Inland Imaging
Inside View
Trusted Medical Imaging

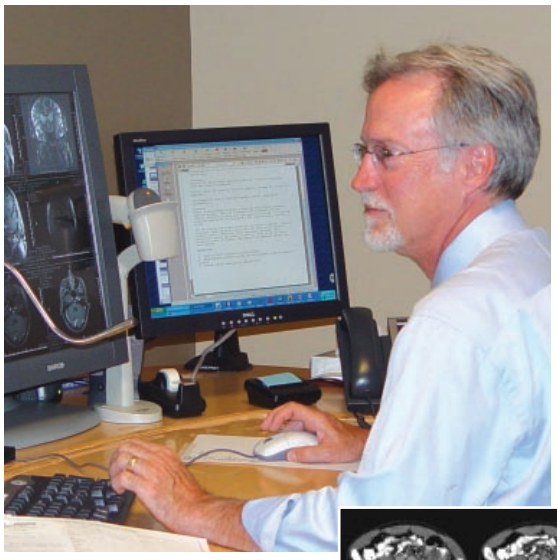
Voice Recognition Technology Improving Patient Care

SpeechQ's features designed to streamline reporting by automating common functions

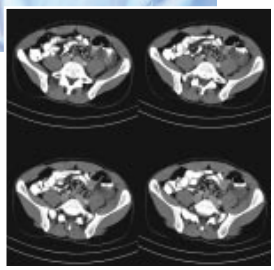
It is atypical in an outpatient imaging environment that a patient would present with pronounced chills, worsening left lower abdominal pain, nausea and vomiting, shallow breathing, low blood pressure and a fever of 103.3 degrees.

Unfortunately, that is what physicians and staff at The Polyclinic's outpatient imaging center were faced with on May 15, 2006, when symptoms a patient had been experiencing for three days suddenly began to worsen.

The patient's physician, Dr. Stacy Tribble, referred him that Monday to the center, where Spokane-based Inland Imaging interprets studies. Knowing a CT scan would shed significant light on the abdominal pain he'd been experiencing since Saturday night, she requested a STAT report, but no one could have guessed the severity of the situation.



Dr. William Keyes dictates a patient report using the hands-free technology of Inland Imaging's new voice recognition reporting system,



These images demonstrate focal inflammatory wall thickening, pericolonic fluid/phlegmon and extraluminal gas, as well as fluid attenuation in the left paracolic gutter; all indications of diverticulitis.

As he finished his CT study, the 43-year-old man with no history of health problems became gram negative septic from a diverticular abscess.

Day-to-day tasks for outpatient imaging physicians and staff consist of interpreting CT, MR and other imaging exams and returning a prompt result to the referring provider. In emergent situations such as this, it becomes exceedingly important that these exams are interpreted quickly and the results communicated efficiently. Now, thanks to a new voice recognition technology recently purchased by Inland Imaging, MedQuist SpeechQ, report turnaround is even more expedient.

SpeechQ's features are designed to streamline reporting by automating common functions. Inland Imaging radiologists can now dictate, review and electronically sign a report in a single session—functions that previously were completed in three phases at different times.

In this case, SpeechQ allowed for the diagnostic imaging report to be handed directly to the paramedics upon their arrival–only a few minutes after the patient was removed report and medics were given a CD

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Features
Summer 2006

28,500
number of MRI studies performed at Inland Imaging in Spokane in 2005

42,300
number of MRI studies interpreted by Inland Imaging radiologists in 2005

Inland Imaging LLC
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Profiles

Julie Kaczmark, MD
Pediatric Imaging

Dr. Kaczmark recently completed her pediatric imaging fellowship at Children's Medical Center in Dallas, Texas.

She obtained her medical degree at St. Louis University in Missouri and completed her internship at Forest Park Hospital in St. Louis. She finished her radiology residency at Baylor University Medical Center in Dallas.

Dr. Kaczmark and her husband, Jim, enjoy numerous outdoor activities and especially love visiting national parks. In her spare time, she likes to play the piano, sing, read, sew and enjoys doing volunteer work.

