

Enhanced Team Based Learning Facilitation Utilizing Neurology Residents

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Background:

Much has been written about the benefits of Team Based Learning (TBL) in medical education. TBL usage has increased in medical schools and have led to improved academic performance in certain circumstances.^{1,2} One of the advantages of TBL is its reliance on a small number of content-expert facilitators for large groups of students. Little is available in the literature about using expanded groups of content experts to facilitate TBL sessions. One previous description of using residents to teach medical students using TBL had them act in the role of the sole facilitator.³ The effectiveness of embedding a large group of residents in the TBL room as co-facilitators has not been reported.

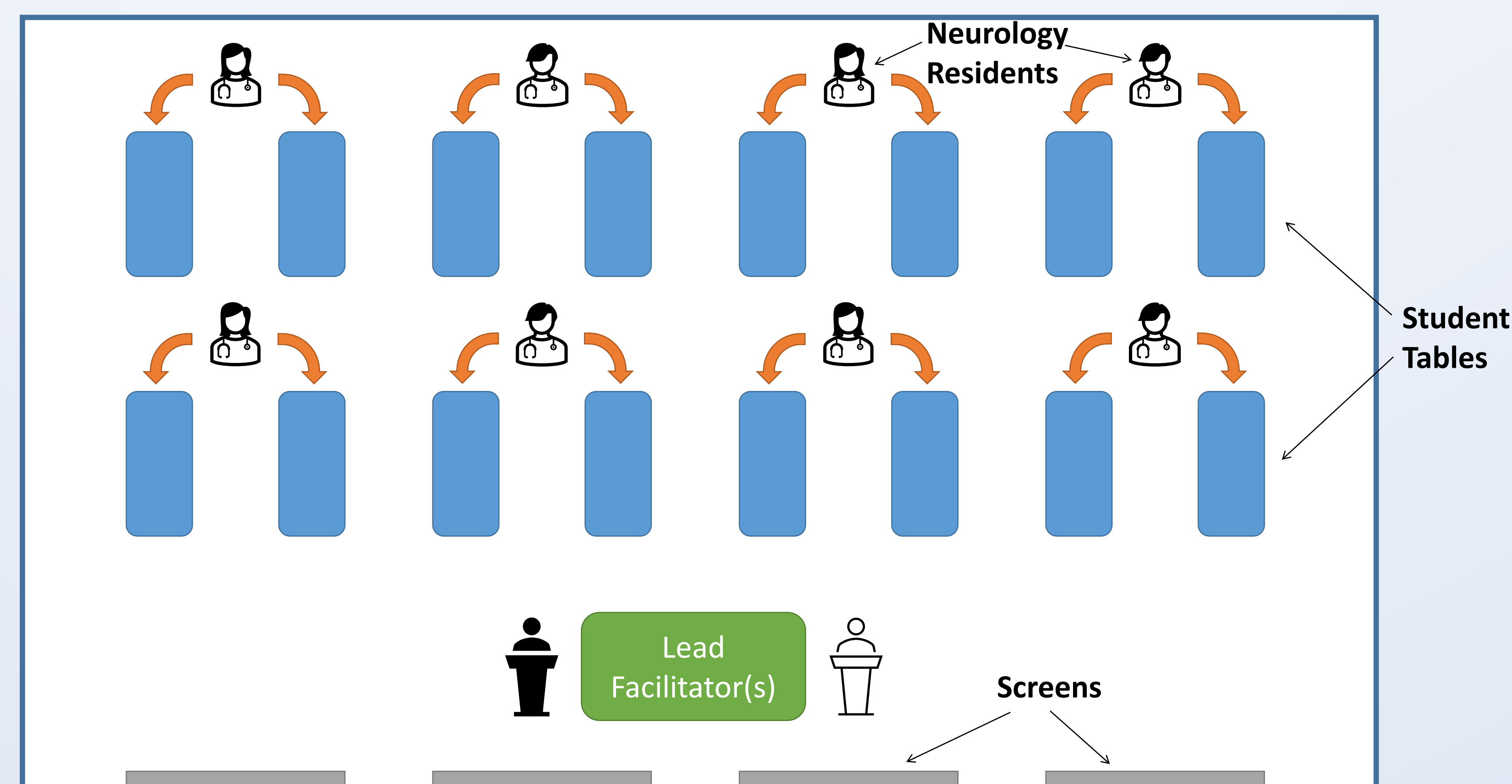
Our efforts center around finding an effective way to leverage the availability of a relatively large group of **content experts** (PGY3 neurology residents) to enhance the learning of the second-year medical students during the neuroscience TBL sessions. We believed that the additional content-experts in the room would help within-group discussions by answering content questions or providing guidance to struggling groups.

