Qualitative Assessment of a Non-Invasive Vital Sign Monitor with Secure Home-Based Video Conferencing Patient Engagement Platform: The e-Clinic Pilot Study

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INTRODUCTION/BACKGROUND

- The percentage of people with high blood pressure in New Brunswick was 23.0% compared to the national rate of 17.7% in 2013. In 2011, the proportion of the New Brunswick population in urban and rural areas was 52% and 48%, respectively.
- There is a need for new technology that can monitor blood pressure population-wide and within a single family practice, and eliminate the challenge of geographical distance between a patient and their physician.
- The aim of this study is to facilitate patient self-management with emphasis on senior care management by implementing a clinically validated vital sign monitoring device which will improve health care, regardless of geographic distance and challenging mobility issues to accessing health care.
- Home blood pressure monitoring (and telemonitoring) improves patient health care and is a strong predictor for stroke and cardiovascular disease.
- The Cloud DX Pulsewave Health Monitor™ is a blood pressure wrist cuff oscillometric device that connects to a PC computer with a USB cable and sends the readings to a secure personal account online in the Cloud.
- Medeo™ provides a virtual care platform and it is the only direct to patient virtual care solution of its kind in Canada. It is designed to complement existing technologies and to offer secure, confidential, video and messaging-based virtual care tools.

METHODS

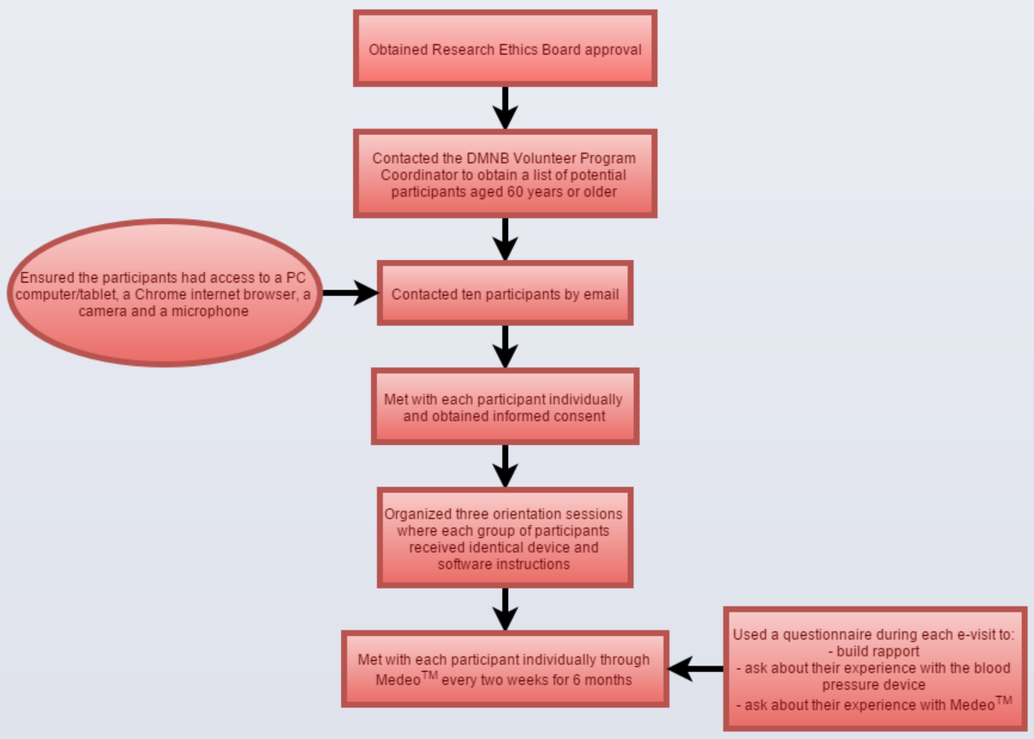

Figure 1: Study Design Flow Chart

RESULTS

Table 1: Participant Characteristics (n=10)

Gender (M/F)	5/5
Age (Mean ± SD)	67 ± 6 yrs.
Use of Desktop Computer or Laptop (Y/N)	60% (6/4)
Use of Tablet (Y/N)	40% (4/6)
Pre-existing home blood pressure device (Y/N)	80% (8/2)

Table 2: Tasks asked of participants by student physician

Task	Successful/Unsuccessful/Not attempted
Send a photo of your right hand through Medeo™	6/3/1
Send a Cloud DX™ blood pressure report through Medeo™	3/2/5
Take a blood pressure reading during a Medeo™ meeting	10/0/0
Join the Cloud DX Physician-Portal™	10/0/0

