Mobile Information Network for the Elderly: Decision Support for Paramedics using Biometrics (MINE)

Elderly populations disproportionately use paramedic services often as a result of co-morbidities requiring immediate medical attention when compared to all other age groups. While research has illustrated the importance of health information early in an emergency, elderly patients may not be able to communicate all health information accurately. Consequently, paramedics are often administering care to patients “blindly” and therefore unaware of the patients' current conditions, medications, allergies, or any other special requirements for treatment. Providing paramedics with this basic information may help avert dangerous medication interactions, increase speed of informed decision making and enhance the quality of care. The Mobile Information Network for the Elderly (MINE) Project aims to equip paramedics with this basic, yet critical information in order to enhance the quality of care for elderly patients and potentially improve patient outcomes.

MINE focuses on the critical role paramedics play in the early treatment of a patient by enabling paramedics’ access to a synopsis of the most relevant health information at the point of care. The relative simplicity of the project is centered on the principle of getting the right information to the right person at the right time. MINE combines previously developed proven technology (biometrics, mobile devices and an electronic database) to input, retrieve and use information for the improvement of pre-hospital care.

MINE Plan

Through kiosks (S1.2) located in primary care providers’ offices, elderly patients can volunteer their basic health information to be used in the event of an emergency. Participants will be asked to scan their palm veins and enter basic information (S1.3 & S2.0). This information will be held in a secure cloud database which can only be accessed through mobile devices at the point of care by paramedics when both the paramedic and patient have been authenticated using their portable vascular biometric device. The access to this information in a timely manner will provide paramedics with the knowledge necessary to make the most informed decision for the best emergency management option. Patients remain in control of their health information at all times as only they can update or remove their information from the MINE database.

MINE Evaluation

The MINE Project will be evaluated using before and after implementation data. During Phase 2, initial baseline data will be collected in the pilot region and will look at three main areas: number and severity of adverse events resulting from paramedic services, information gathering efficiency and ease of patient transfer to health care providers at the hospital. Six months after the program has been implemented a follow-up study will be conducted. We believe that these measureable areas will provide a good indication for the effects of MINE on patient outcome and quality of care improvements.

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**MINE TIMELINE**

Through a pilot project, MINE can be operational within 3 years and will be executed in 4 general phases (S1.1):

- **PHASE 1 (14 months):** Resource planning, user consultation and software development.
- **PHASE 2 (10 months):** Education and promotion of MINE, and primary care provider agreement. Baseline data for evaluation is gathered.
- **PHASE 3 (2 months):** MINE goes ‘live’, continuous improvements and system upgrades.
- **PHASE 4 (10 months):** MINE evaluation and plans for pilot project expansion.

**MINE CHALLENGES**

Four concerns must be addressed in order to successfully integrate and sustain the MINE Project: financial resources, usability, privacy and acceptance. First, the **financial costs** of planning, developing, piloting and sustaining MINE are quite large even though the technology itself already exists and is not overly expensive. The major costs will be incurred through software development, hardware, information input and database maintenance, as well as education and promotion of the project.

Secondly, **usability** will be achieved by developing software that is capable of meeting the needs of our target population, the elderly. Furthermore, the software must allow paramedics to quickly navigate the system during emergency situations.

Third, the most significant risk in the MINE project is **privacy** of information. Steps will be taken to ensure the most up to date security measures, such as data encryption and access to information, as well as the legalities to privacy and security policies mandated by Canadian and Ontario governments, are adhered to.

Finally, **acceptance**, we understand that elderly populations are not as technologically-literate as other age groups and are therefore less trusting of technology. However, we also believe that this age group does understand that technology can assist in enhancing the quality of care. Kiosks located in primary care providers’ offices will enhance the security and trust necessary to ensure that the volunteering of health information is done safely. This also means that primary care providers will have to be champions for the project. Through a strong education campaign, we think that any doubt in primary care providers’ acceptance of the project can be quelled.

**MINE CONCLUSION**

Innovation in healthcare is driven by the need to improve quality of care, the ever growing extension of technology into healthcare, the drive towards meaningful use and the continual emphasis on improvement of patient-centered care. The MINE Project provides a means to address various aspects of these needs in the elderly population. Currently, paramedics do not have access to key information regarding medications and health conditions for patients in emergency situations. MINE is innovative because it allows paramedics timely access to health information that is volunteered and controlled by the patients themselves. Accessibility to health information for elderly patients through MINE, will allow paramedics to respond faster and perform the best possible quality of care as a result of integration of portable electronic technology into the care process and effective use of health information.