Methods:

Developed 3 TBL sessions for approximately 180 M2 students in **Block 6: Cognitions, Sensation, and Movement**

- Topics: **Neurotransmission, Stroke Management, Brainstem Neuroanatomy**
- Led by 13 **PGY3 neurology residents** and 2-4 faculty.
- Each resident was assigned to 2-3 student tables (**Figure 1**)
- In writing and developing the new TBL cases, we followed the traditional format for TBLs for two of the sessions (Neurotransmission, Stroke) and a modified format for the last session (Brainstem).
- **Traditional format** (Neurotransmission and Stroke Management):
 - Started with Individual/Group Readiness Assurance Tests (IRAT/GRAT)
 - Followed by multiple-choice application questions
 - Residents guided students by asking probing questions, providing clinical pearls, and clarifying important concepts
- **Modified format** (Brainstem Neuroanatomy):
 - Started with Individual/Group Readiness Assurance Tests (IRAT/GRAT)
 - Residents and faculty led small groups of students through a series of freeform discussion questions on 4 clinical cases.
 - Each facilitator was given a set of slides with cross-sectional diagrams and longitudinal pathways to aid in their explanations
 - Each clinical case conclude with a final discussion with the lead facilitator of the session.
- Residents were trained in a dedicated session before each TBL
- Most residents were not previously experienced with TBLs

Figure 1: TBL Room Organization



Results:

Success was measured through:

- collection of ratings and feedback from the students
 - just-in-time feedback
 - end-of-block feedback
- End of Block Survey Results (0 – 5 Scale, 77 respondents):
 - **Neurotransmission TBL** **3.7**
 - **Stroke Management TBL** **4.1**
 - **Brainstem Neuroanatomy TBL** **4.1**
 - **Educational effectiveness of the neurology residents in TBL** **4.3**
- For comparison:
 - Overall quality of this Block 4.0
 - Neurology/neuroscience section overall 4.1
 - Neurology/neuroscience lectures 4.0
 - Neurology/neuroscience IQ cases 4.0
- More revealing were the many comments from students on the unique way we approached TBL in the neuroscience portion of the block. The overwhelming majority of these comments were positive with some representative examples in **Table 1**.
- However, not all feedback was entirely positive. The main theme of the constructive feedback was regarding the non-uniform experience between some groups.

Table 1: Qualitative Comments from End of Block Survey

Positive Comments
"The residents served as a really nice resource and allowed me to understand the material better since I could ask them individualized questions."
"These TBLs were way better than past...I also can't state enough how cool it is that neurology residents participated in so much of our curriculum overall; all blocks should consider involving residents whenever possible."
"In my opinion, these were the best TBLs we had. Having multiple residents to answer questions was great. The quality of the teaching was also fantastic."
"I think having the residents provided a great opportunity to have focused teaching and interactions that greatly helped with overall understanding."
"I really enjoyed the format of having the residents lead 2 groups of students through the cases. It really helped to discuss it within smaller groups with more guidance, especially for complex stroke cases, before getting key takeaway points from the large group."
"The neurology TBLs were an excellent addition to the block and it was extremely helpful to have so many residents present to answer questions and help facilitate and teach us. I would recommend that this structure be incorporated into the other 5 blocks as well."
Negative Comments
"The neurology TBLs were great in general - however, I felt that students had different experiences with the brain stem TBL because some neurology residents were great teachers while others were unhelpful."
"My resident was very helpful in walking us through the cases, however I did hear that some groups did not have useful residents and they were very confused during the session."

Future Directions:

- For the future, we plan to keep the general format of the TBLs the same.
- To better ensure uniformity between the residents as teachers, we will focus additional preparatory training to the residents on not just knowledge, but also effective teaching methods.
- Due to COVID-19 and remote-only instruction, we had the residents "circulate" between the TBL small groups by switching between breakout rooms in Zoom.

Summary:

- We present a way to enhance TBLs by leveraging the clinical knowledge and availability of residents.
- We created a series of TBL sessions within the pre-clinical neuroscience curriculum that embedded PGY3 neurology residents within a larger group of second year medical students in order to enhance the availability of content expertise.
- Students reported a significantly improved TBL experience due to the presence of the residents.

References:

- ¹Thompson, B.M., Schneider, V.F., Haidet, P., Levine, R.E., McMahon, K.K., Perkowski, L.C. and Richards, B.F. (2007), Team-based learning at ten medical schools: two years later. *Medical Education*, 41: 250-257.
- ²Koles, Paul G. MD; Stolfi, Adrienne MSPH; Borges, Nicole J. PhD; Nelson, Stuart PhD; Parmelee, Dean X. MD The Impact of Team-Based Learning on Medical Students' Academic Performance, *Academic Medicine*: November 2010 - Volume 85 - Issue 11 - p 1739-1745
- ³Ravindranath D, Gay TL, Riba MB. Trainees as teachers in team-based learning. *Acad Psychiatry*. 2010 Jul-Aug;34(4):294-7.