Stem Case and Key Questions Content
As a junior faculty member with a succession of publications from your clinical research project during residency, you are delighted to receive an invitation from a prestigious Department of Anesthesiology to present your research at Departmental Grand Rounds as a Visiting Professor. After you accept the invitation, get approval for the time off, and book your ticket, the Chair reminds you via email that all Visiting Professors are expected to provide and moderate a PBLD for the residents before the Grand Rounds research presentation. You sense a growing feeling of dread rising up in you....

1. What is a PBLD or case-based learning?

2. What are the advantages of PBLD over traditional educational methods?
   Now that you have researched the PBLD concept and methodology, you begin to think of source material for your presentation. You review previous lectures that you have given to residents and a couple of case reports that you have published for PBLD ideas.

3. What are the basic components of the PBLD method?

4. What source material can be used for PBLD?
   You discover literature on the proper way to write learning objectives, which includes avoidance of common verbs that do not have measurable 'outcomes'. You enthusiastically begin the process, but somehow find that your case description fails to spark your interest when you review it later.

5. What are the characteristics of good learning objectives?

6. What are the characteristics of a good problem for case-based learning?
7. What are some common problems with case material for PBLDs?
You decide to look for a more interesting case, and review the Medically Challenging Case Submissions (case reports) from the previous national society meeting for ideas. After final preparations, you send your PBLD to the Chair for advance distribution to the residents.

8. How do you differentiate between material suitable for a Medically Challenging Case versus a PBLD?
You arrive for your PBLD at St. Ivory Towers University Hospital at 0600 sharp for your 0615 presentation. After reviewing the audiovisual setup for your PowerPoint slides, you observe 17 residents file in and take their places in the large conference hall. You occupy the stage behind the podium and begin by introducing yourself.

9. What are the hallmarks of an effective PBLD?

10. How does the physical setting of the teaching area affect the discussion?
The residents seem reluctant to offer any answers to your invitation to summarize the problem and list the main clinical management issues. You are wary of directly questioning individual residents for fear that you might be viewed as ‘picking on them’ by employing the Socratic style of questioning.

11. What are the essential skills for successful moderation of a PBLD?
After some more painful stretches of silence, one resident who arrived a few minutes late begins to offer answers in response to your questions. You breathe an internal sigh of relief, and feel more engaged with the group. However, after some more general questions, you realize that this resident is now dominating the discussion, and the rest of the group appear content to let her do most of the talking. You begin to direct your questions to groups of residents scattered around the lecture hall, but find it difficult to get everyone to engage, especially with the one resident who eagerly offers answers to almost all your questions.
You decide to remedy this by inviting opinions on the ethics of performing the surgical procedure on the terminally ill elderly patient in your case. This results in several vociferous opinions from previously quiet residents and a heated discussion. It proves difficult for you to redirect, and you run out of time to tackle the remaining learning objectives.
As you prepare for your Grand Rounds presentation, you are left with a nagging feeling that things didn’t go too well.

12. What are some of the pitfalls awaiting the uninformed PBLD moderator?
You resolve to become better at being a PBLD moderator, and decide to submit your case to the American Society of Anesthesiologists (ASA) Annual Scientific Meeting for practice.

13. Why should you try to present a PBLD at your specialty society annual meeting?
Model Discussion Content
1. What is a PBLD, or case-based learning?
Problem-based learning differs from traditional learning in that the primary focus is to challenge students by giving them a real world problem to solve, thereby introducing concepts as the solution is teased out of the fabric of the initial problem. Problem-based learning uses a problem to motivate, focus, and initiate student learning. It was pioneered over 30 years ago by McMaster University Medical School in Hamilton, Ontario, and has been successfully implemented in the curricula of schools and universities around the world in a variety of disciplines.

2. What are the advantages of PBLD over traditional educational methods?
PBLD is more likely to be successful at making students acquire and retain information and apply the information in real-world problems. It is more likely to stimulate critical thinking, and it challenges students to work cooperatively as well as independently, and it encourages reflective thinking on their own and fellow students’ learning styles.

3. What are the basic components of the PBLD method?
The basic components are a problem statement, 3-5 learning objectives, key questions, a model discussion, and references. These will be covered in more detail in the relevant sections.

4. What source material can be used for PBLD?
Source material for a PBLD is often an interesting case, though not simply a rare syndrome and/or unexpected complication that was managed with a good outcome and no avenues for discussion or controversy. Source material may also be drawn from professional, legal, or ethical issues; these types of PBLD submissions are often harder to write or find, despite being a key element of medical and competency-based residency educational programs. These categories of offerings may also have a greater chance of being accepted at medical society meetings. Controversial issues from review articles or guidelines can also provide engaging PBLD material for student or resident curricula.

