Patient Education on Preoperative Anemia:

Promoting patient activation using character-driven animation

TXF Xiang[1], K Pavenski[2], S Wall[1,3]

1. Biomedical Communications, University of Toronto; 2. St. Michael's Hospital; 3. Department of Biology, University of Toronto Mississauga

St. Michael's
Inspired Care.
Inspiring Science.

Master of Science in
Biomedical Communications
Institute of Medical Science
UNIVERSITY OF TORONTO

ABSTRACT

- Preoperative anemia affects up to 76% of the surgical population[1].
- Preoperative anemia is a strong predictors of allogenic blood transfusions (ABT), which is associated with worse patient outcomes, including post-operative morbidity and mortality[2].
- Patient blood management (PBM) programs have been shown to effectively reduce ABT and improve patient outcomes[1].
- Yet, PBM implementation still encounters many barriers. Among others is the lack of patient activation, due to insufficient patient education.
- We developed an educational animation with two goals in mind:

1) ***Educate*** all preoperative patients on their risk of anemia;

2) ***Improve awareness*** of the Patient Blood Management (PBM) program, thereby ***increasing patient activation*** and enhancing preoperative care outcomes.

BACKGROUND

Character-driven Storytelling Promotes Patient Activation

- Patient Activation means to empower patients with the knowledge, skills, and confidence to manage their own condition[3].
- The narrative progression of a character-driven story depends on a character's behaviour or their interaction with a narrative element (e.g., "What does she do when diagnosed?").
- Character-driven stories offer several advantages:

1) More effective at signposting access to health resources among different cultural groups[4].

2) Decreasing patient anxiety[4] while increasing the trust between patients and their caregiver[5].

PBM Patient Education Status Quo

- Character-driven stories are largely neglected in patient-ed resources.
- Existing video productions on topics of PBM are lead by clinicians for clinicians, with the aim of covering the basics of transfusion medicine, instead of educating patients.
- Delivery of healthcare messages and engagement rely heavily on text-animations (Fig. 1a) and other motion graphics trends (i.e., whiteboard animation, Fig. 1b), which could exclude non-English speaking patients.

Fig 1: Screen shots of existing PBM videos. a) Text animation from *Choosing Wisely: Canada Transfusion Recommendations* b) *Trauma Transport Checklist,* a whiteboard animation.

MATERIALS & METHODS

- 3D assets were modeled and animated in Autodesk Maya 2019. 2D characters were created in Adobe Illustrator. All 2D and 3D assets were composited in Adobe After Effects CC.
- The animation features three character categories:

