Video Collaboration for Healthcare
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Reacts, or “Remote Education, Augmented Communication, Training and Supervision” is developed by Montreal-based Innovative Imaging Technologies Inc.

At its core, Reacts is a digital platform featuring cloud computing and integrated software components that is accessible via current consumer operating systems. It enables secure two-way video and audio communication, and much more.

The Reacts solution reinvents digital collaboration through unparalleled flexibility and interactivity, which the IIT team calls “hyper-presence”. It provides a secure and intuitive way to interact with colleagues, patients, clients or friends.

Initially developed to address the lack of adequate solutions in the healthcare sector, this platform was designed to meet the most stringent performance and security standards, regardless of industry type or sector.

There’s still room to innovate before information technology (IT) better serves the needs of patients, physicians and professionals in care delivery; the Reacts platform fulfills the healthcare system’s expectations.
Founded in 2012 by Dr. Yanick Beaulieu, Innovative Imaging Technologies consists of a multi-disciplinary team built around a dedicated core of multimedia and software development experts. This passionate, seasoned team leverages the full extent of its talent to roll out Dr. Beaulieu’s innovative and visionary project, which aims to reinvent the interactivity and dynamic performance of multimedia collaboration and enable “hyper-presence”.

IIT’s current team consists of over a dozen employees, as well as a board of directors comprised of five members. Its offices are located in Montreal’s Griffintown multimedia cluster (Quebec, Canada).

Dr. Beaulieu is an Assistant Clinical Professor at the University of Montreal’s Faculty of Medicine. He also works as a cardiologist and intensive care specialist at the Hôpital du Sacré-Cœur de Montréal. Moreover, he has been leading IIT’s team through the Reacts project since 2012.

Dr. Yanick Beaulieu
IIT founder and President, creator of Reacts
Current issues

The use of video and audio collaboration tools in healthcare is presently limited. However, many current health system issues could be resolved, at least partially, with the help of adequate tools. Indeed, there are several consultative, communication and collaborative needs that affect the healthcare system’s various stakeholders.

Current patient issues:

• Access to non-urgent and specialized care is often difficult to obtain.

• Wait times for some types of healthcare services may be quite long, especially during unexpected service interruptions (e.g. sick leave) or shortages of medical or professional resources.

• Travel to an urban center may be required to receive specific medical care or exams, which may have a considerable impact on the quality of life, finances and productivity of both patients and their loved ones.

• The quality of life of patients suffering from chronic illnesses requiring regular visits to healthcare facilities for treatment is undermined by these frequent travels, especially in the case of vulnerable individuals.
Professionals and physicians face the following challenges:

- The need to consult specialists to obtain expert advice on specific cases, either individually or within team discussions.

- The need to effectively disseminate their expertise to their colleagues, as well as provide coaching and mentorship in real-time.

- In some cases, the need to observe patients in their everyday environment, especially in rehabilitation cases.

- The need to provide clinical expertise coverage beyond office hours, requiring on-site presence or proximity to care facilities when ‘on call’.

- Dealing with certain patients’ frustrations concerning the inflexibility of traditional methods of providing care within modern settings.

- The need to have access to continuing professional development opportunities, as required by their profession. While a training program’s didactic material is available via e-learning, DVDs, CD-ROMs, websites and reference guides, the practical portion, regarding a topic’s more procedural and technical aspects, is the most vital component.
Telehealth, meaning the act of providing remote care through information and communications technologies, is currently not being used anywhere near its full potential. When it is employed, it is often with a negative return on investment for health organizations.

The creation of health organizations with public-centric responsibilities, as well as the governments’ willingness to consolidate clinical continuums, requires breaking down walls and implementing effective means to support professional and inter-organizational collaboration. Moreover, the hierarchy of services requires the creation of channels to facilitate access to cutting-edge expertise and foster knowledge transfer.

Many inter-facility patient transfers and hospitalizations could be avoided if earlier knowledge-sharing would take place between care-giving teams.

Reliability, traceability and security requirements pertaining to information systems used in clinical settings, combined with a complex environment and extensive geographic distribution, make most current video collaboration solutions inadequate for clinical use.

