Development of a whiteboard video for managing trauma patients outside a tertiary trauma centre

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ABSTRACT

This article describes the process of developing an educational whiteboard video for community trauma management and transport. Whiteboard videos have become widely used as educational resources for various medical subject matters. These short videos package information concisely through real-time illustration with an accompanying narration. Based on a needs assessment we created a free open access educational resource for community trauma management and transport. A group of interdisciplinary trauma providers partnered in content/script development, video design and dissemination. A third-party production company oversaw video animation and voice-over. The video was disseminated widely through stakeholders and various multimedia channels. We surveyed a sample of our intended audience and the majority of respondents perceived the video to be an effective educational resource. Although cost may represent a potential barrier for producing whiteboard videos, there appears to be a role in creating educational content using this multimedia format.

RÉSUMÉ

Il sera question, dans l'article, du processus d'élaboration d'une vidéo éducative sur tableau blanc à l'intention des professionnels de la santé qui prennent en charge les soins et le transport des blessés. Les vidéos sur tableau blanc sont de plus en plus utilisées comme ressources didactiques sur différents sujets en médecine. Ces courtes vidéos communiquent de l'information de manière concise par des illustrations présentées en temps réel et accompagnées de narration. S'appuyant sur une évaluation des besoins, l'équipe a élaboré un document didactique, consultable en libre accès, à l'intention des professionnels de la santé qui prennent en charge les soins et le transport des blessés. Un groupe interdisciplinaire formé de fournisseurs de soins en traumatologie a été mis sur pied pour travailler à l'élaboration du contenu et des scénarios, à la conception de la vidéo et à la diffusion du contenu. Une entreprise de production a été engagée comme fournisseur indépendant pour superviser l'animation et la voix hors champ. La vidéo a finalement été diffusée à grande échelle par les parties intéressées, sur plusieurs plateformes multimédias. D'après un sondage mené sur un échantillon du public cible, la majorité des répondants considéraient la vidéo comme un moyen efficace d'enseignement. Bien que les coûts puissent constituer un obstacle à la production des vidéos sur tableau blanc, il semble que cette forme de présentation multimédia ait sa place dans l'élaboration de matériel didactique.

Keywords: Education, emergency medicine, trauma

BACKGROUND

Emergency and trauma care providers face many challenges when caring for injured patients in Canada. Inclement weather, long transport distances, and limited access to resources are some of the potential challenges to trauma management and transport encountered outside tertiary trauma centres. In Ontario, although non-trauma centres receive more than one-half of severely injured patients, there is a dearth of free educational resources addressing community trauma management and transport.[1]

Whiteboard videos package concise information with real-time illustration and an accompanying narration. Since the release of the first popular whiteboard video "23.5 Hours" by Dr. Mike Evans, highlighting the

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health benefits of physical activity for the general public, similar videos have been developed on other health topics.[2,3] Although research into the effectiveness of whiteboard videos is limited, initial studies show promising results. A study evaluating information retention and viewer engagement on complex physics topics found whiteboard videos outperformed other formats.[4] Further, when used in healthcare, whiteboard videos improved the process of patient consent and understanding of concepts related to specific medical interventions.[5,6] As such, we applied this medium to create a free open-access medical education resource for trauma providers.

Table 1. Eleven key concepts addressed in whiteboard video

Key concepts
Primary survey
Minimizing non-essential imaging
Use of TXA and blood products
Damage control resuscitation
Optimizing trauma brain injury management
PoCUS Application/limitations
Simplified RSI drugs
Essential interventions pre-transport
Standardized communication with trauma centres
Appropriate documentation
Geriatric considerations

PoCUS = point-of-care ultrasound; RSI = rapid sequence intubation; TXA = tranexamic acid.

PURPOSE

Based on a needs assessment of general emergency departments (EDs) and an expert advisory group through the University of Toronto Trauma program, community pediatric and adult trauma were identified as areas of perceived and unperceived learning need.[6] The primary purpose of this project was to create an educational resource using a whiteboard video to facilitate learning about community adult and pediatric trauma management and transport. Given the broad scope of the subject matter, we focused our content primarily toward physicians.