5. What are the characteristics of good learning objectives?
A learning objective is a statement that describes the knowledge, skills, and/or attitudes that participants will gain from the activity. For each learning objective, teachers must ask 3 questions about the participants:
- What should the result of this activity be for them?
- What should they be able to do?
- What should they know?
An internet search will reveal hundreds of sources for understanding how to write good objectives; one succinct example is from Tulane University.
http://tulane.edu/publichealth/mchltl/upload/Tips-for-writing-goals-and-objectives.pdf (accessed 02/08/16)

6. What are the characteristics of a good problem for a PBLD?
For problem-based learning to be successful, the problem must be effective and interesting. It should engage the learners' interest and motivate them to probe deeper to understand concepts being discussed. It should relate to the field of interest so the learners have a personal stake in being able to solve the problem. Good problems also require participants to make decisions or judgments based on facts and reasoning, and compel them to justify their decisions based on prior knowledge or logical assumptions. Typically, questions in the problem should be open-ended, connected to previous knowledge, and be able to elicit diverse opinions. In addition, good problems should stimulate higher-level critical thinking such as analysis, synthesis, and evaluation of concepts.
Developing a PBLD case from an interesting problem requires thought and organization. The case should roughly follow an outline based on the educational objectives; it is, therefore, important to address objectives at an appropriate point in the discussion. Each paragraph should have a limited number of pieces of information (2-3) and should be brief (3-4 sentences). Cases should include demographic and real-world detail to be realistic. Effective cases often have clues or specific pieces of information that raise questions or hypotheses. In addition, issues that have multiple potential solutions present the best opportunities for evaluation of alternative approaches to the problem and application of existing knowledge in choosing the optimal course of action. Prioritization of issues presented in the case may be obvious, or can be left to the learners as an additional method of approaching the issues posed by the case.

7. What are some common problems with case material for PBLDs?
One of the essential components of the case material for discussion is that it should be delivered to the participants well in advance of the session. This allows them to review the material, connect new information to existing information, and formulate some personal learning goals that the session will hopefully be able to address. It is difficult to have a good discussion if participants have not received the material ahead of time, or have not bothered to review it before the session.
• ‘Zebras’ - once in a lifetime case
• “Look how well we managed this rare event”
• Poorly written objectives
• No avenues for productive discussion
• No controversy
• No decision-making required
• No twists and turns
• No gradual revelation of case details
• Uninteresting; lack of engagement / relevance
• Case does not follow objectives
• Too many problems or objectives
• Poorly written: typos, bad grammar, unqualified abbreviations, factually incorrect, inflammatory
• Poor selection of references

8. How do you differentiate between material suitable for a Medically Challenging Case (MCC) versus a PBLD?
Material suitable for a MCC (case report) typically entails successful management of a difficult case or rare syndrome, with little in the way of controversy or decision points during the management. Often there is little or no discussion of broader topics pertaining to the case, and no opportunity for learners to engage in higher-level assimilation, analysis, and application of learned material.
PBLD material engages, tells a story of interest, and may be awash with controversy; learners are confronted with multiple crossroads or twists and turns in the evolution of the case, which force learners to draw on knowledge and experience to solve the issues presented, thus engaging in higher-level thinking.
Medically challenging cases (case reports) are often accepted for presentation at national meetings to encourage learners of all levels (students, residents, fellows, attending) to present interesting medical conundrums or novel treatments at a national forum to peers and experts in the field. The decision to convert a MCC into a PBLD for presentation at a national meeting typically requires greater in-depth knowledge, and is therefore commonly attempted by senior residents or fellows and attending.

9. What are the hallmarks of an effective PBLD?
The hallmarks of an effective PBLD are participant-led learning in a collegial, non-confrontational environment guided by the moderator. The discussion is enhanced by adequate review and preparation of the material in advance by participants, and by analytical, probing, or reflective questions by the moderator. The discussion must include all participants, and should not be dominated by one or a few dominant individuals.

10. How does the physical setting of the teaching area affect the discussion?
The physical layout of the teaching area profoundly changes the dynamics of the discussion. A lecture hall is a challenging setting in which to conduct small group discussions, as the presence of a stage, speaker’s podium, and chairs arranged in rows sets up learners’ expectations to anticipate ‘another lecture’, stifling active discussion. Ideally, the chairs should be arranged in a circle or semi-circle around a table, so participants can have face-to-face discussions. The moderator may choose to sit or stand, but should try to refrain from assuming a position of authority such as by standing in front of a seated group. Less ‘authoritative’ options would be to sit at the table, though not at the head of the table, or to sit at the side or behind the group.
The use of audiovisual aids such as PowerPoint further reinforces the ‘lecture’ mindset for the presenter and the participants. If used at all, they should serve to enrich specific points in the
discussion with diagrams, photographs, or algorithms, rather than as an aide-memoire for the moderator to lecture the participants.