The implementation of innovative telehealth solutions is often delayed by a cumbersome decision-making and sourcing process, while information and communication technologies (ICT) have been evolving at an exponential rate over several decades.

Due to the current demographic and fiscal context, public health systems are facing a growing imbalance between healthcare supply and demand for an aging population. Consequently, decision-makers are constantly looking for sources of savings and service optimization.
The image below illustrates the usage needs of a wide variety of professionals and physicians in a typical hospital setting for remote collaborative communication tool:

Current technological infrastructure

Provincial governments have injected considerable funds into the implementation of videoconferencing networks in their respective territories since the turn of the century, specifically through government’s investment programs. Most hospitals now have access to videoconferencing capabilities due to bandwidth reserved for said activities, as well as professional equipment installed in dedicated areas.

This equipment may come in the form of mobile carts, ranging from $5,000 to $40,000 per unit, or as integrated videoconferencing rooms, typically between $50,000 and $150,000 per unit, with costs varying widely based on the complexity of the installation process and the physical space to be equipped.

As federal investment programs are often limited in this sector, provinces now face the challenge of making these facilities sustainable in a difficult economic context. In Quebec, for example, no asset maintenance program has been planned to enable health facilities to budget for the replacement of videoconferencing equipment at the end of its operating life.
Limitations of the current technology

The current technological infrastructure of many healthcare systems features considerable limitations that prevent across-the-board deployment of telehealth and video collaboration equipment. These limitations include:

- High equipment costs and the lack of financing to update it.
- The equipment’s complexity, which requires technical support and user training that are seldom available.
- A lack of space in many healthcare facilities for videoconferencing equipment installations.
- The equipment’s lack of availability in smaller health organizations or service centers due to its high costs, among other factors.
- The limited performance capabilities of elements linking videoconferencing systems, thereby restricting access and the amount of simultaneous sessions.
- The reservation system’s complexity, which requires coordinating the availability of videoconferencing rooms, equipment and personnel across several organizations.
- The lack of equipment adaptation for clinical or training applications, as they have been designed for administrative meetings in a corporate context.
- The impossibility of communicating directly with physicians, professionals or patients in their homes mobile or via digital devices.

These numerous limitations end up severely limiting the application of current technological solutions to meeting the healthcare systems’ needs. Indeed, it is mostly used for administrative purposes, specifically during remote group meetings. These systems have had limited success at the educational level, especially as part of structured training programs offered by university health centers. Moreover, clinical applications have been relegated to marginal usage, far from fulfilling the aforementioned demand and the potential of a flexible and high-performance solution, such as Reacts.
The Reacts platform

React is the optimal solution to telehealth’s current and future needs.
Reacts Main Features

<table>
<thead>
<tr>
<th>Capabilities</th>
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<tbody>
<tr>
<td>• Software solution that doesn’t require any specific hardware</td>
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<td>• Easy installation</td>
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<td>• Can be used from the user’s terminal (desktop, laptop, tablet)</td>
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<td>• Available in multiple languages (English, French, Spanish, Portuguese)</td>
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<tr>
<td>• Highly secured, high-quality audio and video communication</td>
</tr>
<tr>
<td>• Available on several platforms: Windows 7 or higher, iOS (lite version)</td>
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<tr>
<td>• Synchronous (real-time) or asynchronous* (“store and forward”) modes</td>
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<tr>
<td>• Incorporates cutting-edge technologies (multiple simultaneous audio-video</td>
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<tr>
<td>inputs, augmented reality, 3D objects, image overlay, etc.)</td>
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<tr>
<td>• Screen sharing for imaging data (CT scan, X-rays, etc.); file sharing (documents,</td>
</tr>
<tr>
<td>images, videos, etc.)</td>
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<tr>
<td>• Reporting and checklist tools*</td>
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<tr>
<td>• Advance session planning</td>
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<tr>
<td>• Can be used by both healthcare professionals and patients</td>
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<tr>
<td>• Point-to-point communication, multipoint communication*</td>
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<tr>
<td>• Low registration costs</td>
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<table>
<thead>
<tr>
<th>Highly secured</th>
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<tr>
<td>• Each client uses a personalized channel (TLS/SSL)</td>
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<tr>
<td>• All channels are secured (TLS)</td>
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<tr>
<td>• Features Symantec’s VeriSign security certification</td>
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<tr>
<td>• Data encryption</td>
</tr>
<tr>
<td>• Logs available for traceability</td>
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<tr>
<td>• Strong identification</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Technological prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Windows 7 or higher (standard version); iOS 7.0 (lite version)</td>
</tr>
<tr>
<td>• Webcam, microphone and speakers</td>
</tr>
<tr>
<td>• Internet connection (min. bandwidth of 500 kbps per camera)</td>
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<table>
<thead>
<tr>
<th>License</th>
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<tbody>
<tr>
<td>• Annual license fees of $84 per user</td>
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<table>
<thead>
<tr>
<th>Technical support</th>
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<tr>
<td>• Available at no charge (web, e-mail, telephone)</td>
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* Available in 2015
Simple, intuitive to use

