

Spreading innovation in healthcare

High-speed CAREN network enables remote medical consultations and training for better patient care across Central Asia

For many people across the world, geographic remoteness and lack of specialised resources prevent access to essential healthcare. Extending and improving patient care is therefore a major goal and technology has a strong role to play through telemedicine. High-speed research and education internet networks such as CAREN in Central Asia can link doctors and patients irrespective of location, providing teleconsultations and remote training – potentially improving the lives of millions.

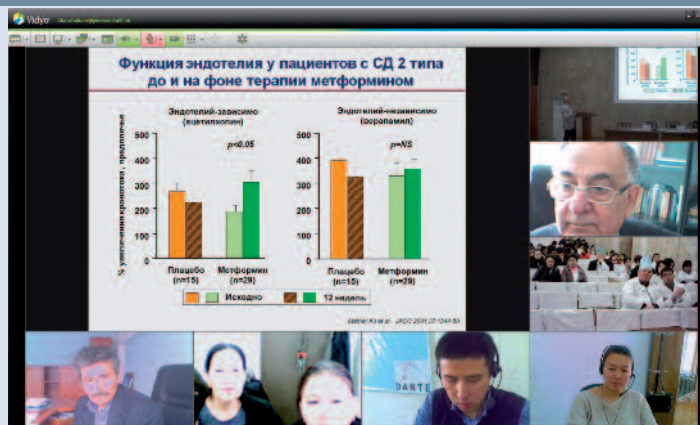
Revolutionising medical training

Effective medical and, in particular, surgical training takes place in situ, allowing students to 'watch, learn and participate' in operations. However, access and hygiene issues mean this is not always possible. Imagine therefore a scenario where doctors from different hospitals can collaborate on a surgery without having to actually be in the operating room. What if doctors in remote locations could receive immediate expert support from top specialists around the globe? Thanks to advanced and pervasive Internet networks that allow the transmission of high-quality video to multiple locations for interactive medical training telemedicine is now well established in many parts of the world.

Catalysing telemedicine in Central Asia

In 2013, Dr Kanat Batyrbekov, endoscopist at the Research Institute of Traumatology and Orthopedics in Astana, Kazakhstan, spent time at Kyushu University Hospital, Japan – a pioneering force in telemedicine. He soon saw the potential to revolutionise healthcare within his own region: *"I was very privileged to be invited by Professor Shuji Shimizu at his institute and to see him and his team in action conducting telesurgical training sessions over high-speed Internet networks. The picture quality is just amazing! This inspired me and my colleagues to explore with the CAREN project office similar opportunities across Central Asia."*

The CAREN NREN¹ community is now taking the lead to develop telemedicine in the region. In 2013, doctors from four Central



The challenge: as medical skills become more specialist, there is a need to ensure the transfer of knowledge and training to physicians across Central Asia

The solution: CAREN supports the streaming of high quality, real time video to multiple locations enabling interactive and virtual medical training and consultations

Key benefits: by linking doctors and hospitals across geographical boundaries, CAREN provides Central Asia access to world-class medical education which will improve patient care, reduce costs and save lives

Asian partner countries took part in the first collaborative medical session, during the 36th Asia-Pacific Advanced Network (APAN) Meeting in Daejeon, Korea, via the CAREN network.

Towards a regional telemedicine network

In March 2014, cardiologists from Kazakhstan, Tajikistan and Turkmenistan attended a regional conference alongside colleagues at the National Center of Cardiology and Internal Medicine in Bishkek.

¹ National Research and Education Networks: KRENA in Kyrgyzstan, KAZRENA in Kazakhstan, TARENA in Tajikistan and TURENA in Turkmenistan





Cardiologists participating remotely in a regional conference in Bishkek from their home institutions/NREN offices thanks to dedicated national and regional R&E networks

Thanks to high-quality video links supported by the CAREN network, this was the first time they were able to discuss latest medical advances from their home institutions, without having to travel long distances – saving valuable clinical time. Physicians at the Yssyk-Kul regional hospital, located 400 km east of the Kyrgyz capital were also able to participate remotely. CAREN has helped make the dream of Professor M.M. Mirrahimov, famous cardiologist after whom the centre in Bishkek and the conference are named, come true: telemedicine is now a reality in Central Asia.

Previously there had not been sufficient bandwidth within Central Asia to allow such a specialist conference to be conducted via the Internet. Thanks to the upgrade of the CAREN network, bandwidth capacities have increased ten-fold since 2010, despite continuing challenges within Central Asian telecommunications markets.

Extending specialist care to remote areas

Telemedicine sessions also help to address resourcing difficulties at hospitals outside urban areas, where doctors often lack

CAREN: a modern Silk Road

For many centuries, the Silk Road was the long-distance route through which Asia and Europe traded and communicated. Today, CAREN is upgrading this ancient trade route to a high-speed internet highway, connecting researchers and educationalists throughout the region. Launched in 2009, CAREN – now in its third phase – currently interconnects R&E communities in Kyrgyzstan and Tajikistan, with plans to re-connect Kazakhstan and Turkmenistan. Uzbekistan is a candidate for future inclusion. Links to other continental networks, such as GÉANT, give CAREN worldwide reach, allowing seamless co-operation between scientists, academics and students in Central Asia, Europe and the rest of the world.

Until August 2019, CAREN3 is co-funded with €10M by the European Union through the European Commission's Directorate-General for Development and Cooperation, with extra funding being provided by participating countries.

"As well as reducing unnecessary costs and travel times, reliable video conferencing is allowing hospitals to create networks to provide each other with support and consults. By easily sharing our expertise and best practice outside our own institutions, doctors can offer incredible value to their medical colleagues and those colleagues' patients."

Ainagul Jumagulova, Director of the National Center of Cardiology and Internal Medicine in Bishkek, Kyrgyzstan

specialised skills. Thanks to CAREN and the national Central Asian networks, patients can now be diagnosed and treated at an earlier stage, improving outcomes and reducing costs.

Plans for the future

Supplementing traditional care with a telemedicine scheme offers doctors across Central Asia a new way to interact and learn from each other with potential for directly improving patient care. Today discussions are underway to extend the programme beyond cardiology. The Central Asian NREN and medical communities are working hard to leverage the power of research and education networks by connecting medical professionals across the region and other parts of the world.

An Asian success story

Growth of telemedicine across Asia-Pacific is closely linked with Professor Shuji Shimizu at Kyushu University Hospital in Japan, Director of the Telemedicine Development Centre of Asia (TEMDEC). Running since 2002, TEMDEC enables remote training of surgeons and the spread of best practice by using research and education networks to transmit high-quality, real time images of a live surgery event to multiple locations, thus spreading best practice and knowledge transfer.

Over the last decade, 441 operations and consultations have been shared over TEIN and other academic networks, bringing together surgeons at 310 institutions in 46 countries.

For more information:

CAREN: <https://caren.geant.org>

GÉANT: www.geant.org

EU: <https://ec.europa.eu/europeaid>



EU-funded project