

## TEIN2 NETWORK DELIVERS HEALTHCARE KNOWLEDGE TRANSFER IN ASIA PACIFIC



Access to medical care is a fundamental human right. However for many across the world, poverty, geographic remoteness and lack of specialised resources mean that healthcare is unavailable, holding back progress and harming life expectancy. Extending existing healthcare to cover the global population is therefore a major goal and technology has a strong role to play in this through telemedicine. By using advanced networks such as TEIN2 to link doctors and their patients through voice, video and medical applications irrespective of location, telemedicine can have a major humanitarian impact and dramatically improve quality of life for millions.

As well as using telemedicine to allow remote medical diagnosis it provides the ability to share expertise across countries and continents, train surgeons through video links and bring together experts on an international scale who can collaborate and share their own knowledge on global epidemics. Previously these benefits were the province of richer countries – telemedicine opens this up to everyone.

### TEIN2 – delivering telemedicine to bridge the digital divide

Pioneering telemedicine in action is the Trans-Eurasia Information Network 2 (TEIN2) network. A dedicated research network for the Asia-Pacific region, TEIN2 spans China, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Thailand, Vietnam and Australia and supports a global community of over 30 million users.

Co-funded by €10 million from the European Commission and run by international networking organisation DANTE, one of the key aims of TEIN2 is to bridge the digital divide and deliver major benefits to society. Telemedicine has been at the forefront of TEIN2's work since it went live in January 2006. A teleconsultation between the Royal Children's Hospital in Melbourne, Australia and the National Paediatrics Hospital in Vietnam was part of the official launch of TEIN2, showing how central healthcare is to the network.

- Working with regional networking organisations such as Asia Pacific Advanced Network (APAN) and individual telemedicine groups, TEIN2 has been deployed for a number of high profile projects including training, sharing expertise remote consultation and epidemic prevention and management.

### Telemedicine for training

The central idea behind surgical training has not changed for hundreds of years – in essence, watch, learn and then participate in operations. However providing access to operating theatres is often difficult due to space and hygiene considerations. This has led to most theatres now being equipped with multiple high quality cameras that beam pictures out to nearby training rooms where students can watch, ask questions and learn new skills. By connecting hospitals via the TEIN2 network, surgery can be viewed by students wherever they are across the region. This would not be possible over existing commercial networks as they cannot offer the amount of continuous high bandwidth necessary. Given the fast pace of surgical change, access to the latest procedures is of equal benefit to all countries, irrespective of their development stage.

A notable pioneer in sharing training across the region has been the AQUA project set up by the Medical School of Kyushu University in Japan. It has been using TEIN2 to demonstrate and train on a number of techniques, including laparoscopic gastric surgery, which brought together medical staff from Korea, Malaysia and Philippines. More than 100 other demonstrations have taken place including neurosurgery, endoscopy and colon surgery.



Patient Clinic in Laboratory  
(Australia's CSIRO)

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*Dr Shuzi Shimizu, Department of Endoscopic Diagnostics and Therapeutics Kyushu University Hospital, Leader of AQUA and Chair of the APAN Medical working Group*



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"The TEIN2 network has allowed the Asia-Kyushu Advanced Medical Network to extend its reach to Vietnam, Philippines, Indonesia, Malaysia, Thailand and China as well as enhancing connections to Singapore and Australia," commented Dr Shuzi Shimizu, Department of Endoscopic Diagnostics and Therapeutics Kyushu University Hospital, Leader of AQUA and Chair of the APAN Medical working Group. "Using television-quality video to remotely watch live keyhole surgery undertaken in other countries, sometimes thousands of miles away has resulted in a disruptive change to the way telesurgical training is done. As soon as surgeons see the quality of remote telesurgery training and mentoring they want to participate. All of this has been made achievable by TEIN2 and its partner networks."

## Sharing expertise across borders

Sharing expertise, particularly between developed and developing countries is critical to building up skills as well as saving lives. In many cases visiting specialists have a limited amount of time to spend with patients so the ability to carry out initial consultations and follow up remotely through video links maximises their in-country time.



Cleft lips and palates are a common but distressing disfigurement in countries such as Vietnam. Australian orthodontist Dr Michael Snow of the Clefts and Facial Anomalies Clinic at Monash Medical Centre, Clayton, Melbourne, Victoria - visits three city-based hospital clinics in Vietnam, at least three times a year to assess, operate and follow up with affected children with oro-facial clefts. Working with Dental Logistics he has developed and manufactured a broadband enabled orthodontic chair with built in cameras and multiple interactive screens. This enables him to remotely examine patients using the TEIN2 network, thereby further building trust with local medical teams, patients and their parents. Through teleconsultation he will be able to increase the number of patients he treats while still delivering appropriate comprehensive care with the attending local clinicians.

## Containing epidemics

Dealing with epidemic and pandemic outbreaks requires fast and comprehensive co-ordination between a wide range of experts, normally spread over a large area. A number of simulations of how TEIN2 can be used to fight epidemics have already been carried out. This included a interactive teleconference focussed on Avian flu. Held in Manila this brought together regional experts with colleagues across the world.

"Advanced networks like TEIN2 allow Malaysia to engage with experts in other countries using its high quality and extensive connectivity. This will be particularly important if a pandemic outbreak were to occur as movement of people in affected areas becomes highly restricted. The ability to access experts from other countries and to send the large amount of data collected for analysis wherever the best resources are, coupled with the ability to have external experts provide advice, assessment and consultation using a virtual environment adds a whole new dimension that will help control and mitigate a pandemic outbreak. This would not be possible without TEIN2 and its partner networks" said Professor Suhaimi Napis from Plant Molecular Biology and Bioinformatics Faculty, Universiti Putra Malaysia.

DANTE's David West, TEIN2 Project Manager said, 'For the first time we have seen medical professionals in all developed and developing TEIN2 partner countries able to work together across the TEIN2 network. Such collaborations are clearly of vital importance to help tackle such major worldwide challenges as Avian flu and level up the medical expertise across the region. All the demonstrations are a perfect illustration of how superior acoustic and picture quality delivered over the TEIN2 network can support the virtual working practice of medical experts across multiple countries.'

This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of DANTE and can under no circumstances be regarded as reflecting the position and opinions of the European Union.

*Images courtesy of AQUA and Remote Immersive Diagnostic Examination System, which was supported in Australia by the Australian Government through the Advanced Networks Program (ANP) of the Department of Communications, Information Technology and the Arts, and by the CSIRO ICT Centre. The clinical partners in developing this system were Dr John Meara, Dr Leo Donnan, Dr Andrew Greensmith and Dr Wellington Davis at Royal Children's Hospital, Melbourne, and Dr John Lambert at Orange Base Hospital.*

## Find out more

To learn more about TEIN2 and education and research networking, visit [www.tein2.net](http://www.tein2.net)

DANTE is a not for profit organisation that operates the GÉANT2 network and manage the TEIN2 project. Further information about DANTE and its activities can be found at [www.dante.net](http://www.dante.net)