Clear menus accessible via the home page

“Face-to-face” mode for live discussions
Secure collaboration

“Session” mode enables camera, image, file and video sharing, as well as the use of augmented reality and application sharing (ex. PACS), among other functions.

Multiple audio-video inputs (cameras, patient monitor, ultrasonography, etc.) may be broadcast simultaneously.
Live imaging exam transfer, PACS sharing

Ability to view and supervise ultrasonography exams (as well as other types of imaging exams)

Ability to consult radiology exams from remote PACS via secured application sharing.
Integration of augmented reality and image merging

Live use of image or virtual 3D object overlay enables virtual assistance to guide practitioners during a procedure, technique, surgery, etc.
Remote training and educational tool

• Ability to prepare and record presentations directly on the platform for future remote broadcast.

Image capture and annotation to optimize patient follow-ups

• Ability to take screenshots and annotate them, e.g. in order to track the evolution of a patient’s wounds. Data is encrypted and saved to a file created by the professional.
Licensing fees

- $84 annual fee for a non-transferable license, for unlimited use of the Reacts platform by a single individual, including all solution updates and upgrades, as well as technical support.

- Organizations can determine what portion of the license is paid for by the user.

- Users can register directly online, or an organization’s program administrator can do so on their behalf.

- Customizable user accounts: contact list, personal file directory, session recordings, checklists, planned sessions.

- Other options available based on organizational needs.

Technical requirements

- Desktop, laptop or tablet
  - Microsoft Windows 7 or higher.
  - iOS 7.0 (lite version).
  - i5 processor or better / 4 Gb of RAM / 500 Mb of disk space (the application only requires 50 Mb to run, but space must be set aside for file saving and sharing).

- High-definition camera (720p min. resolution), either built in or as an external attachment.

- Microphone
  - Built-in model or attachment for one-on-one communication.
  - Omnidirectional model recommended for group communication.

- Speakers with echo cancellation feature or headphones.

- Connection requirements:
  - Minimum bandwidth of 0.5 Mbps. (2 Mbps optimal) for the broadcast of a single video signal.
  - Additional 0.5 Mbps (minimal) to 1 Mbps (optimal) for each additional camera.
  - Additional bandwidth is required when several functions are used at the same time (i.e. file transfer, screen sharing, etc.).
  - Ability to manage bandwidth during the session.
Reacts uses XMPP technology and the jingle library to provide peer-to-peer (P2P) streaming capabilities. This foundation provides ZRTP and SRTP encryption to the audio and video streams. Additionally, the session control between peers (signaling) always uses TLS secured tunnels. In networks where stream connections between peers are not possible, IIT provides a TLS secured tunnel to its servers to bridge the communication between peers in a secured way.

- Servers are hosted by a secure data center in Quebec, with redundancy in a second secure center in the same province.
- ZRTP/SRTP, TLS coding
- Symantec’s VeriSign security certification
- Strong identification
- Logs available

Highly secured connection both within and outside of the healthcare system
Security (continued)

IIT Reacts connectivity chart

NOTE:

All connections are outbound on port 443 and use secured tunnels.

