Research Article

Tele-Emergency: JIPMER Experience

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Abstract

Telemedicine has various utilities through telepresence technology. For the resident undertaking medical training, it is imperative to guide him during the course of his training period; this may not be likely practically. Through telepresence technology a teacher presence can be felt anytime. In emergency cases, it may not be feasible for the consultant to be available but through telepresence technology, it seems likely. Even in situation where consultant is not available in the vicinity, he/she can guide the resident through this technology. With consultant, other residents who are interested in the procedure can also participate and learn simultaneously. We share our experience of telemedicine in the management of emergency cases.

Keywords: Tele- emergency; Tele- consultation; Tele-medicine

Introduction

It has been more than 25 years from the time when Grundy et al. first described the use of intermittent remote telemedicine consultation to improve the delivery of health services [1-3]. Telemedicine can be defined as "The practice of medicine at a distance"; it typically involves prompt access to remote medical expertise by means of telecommunication and information technologies. Previously it was thought that telemedicine technologies are complex, expensive, and their adoption is often reliant on fundamental clinical practice change. Due to development of cheap and technologically sound gadgets (smartphones), we can overcome these hurdles.

Methods

The study was an observational study conducted in emergency department and in Department of Plastic Surgery, Jipmer, and Pondicherry from August 2015 to February 2016. The tele-emergency system consisted of an audiovisual monitoring aid comprising IP camera (Macroplus Robot Ball HR101-W wireless camera) with a resolution of 720 p with live HD streaming. The camera is synchronized to the mobile phone of the duty consultant and resident and also through an application installed on a tablet that provides video chat and voice call services using the IP address (Figure 1-4). The device also has inbuilt audio and video recording in addition to online transmission facility. In the 7 months of study period about 152 cases were consulted with the consultant, who was in operation theatre or in a situation in which he could not reach the casualty immediately.

At the end of the treatment, satisfactory levels of the patients, time taken for the initiation of treatment, clinical diagnostic accuracy were documented. Treating consultant's feedback was also obtained.

Results

The consultants, residents and patients found the tele-emergency consulting system to be:

- User friendly
- Time saving
- Cost effective
- Providing clinical diagnostic accuracy almost equivalent to bedside clinical examination
- Frequent interaction and updates with consultants and experts

Discussion

Alexander Graham Bell made the earliest telephone transmission to his assistant Mr. Watson. It was: "Watson, come here, I need to see you." He was asking for Watson's help, as he had spilled acid on his leg. The call for medical help remotely marks the first event in modern telemedicine [4-6].

Types of TM

1. Store and Forward (SAF) (asynchronous) TM

2. Real-time or Video Conference (VC) (synchronous) TM

3. Hybrid telemedicine

4. Mobile or cellular telemedicine

Figure 1: Tele-Emergency console in emergency department.

Figure 2: Smart phone being utilized to obtain clinical photographs.

Figure 3: Applications used for real-time telemedicine purpose.

5. Integration model [6]

Asynchronous TM

In this, for expert interpretation, data about the wound is acquired and stored in some format before being sent by some appropriate means. It comprises of transmission of digital images, and asynchronous evaluation is practiced. The simultaneous existence of the health care professional is not required. It is the commonly used technology. SAF TM has been found to be cheap and user friendly.

Synchronous TM

There is no considerable delay between the information being collected, transmitted and displayed regarding the wound. Interactive communication about wound care amongst individuals at the site is, therefore, possible. Real-time interaction involves an expert to be available to give an opinion. Real-time or video consultation utilizes videoconferencing equipment to connect the patient with a distant consultant often with the aid of their General Practitioner or nurse.

Hybrid TM

The combination of SAF TM in the initial step followed by VC TM in the second step is entitled hybrid TM. Use of this method has found to be quick, clarifies doubts and evades misinterpretation between the communicators. The best physician and patient satisfaction as far as wound care concerned is achieved through this method.

Cellular TM

To convey wound care or lesion images at a distance devices like cellular phones, laptops and handheld computers with an inbuilt camera to capture wound's digital images, and computing and networking features are utilized in this method. Direct interaction and image access is obtained. Speed of image transmission and quality is no longer an obstacle.

Integration model

This method utilizes a combination of one or more of the above methods.

Conclusion

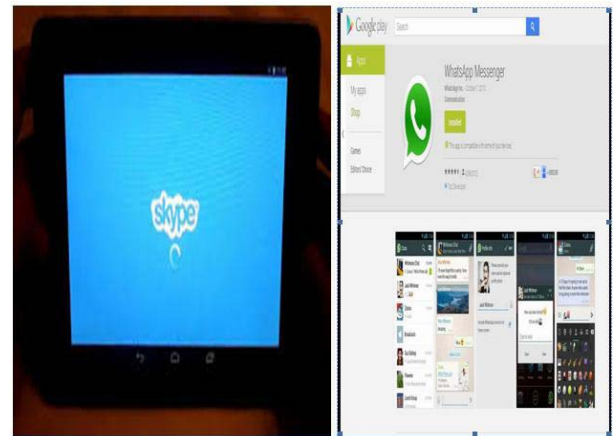Based on our experience tele- emergency seems to be a promising

Figure 4: Consultant giving tele- emergency consultation.

path, especially, where there are a limited number of board-certified specialty care givers. It is user friendly, cost effective helps in early initiation of treatment, and frequent interaction and updates with consultants and experts.

References

1. Goran S. A second set of eyes: an introduction to tele-ICU. Crit Care Nurse. 2010; 30: 46-54.

2. Goran SF, Van der Kloot T. Savings in RN staffing costs pre and post eICU implementation. In: eICU Program Success Stories. Baltimore. MD: Philips-VISICU. 2008.

3. Grundy BL, Jones PK, Lovitt A. Telemedicine in critical care: problems in design, implementation, and assessment. Crit Care Med. 1982; 10: 471-475.

4. Gracias V. Canada: IATSIC-AAST Conference. Montr al QC. Outcomes of SICU Patients after Implementation of an Electronic ICU ("eICU") System and Off-Site Intensivist. 2007.

5. Perednia DA, Allen A. Telemedicine technology and clinical applications. JAMA. 1995; 273: 483-488.

6. Chittoria RK, Singh U, Muralidhar A. Telemedicine for Doctors. 1st ed. New Delhi (India): AITBS Publishers. 2009.