Asia-Pacific Medical Network Project
in Kyushu University Hospital

Telemedicine Development Center of Asia
About TEMDEC

The aim of the center is to establish effective and consistent medical communications among Asian countries using high-speed Internet and advanced technologies. Our main activities are as follows.

- **Remote medical education**
  - Organizing event programs and preparations.

- **Remote patient care**
  - Teleconsultations and arrangements for international patient care.

- **Development and application of new technologies**
  - For more connections and improved images.

- **Development of interesting content**
  - Consistent search for new applications.

- **Secretariat of the Medical Working Group of Asia-Pacific Advanced Network**
  - APAN (http://apan.net/)

- **Center for international exchange programs**
  - Invitation of foreign medical doctors.

Our telemedicine activities began in 2002, when Korea and Japan co-hosted the Football World Cup, and these two countries were connected by a large fiberoptic network. The "Genkai Project" was organized by industry, government, and educational groups to accelerate the mutual remote communications in various fields such as education, culture, and business. Kyushu University Hospital joined the project with a medical team.

With support from the Core University Program of the Japan Society for the Promotion of Science (JSPS) and Kyushu University Interdisciplinary Programs in Education and Projects in Research Development (P&P), our activities have expanded to throughout Asia under the "Asia-Kyushu Advanced Medical Network (AQUA)", which was organized in 2005.

With rapid and widespread recognition of these activities, Kyushu University Hospital formally opened a new office, the Telemedicine Development Center (TEMDEC) of Asia, in October 2008, which took over the role of AQUA to lead international telemedicine.
Greetings from Director

Our purpose is to organize interesting and useful remote education programs with interactive discussion throughout Asia, by taking full advantage of high-speed academic Internet and advanced technologies. New medical knowledge and advanced surgical procedures are shared routinely and consistently across geographic borders.

With reliable and solid teamwork between medical and engineering staff, we are now expanding these activities from Asia to the rest of the world. Furthermore, the application of the system to real patient care is our next goal.

TEMDEC will be incorporated into the newly-organized International Medical Division from April of this year, which is to cover all international affairs of the hospital, including remote education, personnel exchanges, and patient care.

We sincerely appreciate your kind cooperation and great support.

April 2015
Director, TEMDEC
Shuji Shimizu, MD PhD
2002
May. FIFA World Cup soccer games co-hosted by Korea and Japan.
Nov. Kyushu University Hospital joined the Hyeonhae/Genkai Project with a medical team.

2003
Jan. 2-Gbps fiberoptic cable laid between Pusan, South Korea and Fukuoka, Japan.
Feb. The first DVTS (digital video transport system) teleconference between Korea and Japan held.
Apr. Core University Projects started.
Aug. The first live surgery via teleconference performed and released to the media.

2004
Jan. Connection to United States of America (Hawaii) established.
Jul. Connection to Australia established.
Oct. Connection to China established.
Dec. Connection to Taiwan established.

2005
Jan. Connection to Thailand established.
Mar. Successful DVTS connection of four institutions (Fukuoka, Seoul, Beijing and Taipei).
Apr. Kyushu University Interdisciplinary Programs in Education and Projects in Research Development (P&P) started.
Apr. AQUA (Asia- Kyushu Advanced Medical Network) was formed.
Aug. Medical Working Group formally approved at the 20th APAN-Taipei.
Nov. Connection to Singapore established.

2006
Apr. Asian Core Program started.
Jun. Connection to Vietnam established.
Jul. Connection to Hong Kong and Indonesia established.

2007
Jan. DVTS connection to the Philippines, India and Malaysia.
Mar. Live surgery was released with HD quality.
Apr. Japan-China Medical Exchange Program started.
Jun. The number of events reached 100.
Aug. The first connection to Europe (Germany, France) established.
Dec. Strategic Program for Building an Asian Science and Technology started. Community. The 1st Asia Telemedicine Symposium was held.

