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FEATURE: EDUCATIONAL CASE REPORT

Empowering Clinician-Educators with Chalk Talk Teaching Scripts

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Overcoming Barriers to Teaching Medical Students

Even among highly motivated clinical educators, there are numerous barriers to providing high-quality teaching to medical students. Time is a frequently cited barrier [1, 2]; the preparation of teaching materials, execution on a lesson plan, and incorporation of feedback integral to high-quality education are often viewed as requiring extensive amounts of time [3]. Another barrier is lack of understanding of the learner's specific educational needs or areas of growth: it can be hard to identify exactly what to teach to a specific learner [4, 5]. Deciding how to teach is similarly important because it is not always clear whether a structured framework or an on-the-fly discourse is most effective [6]. Finally, and especially among residents or early-career educators, lack of confidence in one's ability to teach a subject can be a barrier to success.

One oft-employed method of instruction is the chalk talk. This is typically a contained, interactive, and flexible format in which a teacher uses a mix of brief talking points and diagrams drawn on a white board to teach on a topic encountered clinically during the team's work [7]. But how does an educator learn how to fill the white board? Irby [8] has shown that highly effective clinical teachers have internalized "scripts" that include pre-planned teaching points, strategies for working through content, and approaches to reduce the "cognitive load" of the teacher by "accessing richly elaborated and tightly connected schema." Marcdante and Simpson [9] have found that experienced clinical teachers have substantial overlap in their use of internalized teaching scripts. Educators in other specialties have taken the idea of internal scripts and written about the creation of physical scripts—written documents that include a trigger for discussion (e.g., "A patient presents with pneumonia"), a key teaching point (e.g., "judicious choice of antibiotics"), and a teaching strategy (e.g., "work through the various pathogens and pair them with appropriate antibiotics"). In a workshop with pediatricians, creating physical scripts was felt to be time and resource efficient [1].

To our knowledge, previous work has not looked at whether teaching scripts would facilitate the delivery of chalk talks in busy clinical psychiatry settings. This work is especially important for helping to develop and empower early-career educators, for whom there is an unmet need [10]. We created a collection of curated teaching scripts on key topics in psychiatry, with the explicit goals of reducing barriers to clinical teaching, empowering residents and early-career educators, and improving learning experience for medical students

Development and Implementation of a Novel Curriculum of Chalk Talk Teaching Scripts

We felt that it was important to have consistency within the design of these scripts to facilitate ease of use. To that end, we instituted three rules for creating scripts. First, we require that each script must contain three sections: hook, approach, and content. This method was developed by reviewing other teaching scripts, especially as described by Lang [1], and refined with a trial-and-error approach. The hook is one or two short sentences about how to set up the talk in a way that could grab the interest of the audience. The approach is then meant to be a brief explanation of how the teacher should proceed through the material. Finally, the content represents the material itself, both the teaching script and the physical layout of what should be written on the white board. Second, the script has to have an accompanying handout for the student to use during the teaching. This handout is essentially a blank outline of the teaching session, containing the headings but not the content (e.g., for antipsychotics, the handout includes the columns "1st Generation" and "2nd Generation" and the rows "Mechanism," "Side Effect," and "Examples"). The handout,

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which encourages note-taking, helps to organize how the student encodes the lesson [11] and keeps the student engaged in the session. Lastly, the scripts had a maximum length of one page. This length was chosen to encourage the teacher to prioritize teaching points and key material and to minimize use barriers. Figure 1 shows an example teaching script.

Authors PC, EJ, and DF drafted the first 16 teaching scripts for this educational curriculum. Topics chosen fit into the broad categories of medications, diagnosis, interviewing, and other, as delineated in Table 1. The scripts were then pilot tested with resident teachers and medical student learners on a medical psychiatry unit at Massachusetts General Hospital (MGH) and a psychotic disorders unit at McLean Hospital. During pilot testing, feedback was solicited from the medical students after each session, and the teacher of each session also submitted written feedback about how the session had gone using the script. The script writers then used this feedback and feedback from faculty members to improve the scripts.

