Canada's healthcare solutions magazine

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Wait time report card highlights work to be done

Report card season is here again. And with that, the Wait Time Alliance (WTA) has released its fifth annual report card on wait times in Canada.

The report card grades provinces on wait times in the initial five priority areas set by governments in 2004: joint replacement (hip and knee); sight restoration (cataract surgery); heart surgery (CABG); diagnostic imaging (MRI and CT) and cancer care (cancer radiotherapy).

Despite some improvement in wait time grades, long waits for care continue to be an issue and much of the wait time picture remains clouded in mystery. One difficulty in providing a true picture of the waits facing patients is that most current wait time reporting focuses only on the original five priority areas, a far cry from the hundreds of different types of care offered in physicians' offices, hospitals and other settings across the country.

Another issue is that most wait-time reporting measures the wait starting from a specialist physician's decision to treat a patient to the time the patient receives treatment. Because this is the portion of the wait for which data is publicly available, it is the focus of the 2010 WTA Report Card. However, it is only one portion of the total wait; patients can also face long waits from family physician/general practitioner referral to specialist consultation or multiple waits for several tests and procedures associated with a single care pathway.

This year, the WTA has raised the bar by using its own benchmarks to grade performance across additional areas of specialty care as well. The WTA found that wait time data for procedures outside of the five priority areas are a virtual "black hole" where information is scarce or non-existent. Grades outside the priority areas are dismally low, with an average grade of 'D,' or nearly half of all patients waiting longer than medically acceptable.

Despite being hailed as signs of progress, recent wait-time reports show how far we still have to go. Canadians deserve timely access to health care and accurate information on how long they can expect to wait for a consultation, test or procedure. Unfortunately, Canada is one of the few developed countries with universal health care systems where patients face long waits for necessary care.

Morena Zanotto
Editor

in this issue

Features

Departments

Digital signage system offers better communication with patients at Ohio hospital

When Fremont Memorial Hospital wanted to install a digital signage messaging display in its newly renovated lobby, it turned to John Raymond, vice president of Muzak of Toledo. The hospital's communications goals were to welcome visitors, promote services, announce meetings, publish bulletins and more.

A thorough search

As Raymond started researching different video messaging products, he happened to receive an e-mail from Black Box introducing its iCOMPEL digital signage solution. Impressed by what he saw, Raymond did more research into the system and contacted Black Box to make plans to see the system.

The demo

Once Raymond saw the iCOMPEL demonstration, he was convinced that it was the right system for Fremont. It offered a better price and a far broader feature set than any of the other systems he found on the market. The clincher was how easy it is to use. At that point, Raymond sent his recommendation for iCOMPEL to Hank Preston, network administrator at Fremont.

"It's so easy"

Once Preston saw iCOMPEL, he, too, was convinced that it was the answer. He wanted a video system with multiple zones and a network connection that could be controlled from a central location. iCOMPEL gave him that plus the ability to use live feeds and instant messaging.

During a short training session, Raymond and Preston set up four different layouts and got the system up and running.

"I'm very pleased with iCOMPEL," said Preston. "It does everything we wanted to do but couldn't before. It's working out really well. We're sending a constant feed to a 52-inch screen in the lobby."

"I didn't have a lot of digital signage experience and am happy with how far this system has come. The functionality has been fantastic and the basic operation to update content is very easy. It's so easy, I'm passing on the responsibility for the content to the marketing team."

Two is better than one

Preston was so impressed with the iCOMPEL system, he decided to order a second system for an information channel on the hospital's cable distribution system. The hospital already had a modulator and an available channel, but it never had a good way to implement it. iCOMPEL gave Preston an easy, affordable way to broadcast menus, bulletins and other information to patients and staff. To set up the cable channel, all Preston needed was a Black Box converter, which converted the iCOMPEL output to a Composite signal for the internal cable channel.

Black Box
Web link: baumpub.com/HC10192

The emergen image-guided

by Andinet Enquobahrie, PhD

Image-guided intervention research focuses on the development of innovative technologies that replace traditional surgery and invasive procedures with minimally invasive techniques that incorporate medical imaging to guide the intervention. Patients prefer these procedures to open surgeries because they typically cause less trauma to the body and result in faster recovery times. Technological advancements in medical imaging, registration algorithms, visualization technologies, and tracking systems are the driving forces behind increasing adoption of these procedures by physicians.

Software is an integral part of image-guided intervention systems. Whether it is for interfacing with a tracking device to collect position information from surgical instruments, registering intra-operative with pre-operative images, or generating a 3D visualization to provide visual feedback to the clinician, software plays a critical role. Historically, open source software has enjoyed great success in conventional low-risk applications. In recent years, open source software has made the transition into mission-critical applications, such as image-guided intervention systems.

Why open source reigns

Having an open platform in image-guided intervention systems increases the pace of research and discovery by promoting collaborations within and between clinicians, biomedical engineers, and software developers. One highly successful open-source system is the Image-Guided Surgery Toolkit (IGSTK)[1,2]. IGSTK is an open-source platform for developing image-guided therapy systems written in C++. It is free for commercial and non-

ce of open source software in interventions

commercial use. It has been adopted for liver lesion ablation, lung tumor biopsy, and other procedures. The toolkit is an ongoing, collaborative effort between Kitware, an open source research company in Clifton Park, NY, and Dr. Kevin Cleary, Director of the ISIS Laboratory at Georgetown University. IGSTK is the product of a series of STTR and R01 grants from the NIH that have spanned the past seven years. The toolkit is a powerful set of software components for rapid prototyping and developing image-guided surgery applications.

