

## Medical Education Research

### ***'Just-in-Time Teaching (JiTT) Screencasts: A Randomized Controlled Trial of Asynchronous Learning on an Inpatient Hematology-Oncology Service'***

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**Background:** JiTT screencasts are effective teaching tools in some medical educational settings, but have not yet been evaluated for trainees on an inpatient adult hematology-oncology service (HOS). Our preceding pilot data identified six high-yield topics for this setting: venous thromboembolism, oncologic emergencies, sickle cell disease, hematologic emergencies, brain metastases, and spinal metastases.

**Objective:** This study objective was to determine if the addition of educational screencasts would change attitude among learners, measured as self-reported confidence for managing the covered clinical topics on a busy HOS.

**Methods/Design:** All internal medicine residents scheduled to start a rotation on an HOS were eligible. Participants underwent block randomization to the usual educational curriculum either with screencast access (treatment) or without it (control). Allocation was concealed but participants were not blinded. Upon completion of the rotation, all participants received an anonymous online survey about their experiences. The primary outcome was the change in attitude among learners, measured as their self-reported confidence for managing the clinical topics that were covered. All randomized participants received a \$20 gift certificate upon completion of the study. Exploratory data was also collected from medical students, fellows, and faculty who opted to participate; they were given access to the screencasts without randomization.

**Results:** Over the 29 week study period (12/9/2019 - 6/30/2020), 67 out of 78 eligible residents (86%) opted to participate; these 67 residents all underwent randomization and were analyzed by intention-to-treat. Enrollment continued to completion of the study. The final participant response rate was high at 91%. Demographic characteristics were well-matched between the arms with the exception of a

higher prevalence of male gender (72% vs. 42%,  $p=0.022$ ) in the screencast arm. The majority (64%) of residents in the screencast arm rated their clinical management comfort level as either “comfortable” or “very comfortable” as compared to just 21% of residents in the usual education arm ( $p = 0.0008$ ), estimated difference = 43%, (95% CI 21%,66%) using a prespecified cumulative cutoff score. Nearly all participants on the screencast arm either agreed or strongly agreed that the screencasts improved their knowledge base in medical oncology (100%), will improve their care for cancer patients (92%), and enjoyed the format (96%). Most participants on the screencast arm felt that the intervention was optimal in terms of content (96%), length (82%), and accessibility (63%). Preferred viewing speed for the screencasts was 1.5x (52%). Nearly all participants felt that a similar database of screencasts would be helpful for all of their clinical rotations (96%). Medical knowledge as tested by a series of 6 clinical vignette multiple-choice questions was not different between the screencast and control arms (percentage correct: 77% vs. 80%,  $p=0.56$ ). Burnout as tested by the Maslach Burnout Inventory was not different between the screencast and control arms in terms of total score ( $71 \pm 12$  vs.  $69 \pm 13$ ,  $p=0.67$ ) or personal accomplishment subscale (46 vs. 45,  $p=0.71$ ). Exploratory data was also collected from 6 medical students, 8 fellows, and 6 attendings. Half of the students (50%) recommended the screencasts for the IM clerkship. Most fellows and faculty were neutral as to their interest in producing their own educational screencasts (77%) or contributing to a similar project (54%).

**Conclusions:** Resident trainees on a busy inpatient adult hematology-oncology service (HOS) found that a JiTT screencast series increased their clinical comfort level in the management of critical and commonly encountered patient problems unique to the HOS. The screencast content and delivery was overwhelmingly positive with nearly all (96%) wanting screencast series to be created for all their clinical rotations. Furthermore, as evidenced by the COVID-19 pandemic of 2020, novel distance and asynchronous learning platforms may be of increasing importance when traditional in-person methods are not feasible.