- All tunnels are coded using SSL3 or better.
- All tunnels go through the standard http protocol navigation process.
- A secondary data center replicates Hypertech’s configuration for disaster recovery purposes.
Remote collaboration must follow the following core principles:

- Confidentiality
- Security
- Traceability
The following table compares key features of popular videoconference platforms and standard Videolink with the Reacts solution.

### Comparative Overview

<table>
<thead>
<tr>
<th>Features</th>
<th>Skype</th>
<th>Google Hangout</th>
<th>VSee</th>
<th>GoToMeeting Webex, Jabber, etc.</th>
<th>Visioconférence Standard</th>
<th>Reacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web-based audio-video conferencing</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>Application sharing</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Storage space</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$</td>
<td>x</td>
</tr>
<tr>
<td>Session recording</td>
<td>-</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>$</td>
<td>x'</td>
</tr>
<tr>
<td>Group conference</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x'</td>
</tr>
<tr>
<td>Drawing tools</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>$</td>
<td>x</td>
</tr>
<tr>
<td>Multiple input</td>
<td>-</td>
<td>-</td>
<td>x</td>
<td>-</td>
<td>$</td>
<td>x</td>
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<tr>
<td>Augmented reality</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>x</td>
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<tr>
<td>Object overlay</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>Snapshots</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>$</td>
<td>x</td>
</tr>
<tr>
<td>Checklist and reports</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>Annotations / asynchronous review</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$</td>
<td>x'</td>
</tr>
</tbody>
</table>

*Not available in the platform's initial version; will be included in subsequent versions.*

The functions included in the various products are indicated with an "X" when available, a "$" sign when available at an additional cost, and with a " - " when unavailable.

1 By "additional cost", we mean an amount added to the base licensing cost, either for a service billed at every use or a function requiring additional infrastructure or equipment.
Reacts applications in healthcare

A collaborative platform such as Reacts can have several applications in healthcare. Indeed, this platform not only enables optimization of activities already made possible by existing video collaboration solutions, but also opens new opportunities through its advanced functions. The list of applications below is not exhaustive, but provides relevant examples that illustrate the platform’s potential.

Clinical needs

Teleconference between professional and patient

Teleconsultation sessions may be held between professionals and their patients. The platform features many applications and allows access to care that is often of limited availability, especially in more remote areas.

Reacts benefits for this application:

- **Document sharing**: the Reacts platform enables secure document sharing in real-time, thereby facilitating workflow that is often weighed down during remote consultations. Documents, images and videos that can be shared include patient consent, patient education documents or videos, lab results, imaging test results, etc.

- **Mobility**: since Reacts works on various web-enabled digital devices, professionals, physicians and even patients can participate in consultation from their office, home or any other location with a suitable Internet connection.

- **Recording**: recording collaborative sessions is also possible for all video sources, be it for archiving or training purposes.

- **Reporting**: this function is an integral part of the application. A consultation report may be produced and shared digitally within the same application.
Tele-assistance when care is administered:

The healthcare system includes several specialized resources who are limited in number and whose expertise is regularly sought by their colleagues. A relevant example is tele-assistance for wound care, for which nurses trained in wound care or enterostomal therapy can provide guidance to attending nurses in administering specialized care. This practice avoids having to transfer or move patients, serves as a coaching opportunity and improves access to specialized care.

Reacts benefits for this application:

- **Home care**: tele-assistance is presently limited to inter-facility sessions due to current technological limitations. The Reacts platform allows the extension of tele-assistance to home-care nurses that require remote support. Reacts would help put an end to the common, yet illegal practice of taking photos with personal devices and transferring them via unsecured means.

- **Care standardization**: specialized nurses can provide staff nurses with standardized checklists concerning the treatment being delivered, which fosters care standardization, reinforces training and improves health.

- **Multiple video sources**: a swivel arm-mounted dermatological camera can be positioned right in front of the wound requiring treatment, while a second one can be used to film the nurse’s handling of the patient or give a broader view. This configuration provides a much better view to the specialized nurse operating remotely, who can freely navigate through the video sources to see what’s more relevant at any given time.