2008
Apr. Grant-in-Aid for Scientific Research (B) started.
Sep. Connection to Czech Republic and Spain established.
Oct. "Telemedicine Development Center of Asia" opened. Masao Tanaka named director of TEMDEC.
Dec. The 2nd Asia Telemedicine Symposium held in Seoul.
2009
May  The first connection to Africa (Egypt) established.
Jun.  Connection to Norway established.
Jul.  The first connection to Latin America (Brazil) established.
Oct.  Connection to Mexico established.
Dec.  The 3rd Asia Telemedicine Symposium held in Fukuoka, Japan.

2010
Apr.  Special Education and Research Fund started.
Nov.  Connection to Chile established.

2011
Mar.  Telemedicine conference room at TEMDEC completed.
Apr.  Grant-in-Aid for Scientific Research (A) started.
Apr.  Accepted to Invitation Program for East Asian Young Researchers.
Apr.  The first use of the Vidyo system.
Oct.  Research Fellow employed as dedicated staff.
Dec.  The 5th Asia Telemedicine Symposium convened in Fukuoka.

2012
Mar.  Connection to Nepal established.
Apr.  Dr. Shuji Shimizu named director of TEMDEC.
Apr.  Internationalization Project Team launched as part of the National University Hospital Council of Japan.
Dec.  The 6th Asia Telemedicine Symposium convened in Fukuoka (10-year anniversary meeting).

2013
Jan.  Our activities were featured in a New Year’s special program of The Sankai Shimbun.
Jan.  DVTS multi-point connection using Quatre-16.
Jan.  Successful endoscopy DVTS conference with Latin America.
Apr.  Expansion into Central Asia.  Connection to CAREN.
Jun.  The first implementation of video conference streaming.
Jul.  The first live surgery using a cadaver.
Jul.  DVTS connection to Colombia.
Oct.  Grant of The Clinical Research Promotion Foundation started.
Nov.  Accepted to special category of Kyushu University Interdisciplinary Programs in Education and Projects in Research Development.  (P&P)
Dec.  The 7th Asia Telemedicine Symposium convened in Bangkok.

2014
Feb.  The 1st International Project Team Meeting of the National University Hospital Council of Japan held with connection 28 national universities via Vidyo.
May  The first live demonstration held at the 87th Congress of the Japan Gastroenterological Endoscopy Society.
Jul.  The 1st Child Cancer teleconference was held.
Sep.  The 2nd International Project Team Meeting of the National University Hospital Council of Japan held in connection 28 national universities using H.323.
Nov.  The first live demonstration from Japan broadcast to Mexican Digestive Disease.
Dec.  The 8th Asia Telemedicine Symposium convened in Fukuoka, co-organized with the National University Hospital Council of Japan.
Dec.  The number of events reached 500.

2015
Jan.  Accepted to Japan Society for the Promotion of Science (JSPS) Core-to-Core Program.  Asia-Africa Science Platforms.
Jan.  The International Medical Department decided to set.
Mar.  TEIN4 project was accepted.
# Special Interest Group (SIG)

## Endoscopy

<table>
<thead>
<tr>
<th>Name</th>
<th>Country</th>
<th>Main Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korean Society of Gastrointestinal Endoscopy</td>
<td>Korea</td>
<td>Joon-Soo Hahm/Ho-Soon Choi</td>
</tr>
<tr>
<td>Korean Pancreatobiliary Association</td>
<td>Korea</td>
<td>Joon-Soo Hahm/Ho-Soon Choi</td>
</tr>
<tr>
<td>Korea-Singapore-Japan GI Teleconference</td>
<td>Korea</td>
<td>Joon-Soo Hahm/Ho-Soon Choi</td>
</tr>
<tr>
<td>Thai Association of Gastroenterology</td>
<td>Thailand</td>
<td>Rungsun Rerknimitr</td>
</tr>
<tr>
<td>Society of Gastrointestinal Intervention</td>
<td>Korea</td>
<td>Dong-Wan Seo</td>
</tr>
<tr>
<td>Hong Kong Live Endoscopy</td>
<td>Hong Kong</td>
<td>James Lau</td>
</tr>
<tr>
<td>Konkuk Live Endoscopy</td>
<td>Korea</td>
<td>Chan-Sup Shim</td>
</tr>
<tr>
<td>Indonesia Endoscopy</td>
<td>Indonesia</td>
<td>Dadang Makmun</td>
</tr>
<tr>
<td>Mexico Endoscopy</td>
<td>Mexico</td>
<td>Miguel Tanimoto</td>
</tr>
<tr>
<td>ERCP Teleconference</td>
<td>Japan</td>
<td>Kiyohito Tanaka</td>
</tr>
<tr>
<td>Latin Endoscopy</td>
<td>Mexico</td>
<td>Kenshi Yao/Miguel Tanimoto</td>
</tr>
<tr>
<td>ECE (Endoscopy Club E-conference)</td>
<td>Malaysia</td>
<td>Shiw-Hooi Ho/Rungsun Rerknimitr</td>
</tr>
<tr>
<td>World Gastroenterology Organization</td>
<td>United States</td>
<td>Shuji Shimizu</td>
</tr>
</tbody>
</table>

