

Connect-ICU: A SWOT analysis of healthcare communication technologies and their implementation using semi-structured interviews



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INTRODUCTION

Because of the nature and complexity of care in the ICU, communication can be challenging between patients, their loved ones, and the healthcare team. We aim to better understand communication technologies and their applications in healthcare as part of a larger project that hopes to leverage communication technologies to facilitate patient and family-centered care (PFCC), encourage meaningful communication, and develop therapeutic relationships in the ICU.

Objectives of this study were to:

- identify communication technologies that have been approved, implemented and/or used in healthcare systems
- engage participants in a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of healthcare communication technologies and their implementation
- Collect information regarding cybersecurity requirements.

METHODS

We conducted a SWOT analysis using a generic qualitative approach and semi-structured interviews.

We included a purposive and pragmatic sample of four experts in communication technology, including members of the Digital Health Team at the Saskatchewan Health Authority (SHA) and eHealth Saskatchewan.

Individual or small-group interviews were conducted over WebEx with a research assistant. This study has been approved by the Behavioural Research Ethics Board at the University of Saskatchewan, and verbal informed consent was obtained from participants.

ACKNOWLEDGEMENTS

We gratefully acknowledge the support of the Saskatchewan Health Research Foundation, the Saskatchewan Health Authority, and Dr. Vern Behl, Senior Medical Information Officer.

RESULTS

Communication Technology	Strengths	Weaknesses	Opportunities	Threats
Telephone	<ul style="list-style-type: none"> • User friendly • Accessible 	<ul style="list-style-type: none"> • Cannot do clinical exam 		
Vocera Badge (wearable devices for voice communication)	<ul style="list-style-type: none"> • Synchronous 	<ul style="list-style-type: none"> • Not integrated with electronic medical records (EMR) or other sites 		
Telehealth (secure videoconferencing system)	<ul style="list-style-type: none"> • Exists across & outside of Saskatchewan • Well-established practice • Allows participation from multiple providers, patient, and family members 	<ul style="list-style-type: none"> • Not integrated with EMRs • Needs a facility with physical equipment 	<ul style="list-style-type: none"> • Direct and facilitated visits (e.g. facilities can support patients with technology, and physicians with clinical data) 	
Pexip (secure web-based videoconferencing program)	<ul style="list-style-type: none"> • Private and secure • An approved clinical communication tool • Accessible, with a phone option, and can be integrated with Telehealth endpoints 	<ul style="list-style-type: none"> • No secure messaging or waiting room • Not integrated with EMRs • Cannot do clinical exam 	<ul style="list-style-type: none"> • Allows video communication between providers and patients, or between providers only • Successfully used in primary care during the pandemic • Can include patient and families in rounds 	<ul style="list-style-type: none"> • Accessibility to a webcam • Miscommunication due to connection issues • Accessibility to a private space
Facetime, Duo, Skype		<ul style="list-style-type: none"> • Cannot do clinical exam 		<ul style="list-style-type: none"> • Accessibility to a webcam • Providers' access to devices on the wards
Webex, Webex Teams	<ul style="list-style-type: none"> • Accessibility via computer, tablet, phone, browser or app 	<ul style="list-style-type: none"> • Cannot do clinical exam 	<ul style="list-style-type: none"> • Useful for administration 	<ul style="list-style-type: none"> • Providers' access to devices on the wards
Microsoft Teams		<ul style="list-style-type: none"> • Cannot do clinical exam 	<ul style="list-style-type: none"> • Useful for provider to provider communication • Can include patient families in rounds 	<ul style="list-style-type: none"> • Providers' access to devices on the wards • Provincial network infrastructure not yet established
Texting	<ul style="list-style-type: none"> • User friendly • Convenient • Accessible 	<ul style="list-style-type: none"> • Not formally approved (not private or secure) 		

Table 1. Results of a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of communication technologies and their implementation. Communication by telephone and videoconferencing platforms had strengths in user-friendliness and relative accessibility, but have limitations in security, and integration with clinical information. Telehealth and Pexip had strengths and opportunities in security, privacy, and communication with multiple parties, but have limitations in integration with clinical data and accessibility of necessary equipment.