- **Snapshots**: snapshots of the wounds can be taken, saved and shared during future sessions. This allows professionals to observe and assess the wounds’ evolution and adds considerable value when compared to live interventions alone.
Telerehabilitation

Professionals can provide physical rehabilitation sessions remotely to patients in their homes.

**Reacts benefits for this application:**

- **Less discomfort for patients:** Reacts helps avoid travel time for patients with reduced mobility, who require access to specialized transportation, or for those with persistent or chronic pain, which is frequently the case with physical rehabilitation.

- **Patient assessment in their daily environment:** the system enables professionals to remotely observe patients in their everyday environment and assess whether it is suited to their health condition. This helps avoid sending occupational therapists on house calls, especially for people with reduced mobility following an accident or the birth of their first child.

- **Possibility of conducting simultaneous sessions:** when a patient participates in a remote telerehabilitation session in their home through Reacts, professionals can give consultations with several patients at once by giving each of them a series of exercises to perform simultaneously. This helps professionals increase their productivity.

- **Pre-recorded exercises:** patients can perform exercises prescribed by professionals while recording themselves using Reacts and following instructions on checklists, images and videos provided by the professionals, who can then review the recordings. This procedure encourages patients to comply with their exercise programs and helps reinforce the training given by professionals.
Tele-emergency

Tele-emergency can be vital for certain patients arriving at the emergency ward. In the case of a patient with multiple traumatic injuries, a child undergoing a pediatric respiratory emergency or a stroke victim, a quick remote consultation with a clinical staff specialist is essential. Reacts enables the contacting of specialized staff physicians from designated expertise centers to assess the situation, advise the emergency physician, recommend treatment and decide whether or not an inter-hospital transfer is required.

Reacts benefits for this application:

- **Remote access to PACS:** Reacts enables medical experts to remotely view and manipulate the PACS visualization software of the healthcare facility where the patient is located. In the case of a stroke, for example, this tool would enable the consulting neurologist to analyze the patient’s computerized axial tomography exam results without having an account in the PACS system.

- **Clinical data sharing in real-time:** The video signal of a physiological monitor, sonography unit or other medical equipment can be shared with the consulting specialist in real-time.
At both the didactic learning and clinical levels, training needs are numerous among students, physicians, nurses and other healthcare stakeholders. Moreover, several disciplines require the learning of technical manipulations or procedures, which involve teacher-led student practice. In this increasingly mobile era, both teachers and students are often in different locations.

Reacts for training needs: the case of guided ultrasonography

Several clinical practitioners across different specialties (emergency, intensive care, rheumatology, internal medicine, etc.) need to learn how to perform guided ultrasonography for various indications, such as ultrasound-guided vein access installation, assessment of free liquid in the abdomen or pleura, focused assessment of cardiac function, assessment of joint effusion, etc. While ultrasound theory is relatively easy to learn through online classes, reference books or a CD ROM, its technical component can prove problematic, as there are many more students than trainers, and both are rarely in the same place, which impedes the regular and efficient dissemination of training.

In a simple process, students can plug an ultrasound device to their computer to send their exam to their remote trainers/supervisors through Reacts. They may also plug in one or more additional cameras to show the placement of the ultrasound probe or needle during ultrasound guidance practice. The remote trainers/supervisors may then observe the exams and provide direct feedback. They may, for example overlay a virtual ultrasound device on-screen to show their students where to place the probe. They may also send video clips or images showing illnesses and use checklists or reports to provide standardized, step-by-step training at every phase of the exam. Students therefore have access to personalized, high-quality clinical supervision without having to go anywhere. Using Reacts makes "longitudinal" training much more accessible and fosters the acquisition and maintenance of both technical skills and theoretical knowledge.
Reacts enables highly interactive remote training and supervision of various techniques, physical exam manipulations, surgical procedures, wound treatment techniques, etc.

**Reacts benefits for this application:**

- Dynamic interaction between students and trainers
- Creative and innovative training methods
- Interactive remote training and support for procedures and techniques
- Integration of augmented reality
- Skill assessment
- Dissemination of instructions and information session
Financial benefits

The following table details the financial benefits of Reacts compared to traditional equipment.