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Steven Sohn, MD
Neuroradiology, Musculoskeletal Imaging

Dr. Sohn specializes in neuroradiology and musculoskeletal imaging.

He earned his medical degree from the University of Washington. He also has a master's degree in medical management from the University of Southern California in Los Angeles. His neuroradiology fellowship was completed at Stanford University and his musculoskeletal imaging fellowship at the University of Southern California.

Dr. Sohn enjoys tennis, golf, baseball and spending time with his family.

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Medical School: University of Washington, Seattle
Residency: University of Florida, Gainesville
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Gregory Sterne, MD
Body Imaging & Musculoskeletal Imaging

Dr. Sterne was fellowship-trained in body and musculoskeletal imaging at the University of Washington, where he also received his medical degree. His radiology residency was completed at Virginia Mason Medical Center in Seattle. He also has a master's degree in physical therapy from Baylor University.

Dr. Sterne's interests include bicycling and running. He and his wife have an infant daughter.

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All Inland Imaging physicians are board-certified by the American College of Radiology

SpeechQ

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from the scanning table. Dr. Tasneem Lalani, the Inland Imaging radiologist responsible for interpreting the CT results, quickly completed the of images and a finalized report to take with them to the emergency room.

The report was of great value in treating the patient's diverticulitis. At present, CT of the abdomen and pelvis with IV contrast is the diagnostic procedure of choice for assessing acute diverticulitis. A subsequent CT on June 7 showed significant improvement of the patient's colonic wall thickening.

Inland Imaging's full implementation of SpeechQ is scheduled to occur over the next six months. The first group of radiologists to utilize this voice recognition technology has witnessed an 81 percent reduction in turnaround times.

Radiologist, Dr. William Keyes, had this to say about the technology, "It was a simple choice; SpeechQ offered our radiologists increased productivity, turnaround time| improvements, cost reduction and more accurate reports. All of these combine to ultimately benefit our referring providers and patients."

SpeechQ was ranked #1 in speech recognition by a recent KLAS report. KLAS is an independent research and consulting firm specializing in monitoring and reporting the performance of healthcare information technology vendors.

Open MRI Upgrade Complete

Design of special advantage when imaging larger patients

Inland Imaging recently completed an upgrade to our low-field, open MRI system. Although the MRI technology that Inland Imaging predominately utilizes is high-field, our open MRI unit, located at 525 South Cowley, offers many advantages that our high-field units cannot.

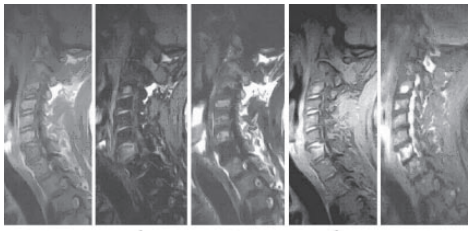
Low-field MRI is designed to be open on the front, back and sides. This design allows access to the patient during the examination. This is also of special advantage when conducting MRI on the larger patient.

Prior to our recent upgrade, our low-field system could not produce the high quality images needed for our orthopedic patients. With the purchase of additional software and coils, Inland Imaging now has an option for larger patients that require imaging of their bones, muscles, joints and spines.

"This upgrade ultimately provides the highest level of diagnostic confidence while patients are afforded the greatest level of comfort and reassurance," says Inland Imaging musculoskeletal radiologist, Michael Kirsch, MD.

It is important to note that although open MRI technology works in the same way as conventional high-field MRI, open MRI systems have a lower magnetic field strength. This can result in longer scan times and images with overall lower resolution than those obtained from conventional MRI units. Open MRI can also minimize claustrophobic effect, but sedation may still be needed for some patients for further comfort during the exam.

For more information about Inland Imaging's open MRI technology, please contact ***customer service representative, Jeanette Jolley, at 509.363.7730 or email jjolley@inland-imaging.com***



Inland Imaging now has an option for large or claustrophobic patients who require imaging of their spines.