To generate interest in using the scripts, we held two workshop sessions with residents (first, residents in the clinician-educator program track at MGH/McLean and then during orientation with the entire incoming class of 16 interns). During these interactive sessions, we discussed barriers to teaching, introduced the concept of chalk talk teaching scripts, and had residents practice using an existing teaching script and creating their own teaching scripts. Finally, to make the project

Fig. 1 Chalk talk teaching script for personality disorders

Hook: Personality disorders are an interesting facet of psychiatry that allow us to use broad strokes to classify certain pervasive personality types that are inflexible/impairing. In other specialties, you will see these often-frustrating patients and now will be able to put a label to what you are seeing.

Approach: Start with a definition with emphasis on the underlined words and then work your way through the clusters, perhaps offering a sample patient narrative for each one. Would write out the table and make it clear that the buckets are mainly for categorization purposes. Everything below the table is for fun and to reinforce learning. Use your own favorite celebrity/pop culture examples!

- What is a personality disorder? An enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to distress or impairment.
- How do we group the personality disorders? *Clusters!*

Cluster A *'Odd/Eccentric'*	Cluster B 'Dramatic'	Cluster C *'Anxious/Fearful'*
Paranoid: distrust and suspiciousness such that others' motives are interpreted as malevolent. **Schizoid**: detachment from social relationships & restricted range of emotional expression. **Schizotypal**: acute discomfort in close relationships, cognitive or perceptual distortions, and eccentricities of behavior.	**Antisocial**: disregard for, and violation of the rights of others. **Borderline**: instability in interpersonal relationships, self-image, and affects, and marked impulsivity. **Histrionic**: excessive emotionality and attention seeking. **Narcissistic**: grandiosity, need for admiration, and lack of empathy.	**Avoidant**: social inhibition, feelings of inadequacy, and hypersensitivity to negative evaluation. **Dependent**: submissive and clinging behavior related to an excessive need to be taken care of. **Obsessive-Compulsive:** preoccupation with orderliness, perfectionism, and control.

Can You match these Pop Culture Examples?*

*Note that examples represent stereotypes rather than actual pathology

Willy Wonka (Schizotypal) Squidward/Dexter (Schizoid), Walter White/House (Narcissistic), Choose-a-Serial-Killer (Antisocial), Derek Zoolander (Histrionic), Buster Bluth (Dependent), Hermione Granger (OCPD)

Compare and Contrast

1) Schizoid vs Avoidant: Schizoid has no desire for social relationship, avoidant wants but feels inadequate
2) OCPD vs OCD: OCD thoughts are ego-dystonic (in contrast with one's ideal self-images), OCPD are egosyntonic, and thus distress/anxiety not part of OCPD
3) Paranoid PD vs schizophrenia: Paranoid PD no hallucinations, no negative symptoms

Buzzwords

'Magical Thinking': Schizotypal 'Center of attention': Histrionic 'Sociopath': Antisocial
'Black and white' or 'all or nothing' thinking or 'splitting': Borderline (Treatment = DBT)

Table 1 Initial 16 teaching scripts listed by category

Medications	Diagnosis	Interviewing	Other
Antidepressants	Mood and anxiety disorders	Bedside cognitive assessment	Legal status
Antipsychotics	Psychotic disorders	Catatonia exam	Risk assessment
Medication assisted therapy: alcohol use disorder	Personality disorders	Motivational interviewing	Discharge summaries
Medication assisted therapy: opiate use disorder		Psychiatric review of systems	Homelessness—best practices
Mood stabilizers			

most widely accessible, we created a website (www.teachingscripts.com) and made the scripts available to download for free.

Early Feedback and Results

We collected preliminary quantitative feedback by asking residents who utilized the teaching scripts to provide brief written feedback. On seven of the nine talks in which feedback was solicited, the resident teachers reported feeling increasingly confident in their abilities to give a talk on that subject matter, and on eight of nine talks, as more likely to teach this topic again to students.