The scenarios described below imply communication between two healthcare centers only, since solutions other than Reacts do not feature video collaboration between a healthcare center and the internet. Estimated costs are determined using prices for similar configurations over the past few years as part of telehealth implementation projects in Quebec’s healthcare network.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Traditional scenario</th>
<th>Reacts scenario</th>
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<td></td>
<td>Required equipment</td>
<td>Estimated costs</td>
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<td>and software</td>
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<td>- Purchasing</td>
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<td>costs: $6,000</td>
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<td>to $35,000 per</td>
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<td>cart, depending</td>
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<td>on models selected</td>
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<td>- Service</td>
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<td></td>
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<td>contract</td>
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<td>starting at $650/year/cart</td>
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<td>$700 for recorder</td>
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<td></td>
<td>Two HD videoconferencing</td>
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<td>Teleconsultation</td>
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<td>omnidirectional</td>
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<td>microphone</td>
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<td>- Three Audiosoft</td>
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<td>cameras on Manfrotto</td>
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<td>swivel arms</td>
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<td>- Geffen digital</td>
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<td>recorder</td>
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<td>Tele-consultation</td>
<td>between 1 expert site</td>
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<td></td>
<td>and 3 remote sites, with session recording</td>
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<td></td>
<td>- Four HD videoconferencing</td>
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<td>carts with omnidirectional</td>
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<td>microphone</td>
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<td>- Three Audiosoft cameras on Manfrotto</td>
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<td>- Geffen digital recorder</td>
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<td>Tele-consultation</td>
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<td></td>
<td>and 3 remote sites, with session recording</td>
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<tr>
<td></td>
<td>- Videoconferencing equipment at third-party</td>
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<tr>
<td></td>
<td>neurologists' office</td>
<td>$20,000 per cart</td>
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<tr>
<td></td>
<td>- Videoconferencing cart for clinical usage at</td>
<td>$1,200</td>
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<td></td>
<td>each primary site</td>
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<td></td>
<td>- PC at neurologists' office to access desegregated PACS</td>
<td>$1,200</td>
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The savings listed above do not take into account the numerous indirect benefits of choosing Reacts technology, namely reduced technical training and support needs; the lack of a central infrastructure to manage; less coordination and administrative time needed, compared to traditional systems; increased personnel efficiencies due to the mobility enabled by Reacts; etc.
“We believe that the Reacts solution’s potential to meet collaborative work needs is very promising, which is why our main objective here at the McGill University Health Centre (MUHC) is to assess this new technological platform in its capacity to optimize service, remote patient tracking and knowledge transfer continuums.”

Madeleine St-Gelais, Inf. M.A.P.
Director, Telehealth Expertise and Coordination Centre
McGill University Health Centre – Montreal, Canada

Testimonials:

“I had the opportunity to use Reacts for remote ultrasound training sessions with small groups, as well as during large-scale educational events. The Reacts platform proved to be an educational tool with enormous potential, as it enables instructors to provide their students with dynamic, highly interactive remote training on the various practical and clinical aspects of critical care ultrasonography.

Moreover, this platform is very useful for assessing skills for both the image capture and interpretation phase.

Beyond its uses for training, Reacts enables real-time image and video transmission for clinical situations.

During an important academic training event, Reacts enabled the direct broadcast of clinical cases, including echocardiographic imaging, between American and European clinical professionals, thereby allowing them to perform case studies with active audience participation. Reacts provided unparalleled transatlantic communication between two expert groups, which resulted in a unique interactive experience for all participants.

Beyond Reacts’ utility as an excellent remote ultrasound training tool, it is also a flexible, user-friendly system with amazing potential for several other types of training and telehealth applications.

I will wholeheartedly use Reacts in my practice for a wide array of clinical and educational applications.”

Paul H. Mayo, MD
Professor of Medicine, Division of Pulmonary & Critical Care
North Shore-Long Island Jewish School of Medicine
New Hyde Park, New York, USA
"The tests done using the Reacts platform from Kuujjuaq gave very good results, despite limited satellite bandwidth in the northern Québec region.