Low-field MRI is designed to be open on the front, back and sides. This is of special advantage ***when performing MRI on the larger patient.***

Correlation Shown Between Carotid Stenting and Cognitive Function

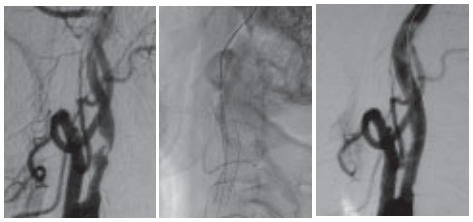
Study shows improvement in brain function after carotid artery stenting treatment

A new study, authored by Inland Imaging interventional radiologist, Rod Raabe, MD, indicates that patients with narrowed carotid arteries could benefit from being treated not only to prevent stroke, but also to improve cognitive brain function. Patients classified as asymptomatic and symptomatic both had statistically significant improvement in brain function after being treated with carotid artery stenting.

"We know from previous studies that carotid stenting can prevent a stroke in patients that are at high risk, but what we didn't know is that the treatment makes people's brains function better," says Dr. Raabe.

Currently, asymptomatic patients that are categorized as non-high risk for surgery are treated with surgical carotid endarterectomy and not stenting. Symptomatic patients, those who have already experienced stroke or transient ischemic attacks, are also treated to prevent future stroke if their narrowing is greater than 50-70 percent.

In spite of being classified as asymptomatic, the study shows a significant decline in brain function for these patients, especially in the more advanced brain functions. Executive functions and complex memory are the first to suffer from the effects of a clogged carotid artery. Patients in the study classified as asymptomatic and with greater than 90 percent stenosis demonstrated the most improvement in neurocognitive function, most likely because there was no previous injury to the brain. The study also shows improvement in brain function for symptomatic patients, but asymptomatic patients are witnessing the most dramatic results.



***L to R**: Stroke pre-stenting; stroke stent placement; stroke post-stenting.*

Images courtesy Phillippe Gailloud, MD, Johns Hopkins Hospital

The study involves the most comprehensive measurement of pre- and post-neurocognitive effects in any carotid stenting study to date. It examines neurocognitive measures including IQ, handling of spatial relationships, memory

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Magnetic Resonance Cholangiopancreatography (MRCP)

Technique of Choice in Assessing Biliary or Pancreatic Diseases

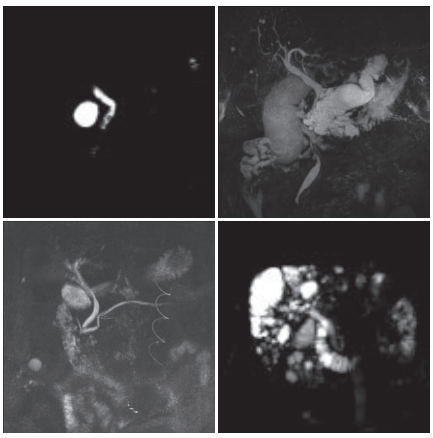
Ultrasound is the first line modality for evaluating suspected biliary or pancreatic disease and does well for most patients. However, in cases where there is obstruction and the distal CBD or pancreatic duct cannot be visualized, further evaluation may be necessary with magnetic resonance cholangiopancreatography (MRCP) or endoscopic retrograde cholangiopancreatography (ERCP).

MRCP is an emerging noninvasive technology that is widely becoming accepted as the technique of choice for assessing biliary or pancreatic diseases. MRCP utilizes MR imaging to visualize static fluid, such as bile,making fluid in the ducts appear bright against the darker tissue. Image post-processing is used to make multi-dimensional images of the entire biliary tree and the pancreatic ducts.

ERCP is quickly being replaced by MRCP as ERCP is invasive and operator-dependent. ERCP is also associated with complications and limitations including lack of ability to cannulate the CBD due to prior enteric diversion or Billroth surgery. The quoted failure rate of ERCP is between 3-10 percent[1].