The development team has adopted lightweight software processes that emphasize safety and robustness while, at the same time, supporting geographically separated developers. These software processes are philosophically similar to agile software methods, with an emphasis on iterative, incremental, and test driven development principles. However, the guiding principle in the software processes and the software architecture of IGSTK is patient safety. For example, IGSTK uses a component-based architecture and state machine software design methodologies to improve the reliability and safety of the components. Furthermore, rigorous software registration testing processes are used to ensure the stability and interoperability of those components.

IGSTK-based applications

An IGSTK-based application which employs electromagnetic field (EM) technology to track biopsy needles is currently in a clinical trial at Georgetown University. IGSTK provides support for needle tracking using a variety of tracking options including EMF and optical cameras. In this EMF-based needle tracking application, the patient is positioned on the CT table, a CT image is acquired, and the location of the pathological tissue is identified on the images. During the biopsy procedure, a computer generated representation of the surgical scene is displayed for the physician and continuously updated with the current position and orientation of the biopsy needle based on measures from an EMF sensor attached to the needle. As part of an ongoing clinical trial at Georgetown, the usefulness of IGSTK for precision biopsy of suspicious lung lesions is being quantified. Other applications developed using IGSTK include radiofrequency ablation of liver tumors[3], robot-assisted needle placement[4], vertebroplasty[5], and integrated system for guidance of head and neck surgery[6].

The future

In the future, IGSTK will focus on three main challenging research areas in image-guided therapy, in cooperation with our many partners: 1) registration algorithms for intraoperative real-time feedback, 2) ultrasound focused therapy applications, and 3) image-guided drug delivery.

The challenges in developing registration algorithms for image-guided applications are related to tissue deformation and organ motion during minimally invasive procedures. Continued research focuses on fast and robust deformable registration algorithms that take advantage of the recent advances in computing technologies such as the graphics processors on video card (GPUs).

Ultrasound devices are receiving increased use in therapeutic applications. Focused ultrasound is currently being used to treat uterine fibroids, and to disrupt the blood-brain barrier in order to help cancer drugs reach their targets. Ultrasound-specific, quantitative workstations that interface with ultrasound devices and process ultrasound images during minimally invasive procedures will continue to be the focus of much research as these procedures become more common.

Image-guided drug delivery is the other hot research area. The objective of drug delivery is to increase the concentration of a therapeutic agent in the target tumor while limiting systemic exposure. Increasing the concentration of drugs in the tumor relative to normal tissues results in improved tumor control and reduced toxic side effects. Image guidance can be used in targeting the tumor and in releasing and monitoring the drug to improve the effectiveness of the procedure. In summary, open source software will continue to play a major role in tackling these types of new challenges and advancing the image-guided intervention field by promoting collaborations between clinicians, biomedical engineers, and software developers.

Kitware, Inc.

Web link: baumpub.com/HC10194

References

1. "IGSTK: An Open Source C++ Software Library, Second Edition", Cleary K, Cheng P, Enquobahrie A, Yaniv Z. Signature Book Printing, Gaithersburg, Maryland.

2. "The Image-Guided Surgery Toolkit IGSTK: An Open Source C++ Software Toolkit", A. Enquobahrie and P. Cheng and K. Gary and L. Ibanez and D. Gobbi and F. Lindseth and Z. Yaniv and S. Aylward and J. Jomier and K. Cleary, Journal of Digital Imaging, Vol. 20(Suppl. 1), pp. 21--33, 2007.

3. "Radiofrequency Ablation of Lung Tumors in Swine Assisted by a Navigation Device with Preprocedural Volumetric Planning", Filip Banovac, Patrick Cheng, Enrique Campos-Nanez, Bhaskar Kallakury, Teo Popa, Emmanuel Wilson, Hernan Abeledo, Kevin Cleary.Journal of vascular and interventional radiology, JVIR 1 January 2010 (volume 21 issue), pp.122-129.

4. "Robot Assisted Needle Placement: Developed Using Image Guided Surgery Toolkit (IGSTK)", P. Cheng, A. Enquobahrie, R. Stenzel, R. Lin, H. Zhang, Z. Yaniv, H. Kim, K. Cleary, Open Source Workshop MICCAI 2006.

5. "Accuracy Analysis of an Image-Guided System for Vertebroplasty therapy based on Electromagnetic Tracking of Instruments", J. Ding, N. Khan, P. Cheng, E. Wilson, V. Watson, K. Cleary, Z. Yaniv, SPIE Medical Imaging: Visualization, Image-Guided Procedures, and Display, 2008.

6. "High-Performance Intraoperative Cone-Beam CT on a Mobile C-Arm: An Integrated System for Guidance of Head and Neck Surgery", J. H. Siewerdsen, M. J. Daly, H. Chan, S. Nithiananthan, N. Hamming, K. K. Brock, and J. C. Irishe. Medical Imaging 2009: Visualization, Image-Guided Procedures, and Modeling, edited by Michael I. Miga, Kenneth H. Wong, Proc. of SPIE Vol. 7261.