Our need is to serve our six villages by overcoming the isolation of nurses and physicians. Reacts will enable us to increase the effective clinical range of stakeholders from Kuujjuaq’s Centre de Santé Tulattavik de l’Ungava toward isolated communities.

Reacts is a simple and effective tool that will enable us to meet ad hoc and growing clinical needs. The physicians stationed at Kuujjuaq believe that thanks to Reacts, they will be able to support each community’s LCSC nursing staff and help them make the clinical decisions they face every day.

As a result, we very much look forward to using this platform and are working with Dr. Beaulieu to deploy it in the northern Québec region.”

Raynald Robitaille T.P.
Technical Coordinator, Biomedical Engineering
PACS Coordinator
Centre de Santé Tulattavik de l’Ungava, Kuujjuaq

"The tests I’ve conducted from Switzerland with Dr. Beaulieu enabled me to discover Reacts’ full power and flexibility. The remote supervision and training of up-and-coming physicians is being taken to the next level. At intensive care, we can now see, all on a single screen, a patient’s digitalized medical file, the patient himself, his vital signs monitor, interaction with the on-site physician, and even, with the proper interface, an online ultrasound exam. Documents may be easily shown, shared, consulted simultaneously and annotated by one of more participants. When the given specialist isn’t on-site, he may obtain more specific information using a tablet or smartphone. We tested these remote consultations by requesting dermatological feedback. Image quality, combined with the live interaction enabled by Reacts, provided more positive comments than sending photos and making a phone call.

I very much look forward to implementing this software in our multi-site hospital, where it will be sure to become an invaluable tool.”

Dr. Damien Tagan
Physician-in-Chief, FMH Internal Medicine and Intensive Care
Hôpital Riviera-Chablais Vaud Valais, Switzerland
Many hospital centers or others organizations in Quebec and abroad are currently deploying pilot projects featuring Reacts in various disciplines to facilitate and optimize communication, training or supervision, depending on the projects’ specific objectives. Here are a few pilot projects that are either upcoming, in progress or completed:

- **Centre hospitalier de l’Université de Montréal (CHUM):** Experimental projects in clinical settings are currently in development.

- **McGill University Health Centre (MUHC):** Three pilot projects, namely intermediate cardiac surgery care / rehabilitation / technical support for hearing aid maintenance are underway.

- **2014 Montreal Grand Prix:** Reacts was used during the Montreal Grand Prix (June 2014) to establish a live link between the track hospital and the Sacré-Coeur hospital’s emergency ward. Through Reacts, Sacré-Coeur’s emergency physicians were able to view the care given to drivers in a live setting, track their vital signs and track the clinical state of patients brought to their own site by helicopter. This greatly optimized patient evaluation and care transfer when polytraumatized drivers arrived at emergency care.

- **Ultrasound session broadcast live between Belgium (Centre Hospitalier Erasme, Bruxelles) and Chicago (class at the American College of Chest Physicians):** During an ultrasound seminar given by the American College of Chest Physicians (ACCP) in May 2014, Reacts was used to present a live, transatlantic training session between the seminar’s attendants in Chicago and an intensive care specialist from the Belgian hospital center. The specialist performed various ultrasound exams live at the bedside of intubated patients in the intensive care ward. This 90-minute session enabled training on imaging and physiology.

- **Inter-university ultrasound certification (France):** Starting in fall 2014, Professor Antoine Vielilard Baron (Service de Réanimation, Hôpital Ambroise Paré, Boulogne, France) and his team will use Reacts to remotely teach and supervise echocardiography tests as part of France’s inter-university TUSAR (Techniques Ultrasoniques en Anesthésie et en Réanimation) certification. This certification and process will potentially be expanded to the rest of Europe.

- **Hôpital Riviera, Vevery, Switzerland:** Professor Damien Tagan, an intensivist and internist, has used Reacts since spring 2014 to remotely communicate with his intensive care unit. Other types of remote sessions were also conducted through Reacts in his hospital center, including dermatological consults.
Additional documentation

- Reacts installation guide (institution)
- Description of Reacts’ network infrastructure and security
- Website: www.iitreacts.com

For more information, please contact us at:
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