## Multiple fields

<table>
<thead>
<tr>
<th>Name</th>
<th>Country</th>
<th>Main Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>National University Hospital Council of Japan</td>
<td>Japan</td>
<td>Shuji Shimizu</td>
</tr>
<tr>
<td>Choray-Tsukuba Teleconference</td>
<td>Japan</td>
<td>Minoru Akiyama</td>
</tr>
<tr>
<td>PT</td>
<td>Japan</td>
<td>Shuji Shimizu</td>
</tr>
<tr>
<td>Tsukuba</td>
<td>Japan</td>
<td>Minoru Akiyama</td>
</tr>
</tbody>
</table>

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5  Telemedicine Development Center of Asia
Technology Available at TEMDEC

We use several systems for our purposes. For instructions on how to use each, please refer to our homepage. Our equipment is also available for free rent. Please inquire for further details. (http://www.temdec.med.kyushu-u.ac.jp/eng/equipment_available.html)

Main communication systems for teleconferencing

**DVTS**
Digital Video Transport System
Terminal Style

- **Low compression & high bandwidth**
- **Transfer of high-quality video by IEEE1394**
- **Free software**

**DVTS package available for hire includes:**
- A/D converter
- Portable audio mixer
- Microphone
- IEEE1394 cable
- DV camera
- Headphone
- AV cables
- Tripod
- Miscellaneous other equipment

**Required equipment**
- IEEE1394-enabled PC (Windows XP/7/8)
- Display & speaker
- DVTS software for Windows
- MCU
- apanmed1: 4 sites (GUI), 16 sites (CUI), VPN
- apanmed2: 4 sites (GUI), 16 sites (CUI)
- TEMDEC: 7 sites (GUI)

**H.323**
Terminal Style
Video Conference System

- **General video conference system**
- **Connectable with H.323 endpoint of other manufacturers**

**Our endpoint**
- Polycom HDX9001
- Sony PCS-XG80
- LifeSize Team HD220
- Cisco SX20
- LifeSize Softphone
- MCU
- Polycom RMX1500: HD quality, 4 Mbps, 12 sites
- Cisco TelePresence MCU5300: HD quality, 4 Mbps, 40 sites (prior booking is required)

**Vidyo**
Client-Server Style
H.264/SVC Video Conference System

- **High quality & low delay**
- **Multipoint teleconference without MCU**
- **Accessible from various kinds of devices**
- **Streaming function**

**Full HD video conference device**
- VidyoRoom HD230/220/100/40
- Endpoint software
- VidyoDesktop (Win/Mac)
- VidyoMobile (smartphone/tablet)
- Server
- VidyoPortal for TEMDEC: 23 sites, streaming/recording, gateway connection, AES encryption, VPN-enabled, endpoint software download license (x2600)
- VidyoPortal for Child Cancer Project: 20 sites, AES encryption, endpoint software download license (x1000)
## Tools for more effective communication

### Annotation tool & Telepointer

A cursor position sharing system and drawing system to make teleconferences more informative and interactive.

### Streaming

One-way teleconference streaming is available by the Vidyo system. Users receive HD-quality video to on their PC web browser at 1-2 Mbps. Up to 300 sites.

### Chat

Text chat capability is important for communication between engineers and participants in teleconferences. We use a group chat with all participating sites to check each situation during large conferences.

