An Interactive, Video-Based, Online Curriculum in Movement Disorders for Neurology Housestaff: A Pilot Study

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OBJECTIVE
To assess neurology housestaff response to and knowledge acquisition from a novel module-based curriculum in movement disorders.

BACKGROUND
The Problem:
• Limited outpatient exposure
• Limited resident interest in movement disorders as a subspecialty: in 2017, 47 applicants applied for 62 fellowship positions

The Status Quo: Lectures
• Poor lecture attendance
• Failure of lecture to temporally correlate with clinical exposure
• Short attention spans1
• Variable learning styles, levels, and paces of learning
• Millennial learners put less value on passive exchange of information2

The Proposed Solution:
• Creating a module-based curriculum that is:
  ✓ Standardized: same for everyone
  ✓ Authentic: uses real patient videos
  ✓ Interactive: embedded Q&A
  ✓ Multimodal: visual, auditory, kinesthetic
  ✓ Flexible: usable at any time, on any device
  ✓ Accessible: easy to disseminate online

METHODS
Curriculum Design and Development:
• An original structured framework of an approach to movement disorders was developed by author SMS. An introductory video was made based on the structured framework (Figure 1).
• 10 module created: hemifacial spasm, essential tremor (ET), myoclonus, dystonia, Parkinson’s disease (PD), ET-PD, progressive supranuclear palsy, chorea, functional, and tics.
• Original patient videos were recorded, with consent.
• Camtasia®, Powerpoint®, Pixlr®, and Synfig Studio® were used to create ~120 videos with a variety of illustrative features (split screen, voiceover, arrows, etc.) (Figure 2).
• Multimedia content, questions, and conditional answers were inputted to build modules on the Qualtrics® platform (Figure 3), leading the learner through:

Study Methods:
• Mixed methods design
• 9 neurology housestaff (3 PGY-5s, 2 PGY-3s, 4 PGY-2s) volunteered for the study
• Format of the study as follows:
  10 Question Pre-test
  10 Question Post-test
  Modules Survey
  Semi-structured interviews

• Survey questions were clustered by category (Figure 4), and Likert scores assigned a value 0-5.
• Semi-structured interviews were performed until saturation was reached, transcribed, coded, and probed for themes

RESULTS
• 8/9 housestaff completed all modules
• 6/9 housestaff completed both pre- and post-tests: respective scores 0.7 (+/- 0.19) to 0.95 (+/- 0.05) (p=0.022)
• 6/9 housestaff completed the survey: mean Likert scores were >4/5 for all questions and >4.5/5 for all categories (Figure 4)
• Themes from semi-structured interviews with illustrative quotes:
  Increased level of comfort with the topic
  “I saw a movement I had to think about was it hyperkinetic, hypokinetic, these are terms that all made sense, I had not thought about it in an organized... process like that before. …And I feel more confident.”

  Format was engaging
  “It was like actually kind of fun to learn.”

  They liked that it accommodated different learning styles
  “Having it in multiple modalities... you’re reading this screen/this whatever, you’re hearing it read to you, there’s videos to show you ... reinforce the written description, and then there’s... the interactive component where you’re answering questions and getting an explanation as to why it was right or wrong, so I think that it’s really good for a busy resident.”

Residents additionally commented that they wanted more:
  “I don’t think the number of modules should necessarily be limited.”
  “Would expand.”

CONCLUSIONS
• Housestaff responded well to the format of the modules. They felt they were multimodal, fun, and intuitive.
• Housestaff both subjectively and objectively learned from the modules, by survey and pre- and post-testing.
• Housestaff often commented that they wanted the modules to be expanded, both within movement disorders and in other neurological subspecialties.

FUTURE DIRECTIONS
• We are conducting a multi-center randomized controlled trial at 12 neurology residencies to evaluate the efficacy of the modules in different residency environments.

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To see the modules, visit: http://movementmodules.yale.edu/