A secondary objective of our project was to evaluate trauma providers' perception of the video's effectiveness. This was done through dissemination of an online survey to the study sample using SurveyMonkey® (SurveyMonkey Inc, San Mateo, California, USA). The survey captured participant demographics and perceived video effectiveness and allowed for open-ended feedback.

Description of the innovation

We started the development of this project through the creation of a video working group, consisting of an adult trauma team leader, a pediatric trauma team leader, and an emergency medicine resident. From here, we formed a design committee including both internal and external stakeholders. Internal members within the University of Toronto Trauma program were trauma team leads from adult and pediatric tertiary care centres. The external stakeholders were a group of interprofessional trauma providers (e.g., nurses, paramedics, and physicians) from across Canada. The design committee was involved in content/script development, video design, and dissemination. Eleven key concepts were developed to be covered in the video (Table 1).

The working group merged the finalized script with preliminary storyboard concepts. We partnered with Reframe Health™, a third-party production company, to collaborate on storyboards and video animation and record the voice-over narration (Figure 1).

We aimed to share the video widely through various communication channels. The video was previewed at the annual Trauma Association of Canada Conference in 2018 and was also disseminated through stakeholders' professional email listservs and various social media platforms (e.g., Twitter, Facebook, and YouTube). Several professional associations such as Trauma Association of Canada, the Canadian Association of Emergency Physicians (CAEP) newsletter, and free open-access blogs (e.g., Emergency Medicine Cases) posted the video to their site or provided a link to view the video. As of May 15, 2020, the video had garnered over 22,000 views (video link: https://youtu.be/ZZsi_krui-8).

The study's secondary objective was to survey emergency and trauma providers regarding their perceived effectiveness of the whiteboard videos. We obtained 179 survey responses from primarily residents (24.7%) and staff physicians (63.5%) at both tertiary (70%) and community sites (41.7%). Among respondents, 83.2% felt the video improved their understanding of community trauma management (mild improvement 76/179, 42.5%; moderate 61/179, 34.1%; and significant 12/179, 6.7%), and 30% felt it offered practice-changing content. After watching the video, 91% of respondents

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Figure 1. Screenshot of whiteboard video for community trauma management and transport.

were motivated to learn more about trauma/transport care, and 86% would watch further whiteboard videos on trauma/transport care. Open-ended feedback provided by survey respondents highlighted two major themes: 1) content specific requests; and 2) more in-depth information on all topics covered in the whiteboard.

DISCUSSION

We created an open-access educational resource for trauma management through collaborative efforts with interprofessional trauma care providers. The video can be shared widely, as the content maintains a balance of general high-yield information for diverse practice environments across Canada.

There are several features contributing to the utility of whiteboard videos as an educational tool. On-demand viewing, paired with sharing across multiple social media platforms, enhances dissemination and learners' access to the material. The short and concise information, typically less than 10 minutes, specifically addresses the limits of viewers' attention span.[7,8] The animator's hand displays the image being created, acting as a cueing mechanism to focus the viewer's attention. Additionally, incorporating principles of multimedia learning simplified animations overlaid on a white background and limited text reduce distraction.[9] However, the cost of producing whiteboard videos limits their expanded use as an educational resource. Production companies will typically charge based on video length that can constrain the video's length to fit within budgetary limits.

Our sampled audience perceived the video to be an effective educational resource. To our knowledge, this is the first whiteboard video aimed at physicians to undergo evaluation. A limitation of the study is it is unknown if providers' knowledge of key concepts improved. The next steps in evaluating the video's educational impact would be assessing knowledge acquisition and retention using pre/post testing. Based on our survey's open-ended feedback, an educational opportunity may exist to build resources for those providers seeking a more nuanced approach to trauma.

SUMMARY

We created a novel whiteboard video to address community trauma management and transport. The video creation process was a collaborative effort with input from a diverse group of community and tertiary trauma care providers. Whiteboard videos are perceived to be an

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effective tool in medical education that warrant further study. A continued focus should be placed on developing educational resources to improve the delivery of high-quality trauma care in diverse environments.

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