## Research and Education Network

### A network to enable high-speed communication with large bandwidth capacity

Kyushu University has an advanced network environment that is connected with national and international academic research institutes through the Science Information NETwork (SINET), Asia-Pacific Advanced Network (APAN), Trans-Eurasia Information Network (TEIN) and other research and education networks.

## Comparison of systems  (TEMDEC as of March 2015)

<table>
<thead>
<tr>
<th>System</th>
<th>DVTS</th>
<th>H.323</th>
<th>Vidyo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Software</td>
<td>Hardware</td>
<td>Software</td>
</tr>
<tr>
<td>Resolution</td>
<td>SD</td>
<td>SD or HD</td>
<td>SD or HD</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>30 Mbps</td>
<td>1-10 Mbps</td>
<td>2 Mbps</td>
</tr>
<tr>
<td>Camera</td>
<td>Video camera</td>
<td>Video camera</td>
<td>Web camera</td>
</tr>
<tr>
<td>Content-Sharing</td>
<td>Yes</td>
<td>Yes</td>
<td>Partial</td>
</tr>
<tr>
<td>Global IP</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Price (USD)</td>
<td>Free</td>
<td>$10000</td>
<td>$200</td>
</tr>
<tr>
<td>Scale</td>
<td>8 sites</td>
<td>20 sites</td>
<td>20 sites</td>
</tr>
<tr>
<td>Difficulty level</td>
<td>Engineer required</td>
<td>Easy</td>
<td>Easy</td>
</tr>
</tbody>
</table>

- **DVTS**: Tools for more effective communication
- **H.323**: Research and Education Network
- **Vidyo**: Annotation tool & Telepointer
Check list for starting telemedicine

Do you want to join? Before you send us an inquiry e-mail…

● To Doctors

☐ Be sure you have engineers who can handle network and audiovisual requirements.
☐ Please verify the institutions with which you wish to connect.
☐ Please have a telemedicine program prepared.

● To Engineers

☐ Please check your commercial network, research and education network, and outside router.
☐ Please check the bandwidth of your network (in M/Gbps)
☐ Please check whether you can use global IP.
☐ Please check that you can use a conference room for teleconferencing.
☐ Please check the equipment available in your conference room.
  ☐ Display or projector
  ☐ Video camera
  ☐ Web camera
  ☐ Microphone
  ☐ Speaker
☐ Please check whether you have an H.323 video conference system.
  ☐ Model code (Sony XG-80, Tandberg 880MXP, etc.)
  ☐ Resolution (SD / HD)
  ☐ IP address (public / private? Static / DHCP?)

☐ Please check whether you have an H.323 video conference system.
  ☐ Model code (Polycom RMX 1500, etc.)
  ☐ Connectable number of sites

☐ If you have another system for teleconferencing, please check the details.
Collaborations

APAN
APAN (Asia-Pacific Advanced Network) is a non-profit international consortium established in 1997. APAN connects research and education networks of each country, and is designed to be a high-performance network for research and development on advanced next generation applications and services. The Medical Working Group was organized in 2005, and Kyushu University Hospital has been the secretariat for all telemedicine activities. (http://apan.net/)

TEIN
TEIN (Trans-Eurasia Information Network) is a high-speed network for research and education, which connects 20 countries in Asia and 34 countries in Europe. This network is actively being used for international joint research in cutting-edge areas, including information telecommunications and bioengineering. TEIN*CC was established to manage the fourth phase of the TEIN project and the latter was adopted as one of the Asia-Europe Meeting projects. (http://www.tein.asia/)

National University Hospital Council of Japan
In 2012, the Globalization Section was established at the National University Hospital Council of Japan, and as an International Project Team, we began to support internationalization of Japanese national university hospitals. The aim is to build a health care system that will lead the world, to promote global personnel exchanges, to globally share medical information, and to strengthen the competitiveness of advanced medicine. (http://www.univ-hosp.net/english/internationalization/)

Kyushu – Okinawa area Child Cancer Project
We support build up the network between Kyushu University hub medical institutions and related pediatric cancer treatment hospitals.