RESULTS

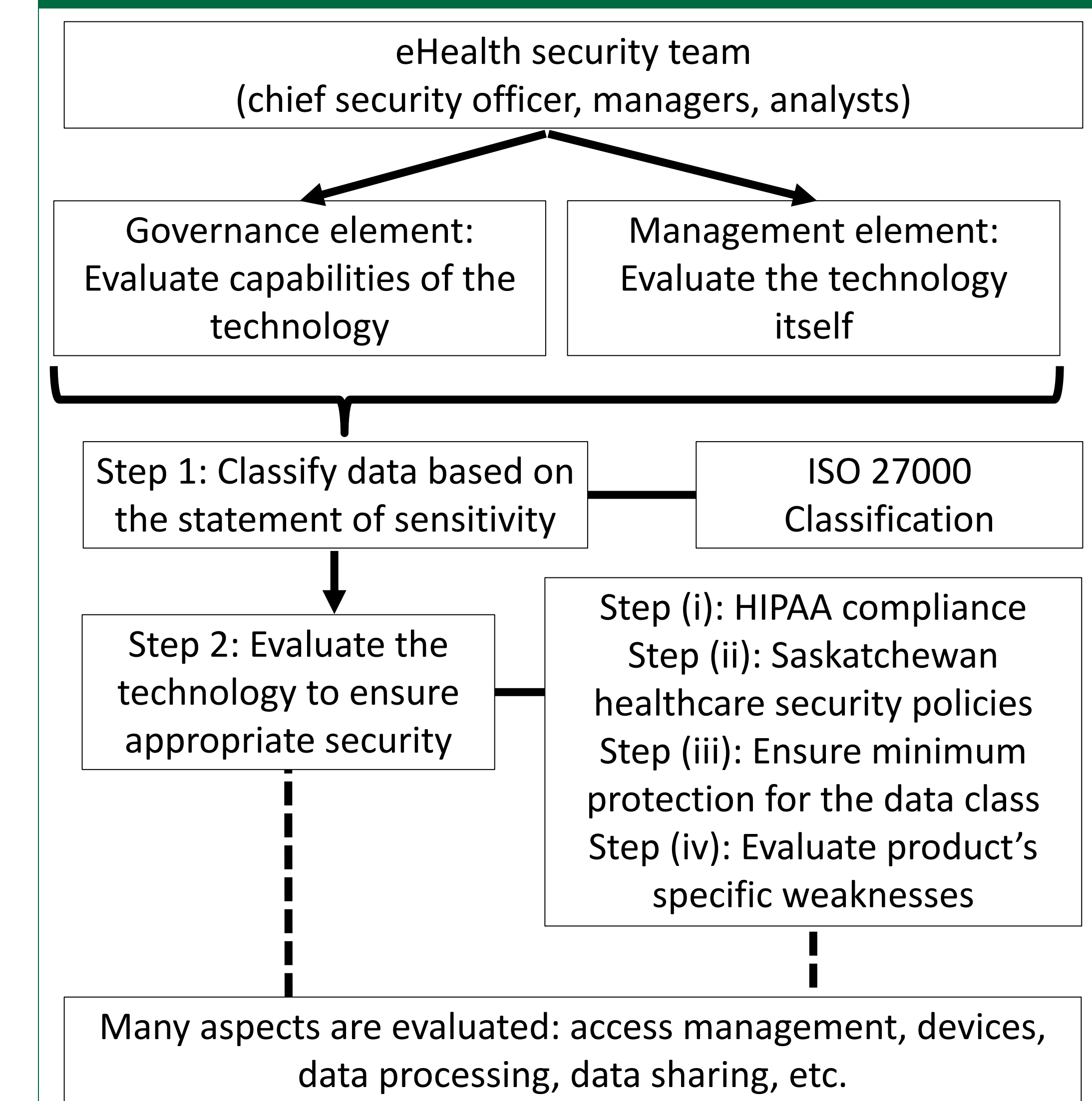


Figure 1. An overview of the multistep process used by the eHealth security team to evaluate new communication technologies. Technologies are evaluated to ensure appropriate security according to legislation, provincial policies, and industry standards for its data classification.

DISCUSSION

- Existing solutions to virtual care attempt to address issues related to accessibility and inclusion of multiple parties while maintaining security and privacy.
- Our analysis of existing technologies demonstrates a need for solutions that allow for integration of communication modalities, integration with medical records, and accommodation of patients' accessibility to devices and networks.
- Uptake of new solutions will require adaptation to existing workflows, and awareness and engagement from providers & patients.
- Proposed technologies are evaluated by a security team through a complex process to address weaknesses, and to ensure cybersecurity requirements and regulations are fulfilled.