In a study performed by the department of gastroenterology at St. Vincent's Hospital in Melbourne, 146 patients underwent 149 ERCP/MRCP procedures, of which 129 were evaluable with successful MRCP and ERCP[2]. Diagnoses included choledocholithiasis in 46 and biliary stricture in 12 patients. The sensitivity, specificity, and positive and negative predictive values for MRCP in the diagnosis of choledocholithiasis were 97.9 percent, 89.0 percent, 83.6 percent and 98.6 percent, respectively. All 12 strictures were diagnosed by MRCP (sensitivity 100 percent, specificity 99.1 percent).

Another study cites the sensitivity of MRCP in detailing the biliary tract between 81-100 percent and a specificity of 92-100 percent in detecting choledocholithiasis[3].



***Clockwise L to R**: CBD Stones; Distal Pancreatic Ductal Stricture; Low Cystic Duct Insertion; Patient with polycystic liver disease and normal bile ducts*

MRCP is safer because it does not require anesthesia or injection of intraductal or intravenous contrast agents. Additionally, since there is no contrast medium to distend the ducts, the subsequent images showcase ducts in their natural state.

Another drawback of ERCP is that it cannot evaluate extraductal structures. MRCP can be combined with MR imaging to evaluate for extraductal disease and to stage tumors such as pancreatic cancer and cholangiocarcinoma.

MRCP is also a useful option in evaluating those patients with failed or inadequate ERCP, helping gastroenterologists to avoid using invasive procedures in the diagnosis of bile duct disease[1]. While ERCP can be therapeutic as well as diagnostic, MRCP can be used as a roadmap for these interventions and can allow for selection of candidates who would benefit most from an invasive procedure[4].

Preparation for this procedure includes fasting 2-4 hours prior to the examination in order to reduce the fluid in the gastric antrum and the duodenum, which may overlie the ducts. The MRCP examination takes 30-40 minutes.

For more information about MRCP or other body imaging procedures performed by Inland Imaging, please ***contact Dr. Tasneem Lalani, tlalani@inland-imaging.com.***

Indications

Biliary Disease

- **Cystic disease of bile duct (choledochal cyst, choledochocele, Caroli's disease)**
- **Congenital variants (low or medial duct insertion, aberrant right hepatic duct)**
- **Choledocholithiasis**
- **Primary sclerosing cholangitis**
- **Post-surgical biliary complications**
- **Cholangiocarcinoma**

Pancreatic Disease

- **Pancreas divisum**
- **Chronic pancreatitis**
- **Pancreatic mass characterization and staging**

(1) Varghese, JC, Farrell, MA, Courtney, G, Osborne, H, Murray, FE, Lee, MJ. (1999) Role of MR cholangiopancreatography in patients with failed or inadequate ERCP. AJR AM J Roentgenol 173(6): 1527-33

(2) Taylor, A, Little, A, Hennessy, O, Banting, S, Smith, P, Desmond, P. (2002) Prospective assessment of magnetic resonance cholangiopancreatography for noninvasive imaging of the biliary tree. Gastrointest Endosc. 55(1): 17-22

(3) Freitas, M, Bell, R, Duffy, A. (2006) Choledocholithiasis: Evolving standards for diagnosis and management. World J Gastroenterol 12(20): 3162-3167

(4) Macdonald, G, Peduto, A. (2000) Magnetic resonance imaging and diseases of the liver and biliary tract. Part 2. Magnetic resonance cholangiography and angiography and conclusions. J Gastoenterol Hepatol 15: 992-999

Carotid Stenting

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and other executive functions. Prior to the procedure, patients' memories and executive functions are tested five times and an additional four times after. Response to commands, word and number memory, and putting things in order are also assessed. Improvement in these functions is statistically significant, even in patients with a lower degree of stenosis. The study is ongoing, but these preliminary results in 26 patients evaluated six months after the procedure are proving promising.

For more information about carotid stenting or other interventional radiology procedures performed by Inland Imaging, please ***contact Dr. Raabe directly at rraabe@inland-imaging.com.*** *Information provided by the Society of Interventional Radiology, www.SIRweb.org.*