

# Health Professions Education Institute (HPEI)

**Title:** *A 3rd Year Medical Student Curriculum for Transcranial Magnetic Stimulation*

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## WORKS IN PROGRESS

### *Background/Needs Assessment:*

Transcranial Magnetic Stimulation (TMS) is a non-invasive treatment for depression that involves placing an insulated coil over a patient's scalp and inducing an electromagnetic field in specific areas of the brain. Brief magnetic pulses pass through the brain, like the type and strength used during an MRI. The patient does not require anesthesia or sedation and the procedure is done on an outpatient basis. TMS can be particularly helpful for treatment resistant depression.

However, TMS is a relatively new treatment modality, having been FDA approved in 2008 and given mainstream treatment status by the American Psychiatric Association in 2010. TMS may not be as readily available as Electroconvulsive Therapy (ECT) in some locations, so medical students may not have the opportunity to learn about TMS and observe a TMS treatment session. This is a disadvantage because TMS is becoming a widely accepted form of treatment and medical students should have a basic knowledge and exposure to it.

There is very little in the medical literature about teaching TMS to medical students. One curriculum by Junao Wang and Brent Nelson on *MedEd PORTAL* (2018 Apr 27;14:10713) presents an interactive self-directed learning module on TMS for psychiatry residents. There is no direct exposure to an actual TMS session.

The Clinical TMS Society, an international association dedicated to promoting awareness and accessibility of TMS, offers a slide presentation on TMS available to medical students and residents, but again, this is self-directed does not appear to include a live patient encounter.

The Association of Directors of Medical Student Education in Psychiatry (ADMSEP) has identified brain stimulation techniques as one of the clinical learning objectives for medical students in psychiatry. TMS, a type of brain stimulation technique, is therefore considered essential knowledge for medical students. Yet, there are not many curricula that provide didactics and a live patient experience.

Atrium Health-Behavioral Health Charlotte is fortunate in that we have a very robust interventional psychiatry service. Students already observe ECT, but they do not observe the TMS treatments provided by specially trained psychiatrists on this service. This creates a knowledge gap for the medical students, who will likely encounter questions about TMS on the NBME specialty exam in

psychiatry and who may encounter patients who could benefit from TMS. Providing medical students with didactics on TMS and an observational experience will help to address this gap.

### *Objectives:*

The purpose of this project is to address the knowledge gap of transcranial magnetic stimulation (TMS) and to improve medical student education in psychiatry. This will be done by developing a curriculum that educates 3<sup>rd</sup> year medical students on the concepts of TMS via didactics and a live patient encounter on the TMS service. The curriculum will be based on existing knowledge on TMS as well as the expertise of our TMS faculty psychiatrists.

### *Methods/Description of Program:*

We will use the text *Curriculum Development for Medical Education* by Thomas et al., which provides a six-step approach to development of this curriculum:

1. Review of existing literature and general needs assessment—the most important topics within TMS and best teaching strategies will be determined by a general needs assessment via the Nominal Group Technique with the TMS faculty.
2. Targeted Needs assessment—medical students who have completed the psychiatry clerkship will be sent an anonymous online survey via Survey Monkey. Not only will this determine additional topics that students feel are relevant, but it will also assess learner's attitudes toward TMS as well as any prior experience with TMS. Best learning methods will also be asked of the learners during this targeted needs assessment.
3. Development of Goals and Objectives—all goals and objectives will be measurable and will assess cognitive and affective domains.
4. Determining the content of the curriculum and determining the educational methods that will be used to deliver the curriculum—the content will come from the general and targeted needs assessment. The best methods of teaching will be determined by the results of the targeted needs assessment.
5. Implementation of Curriculum—we anticipate that the curriculum will be required faculty involvement in both the didactics portion and the clinical portion. Faculty and residents will facilitate the didactics by whatever method has been identified as the most valuable by the learners and faculty will direct the teaching that occurs during the procedure. The curriculum will be delivered to students during their psychiatry clerkship at Atrium Health.
6. Evaluation—In this phase, the evaluation questions will be identified, and we will ensure that they are specific to the curriculum objectives. We anticipate using pre-test and posttest evaluations. This method will allow us to demonstrate the students' changes in their knowledge from before the curriculum. As far as statistical methods that will be used to evaluate the evaluation data, descriptive statistics appear to be the most reasonable type of method as these types of statistics will be helpful to answer any questions about the learner's perceptions of change in their knowledge base.

This project will change the way we teach medical students in that it will add a new topic to an existing psychiatry clerkship and give medical students that rotate through Atrium Behavioral Health additional knowledge of a treatment modality that is gaining more widespread use.

We have completed the first step of the curriculum development. At this time, we have just started the second step of the targeted needs assessment. We are sending faculty and medical students who have completed the psychiatry clerkship at Atrium Health an anonymous survey regarding prior experience with TMS, ranking of the importance of identified topics in TMS and ranking the best methods of instruction for the material.

The Atrium Health IRB has designated this project as a Quality Improvement project.

*Anticipated Results/Evaluation Plan:*

The results of our targeted needs assessment survey will give us a better idea of who our stakeholders are in this project—3<sup>rd</sup> year medical students and psychiatry faculty. We will understand what the stakeholders believe the most important topics within TMS are for the psychiatry clerkship and we will know what teaching methods to utilize to teach TMS.

Data from the targeted needs assessment survey and the pre and posttest evaluation surveys will be collected anonymously via Survey Monkey and will be kept on file electronically.

*Next Steps:*

After the targeted needs assessment is completed, we will proceed with steps 3-6 as described in the Methods/Description of the Program section above.

In our opinion, this project is readily sustainable as it does not require additional personnel or resources: we already have TMS training psychiatrists who are willing to teach medical students and we already have a TMS service.