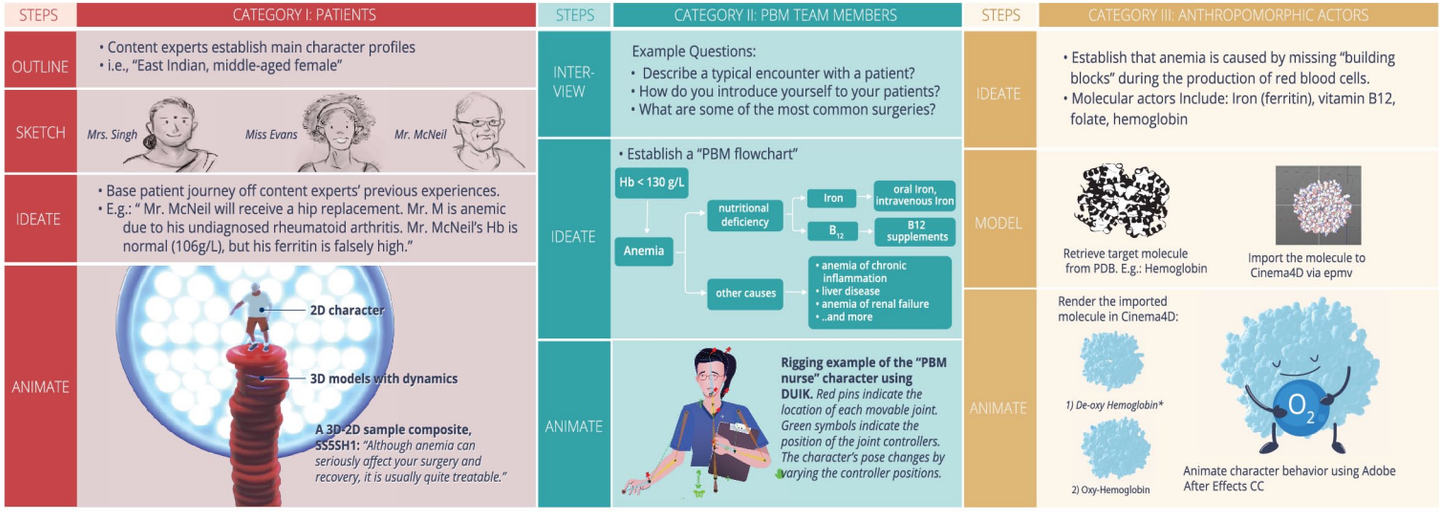

Chart 1. Steps to Character Development Based on Character Categories. *: Conformation change animations are restricted to proteins only. Data for conformation changes are retrieved from PDB

RESULT

- The animation follows a typical pre-operative patient's journey from pre-op prep, to diagnosis, and finally to the treatment of anemia.

		SCENE	THEME	COMMUNICATION TARGETS	CHARACTER
3M 37S TOTAL	17s	1	Introduction	• Pre-opertive care • Patient demographics	
	30s	2	What is anemia	• Causes of anemia	
	30s	3	Diagnosing anemia	• Measuring Hemoglobin • Symptoms of anemia	
	40s	4	Potential outcomes of preoperative anemia	• Transfusion risks • The need of prioritizing treatment	
	75s	5	Treating anemia with the PBM team	• Treatment timing • Meeting your PBM team • Personalized treatment	
	25s	6	PBM Summary	• Avoiding unnecessary tests, transfusions, and bleeding during surgery	

DISCUSSION

- Upon completion, this project will be the first character-driven educational animation addressing PBM.
- We plan to conduct a summative evaluation on the animation once production is complete. The evaluation will focus on the following areas:

1) Quantitative measurement on the patients' knowledge improvement on pre-operative anemia.

2) Likert scale feedback on patient activation. E.g., "I want to speak to my physician about my anemia status after watching this animation. 1: Strongly disagree. 5: Strongly agree."

REFERENCES

1. Meybohm, P., D. Fischer, A. Schnitzbauer, A. Zierer, T. Schmitz-Rixen, G. Bartsch, C. Geisen, and K. Zacharowski. "Patient blood management: Current state of the literature." Der Chirurg: Zeitschrift Fur Alle Gebiete Der Operativen Medizen 87, no. 1 (January 2016): 40–46. https://doi.org/10.1007/s00104-015-3011-3.
2. Shander, Aryeh, and Lawrence Tim Goodnough. "Can Blood Transfusion Be Not Only Ineffective, But Also Injurious?" The An- nals of Thoracic Surgery 97, no. 1 (January 1, 2014): 11–14. https://doi.org/10.1016/j.athoracsur.2013.08.007
3. Hibbard, Judith H, Jean Stockard, Eldon R Mahoney, and Martin Tusler. "Development of the Patient Activation Measure (PAM): Conceptualizing and Measuring Activation in Patients and Consumers." Health Services Research 39, no. 4 Pt 1 (August 2004): 1005–26. https://doi.org/10.1111/j.1475-6773.2004.00269.x.
4. Haigh, Carol, and Pip Hardy. "Tell Me a Story — a Conceptual Exploration of Storytelling in Healthcare Education." Nurse Educa- tion Today 31, no. 4 (May 2011): 408–11. https://doi.org/10.1016/j.nedt.2010.08.001.
5. McWilliam, C.L., Stewart, M., Brown, J.B., McNair, S., Desai, K., Patterson, M.L., Del Maestro, N., Pittman, B.J., 1997. Creating empowering meaning: an interactive process of promoting health with chronically ill older Canadians. Health Promotion In- ternational vol. 12 (No. 2), 111–124.