i.e. What are the vascular, infectious, and traumatic causes of chest pain?) After a few minutes, divide learners into new groups with one expert from each original topic in every group. Allow time to teach each other about their topics.	Long
One minute paper (OMP)	Pose one or two questions for learners to reflect on a topic that was recently taught. Commonly in OMP, the questions are: 1) what is the most important thing you learned today and 2) what question is unanswered.	Short
Role Play Scenarios	Divide learners into small groups. Give each group a scenario to act out that is related to the presentation (i.e. Family meeting discussing a patient's transition to palliative care in the setting of advanced heart failure.)	Medium
Small Group Breakouts	Pose a case-based, task completion, or problem-solving question related to one of the key points. Have learners work with the people sitting near them to answer the question. Then, randomly call on several groups to share their responses.	Medium to Long

Thinking Hats	Pose a clinical scenario, ethical dilemma, or discussion question to learners (i.e. Should an IV drug user receive a second prosthetic valve after repeated bouts of endocarditis). Assign students different stakeholder "hats" (physician, nurse, patient, relative, etc) to represent in a discussion on the topic.	Short to Medium
Think-Pair-Share	Pose a question to the group related to the presentation (i.e. What is the differential diagnoses for a 60-year-old male with epigastric pain?) Allow time for learners to consider their responses individually. Then, have them discuss their responses in pairs. Finally, randomly call on pairs to share their response.	Medium

Figure 4: Questions to Refine the Message, the Visuals, and the Delivery

Message
- What are the 3-5 key points I want my audience to remember?
- How can I structure my talk to emphasize these points?
- How can I make my message stick to enhance retention?
- What does my audience already know about this subject?
- How can I activate their prior knowledge?
- What is my audience's motivation to learn?
- How can I tap into that interest?

Visuals
- What can I do to minimize distractions and clutter on my slides?
- How can my images support my core message?
- Are my images simple and high quality?
- How can I minimize text on my slides?
- Is the written text redundant with my oral presentation?
- What information should I include in my summary handout to facilitate effective individually paced review?

Delivery
- How is my stage presence (posture, eye contact, movement)?
- What types of expressive behaviour can I use in my delivery?
- Have I rehearsed enough?
- Do I have transitions built in at appropriate points?
- How can I integrate pauses to maintain learner attention?
- Where can I incorporate active learning techniques into my presentation?

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