Qualitative feedback from our initial implementation has also been positive. Medical students were given the opportunity to provide anonymous feedback about the teaching they received. Comments from two individuals are excerpted below:

> The resident-led chalk talks have been engaging, efficient, and high-yield. I particularly have appreciated how interactive the talks have been (with question-and-answer style talks as well as structured handouts for us to fill out), and how the residents actively probed our existing fund of knowledge.

> Our other lectures on the rotation are 1 hour long and are not as efficient at delivering information. These are very targeted which is great. They also tend to be more interactive than our other lectures—I think it's probably in large part due to the chalk-talk format vs. the slide decks that our lecturers use.

We also received positive feedback from the psychiatry clerkship director, who attended a presentation on the teaching scripts and received feedback from medical students who were taught with these scripts and noted that the scripts nicely complemented the formal clerkship didactics and were well-tailored toward the needs of medical students.

When we have led interactive workshops discussing barriers to teaching, the emerging themes are relatively consistent. Time, confidence, knowing what to teach, and feeling comfortable teaching are frequently mentioned, which is fairly consistent with the existing literature [1–6]. Even among highly motivated educators, these barriers persist. We have found that having a pre-scripted chalk talk helps to overcome these barriers because it provides the teacher with a compact and self-contained script, a clear plan of attack for their lesson, and the confidence that even if they forget a fact, they have an immediate reference. We received feedback that the hook-approach-content outline of the scripts was a useful frame for educators. This project adds to other teaching schemas in the psychiatric literature aimed at improving medical student education [12, 13], and we believe it improves on some of these methods by adapting adult learning principles. Our teaching scripts adopt adult learning principles with content that helps promote interactivity and clinical integration [14] and a hook that helps contextualize the learning environment [15].

In addition to benefiting educators, preliminary feedback suggests that our tool may be a valuable addition to the medical student curriculum as well. Participants and leadership cited the "in the moment" uniqueness of teaching in the resident-medical student dyad, accessibility of information delivered by near-peers (e.g., residents to medical students), and the benefits of residents communicating concise clinical pearls. Further, the common framework of each teaching script lends itself to standardization, which is increasingly important in an era in which there has been the creation of standardized competencies across residency programs [16], discussion of curricula for medical students [17], and even consideration of a standardized teaching framework [18].

We intend to expand our original curriculum of 16 topics, including through teaching script submissions from collaborators across settings and institutions, and we plan to collect more robust data to understand the impact of our curriculum on both teachers and learners. Specifically, we would like to survey residents who rotate on the inpatient units and to measure the amount of time they spent teaching medical students, comparing the time for those who use the teaching scripts versus those who did not. At the same time, we would like to gather more detailed feedback from medical students about their perception of the quality of teaching they receive and, if possible, correlate this feedback with shelf-exam scores to ascertain whether all of this translates to improved knowledge acquisition and retention. On the basis of feedback received from our workshop on

this topic at the 2018 annual meeting of the Association for Academic Psychiatry, we are also considering whether this format could be adopted by colleagues in other specialties.

This teaching tool has helped to address many of the reasons that residents offer for why it can be difficult to teach medical students by reducing time and effort burden, increasing confidence, and providing support during difficult teaching moments. We have invited other residents and colleagues to use our three-part, concise format to develop teaching scripts on topics they are passionate about and have made this project freely available on the Internet (www.teachingscripts.com). We hope this project will become a platform with multiple contributors from diverse backgrounds within our field, thus not only lowering barriers to testing the teaching waters but also expanding the range of topics to which residents have access for teaching.

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Compliance with Ethical Standards The methodology and survey instruments were reviewed by the IRB Chair of the Partners Healthcare Human Research Committee, who concurred with authors' determination that the project fell into the educational rather than research realm and thus did not require IRB review.

Disclosures On behalf of all authors, the corresponding author states that there is no conflict of interest.

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