



TELEMEDICINE: IMPROVE BYSTANDER CPR RATE

Bystander CPR, performed by individuals present at the scene, is crucial in maintaining blood circulation and oxygen supply until professional help arrives. Find out how telemedicine improves the bystander Cardiopulmonary Resuscitation (CPR) rate before ambulance arrival. By Dr Sattha Riyapan, Director of Siriraj Emergency Services; Department of Emergency Medicine; Value Driven Care Center, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand.

Telemedicine has witnessed remarkable advancements in recent years, thanks to the rapid progress in technologies such as 5G and Wi-Fi 6, which have significantly improved speed and reduced latency.

These advancements have revolutionised various aspects of healthcare, including emergency care. This article highlights how Siriraj Hospital in Thailand have applied telemedicine in emergency care –

using telemedicine to improve the bystander Cardiopulmonary Resuscitation (CPR) rate before ambulance arrival.

This innovative approach aims to empower individuals to deliver life-saving interventions in critical situations, thereby significantly enhancing the chances of survival for cardiac arrest victims.



Some members of the Siriraj Emergency Medical Service team with their partner True Digital.



Background

Cardiac arrest is a life-threatening condition that requires immediate medical attention. Bystander CPR, performed by individuals present at the scene, is crucial in maintaining blood circulation and oxygen supply until professional help arrives. The procedure plays a vital role in improving survival rates for the victims.

Unfortunately, a significant number of bystanders are unable to perform CPR at the scene, resulting in preventable deaths. The key problem statement lies in the limited accessibility to timely CPR guidance and inadequate knowledge among the general public, leading to hesitation and fear of performing CPR.

Although many countries, including Thailand, have implemented dispatcher-assisted CPR protocols that provide instructions over the phone from emergency dispatchers, the bystander CPR rate remains low. This might be due to dispatchers being unable to empathise with the bystanders and not directly assisting them in overcoming their fears or obstacles. However, telemedicine shows great potential in overcoming this problem by providing real-time video communication to support the dispatchers.

Evaluation Considerations

Recognising the urgent need for a solution, a team of dedicated healthcare professionals from Siriraj Emergency Medical Services at Siriraj Hospital, Thailand, and technology experts from True Digital embarked on a mission to develop a telemedicine-assisted CPR system. The goal was to create a user-friendly telemedicine system accessible through any smartphone without requiring the download of additional applications before emergencies.

The CHI Fellowship in Healthcare Innovation & Leadership inspired the project, and provided guidance in the creation of a new process. When a cardiac arrest call is received, the emergency center sends a URL link via telephone message, which connects the caller to a web-based application featuring real-time video communication.

This allows the emergency dispatcher to visualise the patient and the scene, enabling them to provide telemedicine-assisted CPR instructions. These instructions include guidance for the bystander through the CPR steps, immediate feedback, and support. Simultaneously, the ambulance team receives the GPS location and gains access to the telemedicine system to view the patient and the scene before their arrival. This empowers them to prepare a resuscitation plan in advance.



Challenges and Solutions

The development of a telemedicine-assisted CPR solution posed various challenges, which the team successfully addressed through their dedicated efforts.

1. **Connectivity and Technical Challenges:**

Ensuring seamless and reliable connectivity, especially during emergencies, was a significant hurdle. The team tackled this issue by optimising the system to adapt to different network conditions and conducting extensive testing across various devices and networks. Despite these efforts, occasional technical problems may arise. In such cases, the team has maintained the backup protocol of dispatcher-assisted CPR instructions over the phone.

2. User-Friendly Interface: Creating a user-friendly interface that can be easily accessed in high-stress situations was crucial. The team invested significant effort into designing an intuitive web-based application that provides clear instructions and visual cues to assist bystanders in performing CPR effectively. By focusing on simplicity, clarity, and ease of use, they aimed to alleviate any potential confusion or anxiety experienced by users during critical moments.

3. **Acceptance, Trust, and Data Security:**

Gaining acceptance and trust in the telemedicine-assisted CPR system required addressing privacy, data security, and liability concerns. The team collaborated with legal experts to develop robust privacy policies, encryption protocols, and consent procedures.

By ensuring the protection of user data and compliance with relevant regulations, such as the PDPA law in Thailand, they aimed to instill confidence among users regarding the system's privacy and security measures. Utilizing the True VROOM chat room engine, which adheres to data privacy policies, further enhanced the system's credibility.

4. **Training and Communication:**

Despite the implementation of the telemedicine system, ongoing training, and guidance are necessary to ensure that healthcare providers are skilled in utilising the telemedicine-assisted CPR protocol effectively.

Further research should investigate proper communication strategies within the telemedicine system during cardiac arrest scenarios, ensuring effective information exchange and seamless coordination between dispatchers, bystanders, and medical professionals.

The team aims to overcome barriers and optimise the telemedicine-assisted CPR system's performance by addressing these challenges and continually refining the solution. Their efforts paved the way for improved emergency response and increased survival rates for cardiac arrest victims.



Future Plans

Having completed the prototype, the project will now focus on conducting pilot studies to explore the feasibility and effectiveness of the telemedicine-assisted CPR system in improving the bystander CPR rate and patient outcomes. This will provide valuable insights and data to refine further and optimize the solution.

Moving forward, the project aims to expand its reach by establishing partnerships with emergency response services, healthcare organizations, and community groups. Collaborating with these entities will enable the team to integrate the telemedicine platform into existing emergency response systems and workflows, ensuring seamless implementation and widespread adoption.

The team plans to continuously gather user feedback and insights to improve the telemedicine platform's usability and effectiveness. They will prioritize incorporating advanced features into the system, such as an automated external defibrillator (AED) locator. This enhancement will further enhance the capabilities of bystanders in delivering timely and appropriate interventions.

The team intends to conduct rigorous clinical trials to validate the effectiveness and impact of the telemedicine-assisted CPR system on a larger scale. These trials will provide scientific evidence supporting the solution's benefits, helping to drive its acceptance and integration into standard emergency care protocols.

In conclusion, we are using telemedicine to improve the bystander CPR rate before ambulance arrival holds immense potential for saving lives. This innovative approach addresses the critical gaps in timely cardiac arrest response by leveraging technology, empowering individuals, and providing real-time guidance.

Through ongoing development, partnerships, and scientific validation, this solution has the potential to make a profound impact on public health and emergency medical care, ultimately enhancing survival rates and improving outcomes for cardiac arrest victims.



© Centre for Healthcare Innovation
Permission required for reproduction.
Email: chi@ttsh.com.sg