The size of the group is important. In this scenario, the 17 participants would ordinarily be considered too large for a traditional PBLD, where typical group sizes range from 6-12 participants.

11. What are the essential skills for successful moderation of a PBLD?
A successful PBLD moderator facilitates learning by possessing relevant knowledge that includes the philosophy and benefits of case-based learning, the structure of PBLD, the process of critical thinking, and the objectives of the discussion. In addition, the moderator must exhibit skills to guide the students while emphasizing student-centered discussion; motivate all students to participate; question and probe to establish appropriate depth of knowledge; have knowledge of the subject matter and contribute through appropriate, timely input; keep participants on track by distinguishing the main learning objectives of the discussion; demonstrate enthusiasm, and provide a pleasant, productive and collaborative learning environment with good group dynamics.

- Sends the study material to participants for review in advance of the session
- Studies the material in advance and prepares for ‘tangential’ questions and discussion areas
- Introduces self and participants to each other
- Opens discussion with a non-threatening question that should be familiar to everyone
- Avoids being a content expert
- Does not lecture or give a ‘talk’
- Involves all participants
- Incorporates different practice settings
- Does not lead the discussion by questioning participants about factual details of the case
- Encourages higher-level learning with analytical, probing, or reflective questions
- Allows time for reflection and thinking after a question
- Keeps the group focused
- Guides the discussion through the objectives
- Controls the dominant participant
- Engages the quiet participant
- Has some interesting historical or cultural tidbits to engage interest
- Has some general queries for the group to vote on
- Maintains a pleasant, collaborative learning dynamic
- Keeps track of time
- Summarizes the key points of the discussion at the end

One of the challenges for the moderator that is worth highlighting is to resist the urge to prod the discussion along in the early tentative stage by continuing to speak; it is imperative that moderators begin the session by encouraging everyone to participate at an early stage by passing around the opening, non-threatening question/s that should have an identifiable context; this sets the expectation right at the beginning that the participants will be doing the talking, not the moderator. This is a difficult
behavior to cultivate, particularly for novice moderators, especially when they are used to lecturing. It takes awareness and a conscious effort on the moderator’s part to keep silent and encourage participation by having a few suitable opening questions prepared in advance.

Some examples of such questions could be:
A. Ask participants to introduce themselves, what they do, and where they work/study (if a new group).
B. Ask participants about their level of experience with the case or condition being discussed.
C. Ask participants how such cases are usually managed in their home institution.
D. Ask participants what their prior experience of attending or moderating PBLDs has been like.

12. How can you avoid some of the pitfalls awaiting the uninformed PBLD moderator?
   • Don’t fail to prepare
   • Don’t forget introductions and ice-breakers
   • Don’t forget to use a seating chart and names
   • Don’t start with a closed-end question
   • Don’t discuss emotional material until the end
   • Don’t forget to use the flip chart effectively
   • Don’t forget to call on the quiet people
   • Don’t allow domination by 1-2 individuals
   • Don’t forget to listen and respond to students
   • Don’t forget to correct factual errors

13. Why should you try to present a PBLD at your specialty society annual meeting?
Presentation of a PBLD at a specialty society meeting is a significant achievement. The acceptance rate at the national society meeting for Anesthesiology is roughly 40%-50%. Acceptance usually ensures priority to attend the meeting, opening up many other educational and networking opportunities. Presentation at a national or international society meeting counts towards academic promotion, especially for faculty in an educational track.

Residents who are able to present at such meetings will learn much from the experience, and it is a highlight that fellowship programs and academic departments value in prospective candidates. However, not all societies allow residents to be an author (primary or otherwise) and/or present PBLDs at national meetings. Successful PBLDs can be presented during a visit to other departments, or to your own department trainees. In addition, opportunities to gain additional educational kudos may be realized if the PBLD is accepted as a peer-reviewed MedEdPortal publication (www.aamc.org/mededportal). The American Society of Anesthesiology (ASA) allows PBLDs that have been presented at the Annual Scientific Meetings to be published on MedEdPortal as long authors obtain written permission from the ASA in advance; this is also required by MedEdPortal.
Residents and fellows are the medical educators of tomorrow. It is important for them to acquire skills required to develop and moderate successful case-based learning strategies for incorporation into the medical or residency curricula of the future.

References