Medeo™

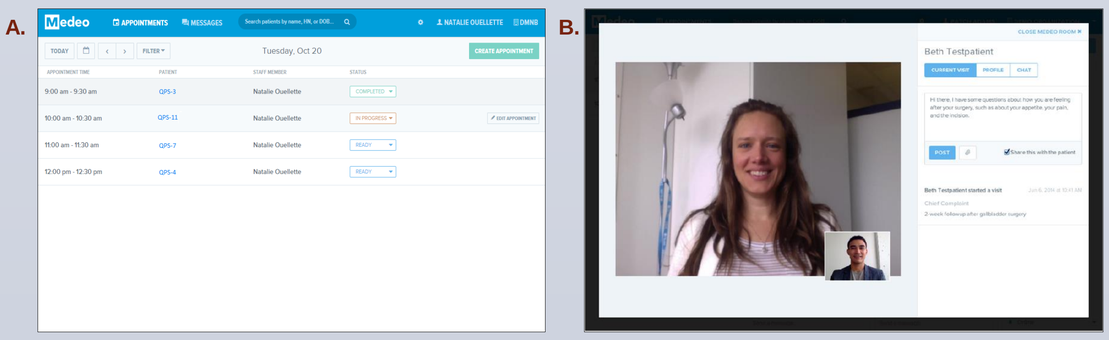

Figure 2: **A.** Physician Dashboard **B.** Medeo™ Secure Private Video Consultations displaying the patient-physician virtual encounter

Cloud DX Pulsewave Health Monitor™

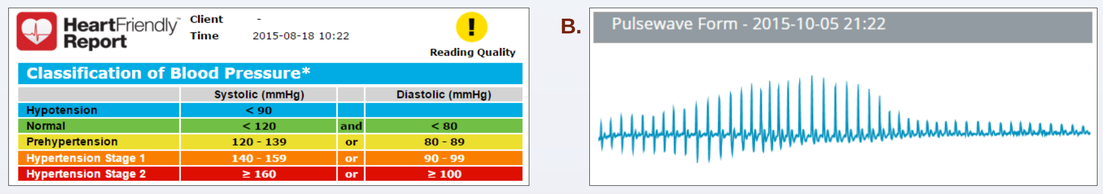

Figure 3: The various graphic representations Cloud DX™ offers for the patient and the physician to visualize trends in blood pressure and monitor the patient's progress. **A.** Blood pressure report generated after each reading **B.** Digital Pulsewave form **C.** Graph displaying the 28 day trend and average with corresponding classification colour scheme **D.** Patient dashboard displaying the most recent Blood Pressure reading, Total Anomaly Score, Average Pulse Rate and Average Breathing Rate with corresponding classification colour scheme **E.** Digital oscillometric Pulsewave Health Monitor™ wrist cuff device

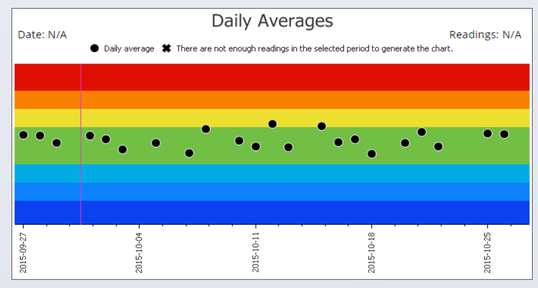

Figure 4: Cloud DX Physician-Portal™ Daily Averages graph. These graphs allow patients and physicians to easily monitor the blood pressure readings. The Cloud DX Physician-Portal™ is a valuable feature to prioritize cases for follow-up.

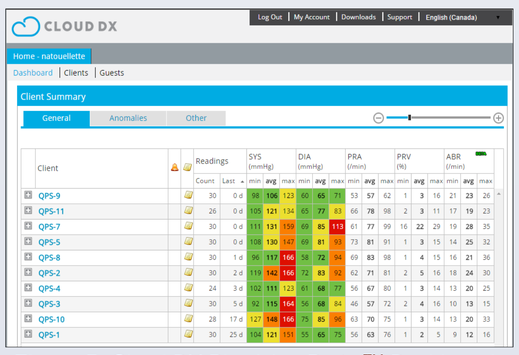

Figure 5: Cloud DX Physician-Portal™ Dashboard displaying the client list with various blood pressure parameters.

Table 3: Challenges and positive feedback encountered throughout the study

Challenges	Positive Feedback
Incompatibility of technology	Easy to use
Internet access	Convenient
Installation and registration of device and video conferencing software	Ability to self-monitor blood pressure
Video and audio quality	Ability to connect to physician from home
Username and password issues	Excellent technical support at no cost

CONCLUSIONS

- Telemonitoring is a paradigm shift in health care delivery that remains to be developed fully.
- Community-based support for seniors' internet access may be required; however, the Pulsewave™ device and the Medeo™ software are implementable technologies.
- All participants readily connected with the student physician despite citing concern over a lack of computer experience.
- There are potential local, national and international applications of virtual patient-physician encounters that require further research.
- Further analysis and additional studies to assess the feasibility, health economics and quantitative outcomes involving patients and physicians are required.

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