Quality Initiatives and Surgical Robot Advance Patient Care

A2 Improving Regional Response to STEMI
Eleven hospitals collaborate to speed time to treatment

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New da Vinci® Si system is being used for select surgeries

A6 Optimizing Patient Flow and Clinical Capacity
Insulin therapy advances, adherence to ADA treatment plans, help patients

A7 Become a Diabetes Expert
Soaring rates of obesity, diabetes call for all physicians to partner in disease management
Northern Michigan Providers Work Together to Save Lives

Kim Moser doesn’t look like anyone’s idea of a massive heart attack victim. But at 39, this active mom and wife found herself in a sudden and desperate fight for her life.

Her arm ached, the tops of her hands were sweaty, and she felt like she wanted out of her skin.

“I walked in the doors of Kalkaska Memorial Health Center’s (KMHC) Emergency Department (ED) and said, ‘I don’t know what’s wrong with me, but I need help.’”

Help is exactly what she got. Everyone on duty that day – KMHC’s ED team, Kalkaska’s Emergency Medical Technicians, and the heart team at Munson Medical Center (MMC) – worked in concert to save her life.

Moser is among the estimated 450 men and women annually in northern lower Michigan who have a massive heart attack caused by a blocked artery. Known as a STEMI (ST-elevated myocardial infarction), this kind of heart attack carries a substantial risk of death if not identified and treated quickly – ideally in less than 90 minutes.

Last summer, CEOs from 11 hospitals in northern Michigan pledged support for a regional system of STEMI care. One month later, nearly 100 physicians, nurses, and Emergency Medical Service (EMS) providers representing the entire region met to determine how to best coordinate and deliver that care.

Getting patients to one of the two facilities in northern lower Michigan where a blocked artery can be opened is complicated. The region’s population of 500,000 is spread across 11,177 square miles. Because the geography is vast and travel can be hindered by weather, part of the focus has been on pre-hospital care.

All Advanced Life Support units now have a 12-lead EKG on board to help identify patients having a STEMI.

Both Munson Medical Center and Northern Michigan Regional Hospital in Petoskey recently purchased a system that allows EKGs to be transmitted from the field to their EDs, so ER physicians and cardiologists can see exactly what is going on well before the patient arrives. If an artery needs to be opened, the catheterization team can be activated while the patient is still en route to the hospital, saving precious time.

If a patient cannot be quickly transported to a center that can open an artery through angioplasty or stenting, thrombolytics should be given to partially relieve the blockage. By the end of 2009, 100 percent of patients in that situation received thrombolytics within 20 minutes of arriving at an emergency room.

“This ongoing effort has made great strides in the brief time it has been in place,” said James Fox, MD, FACC, Chair, Department of Cardiology and Director of the STEMI program at MMC. “We need to continue to extend the benefits of this type of care to all patients in northern Michigan – wherever they live.”

“The STEMI Initiative is going really well,” said Diane Barton, BS, RN, Regional STEMI Nurse Coordinator at Munson Medical Center. “We knew it would be a four to five year project when we started. To get as much accomplished as we have in the first year is pretty amazing. Everyone is still very energized about it.”
### STEMI Timeline Goals

<table>
<thead>
<tr>
<th>Patient Onset of STEMI Symptoms</th>
<th>EMS Dispatch</th>
<th>EMS Transport</th>
<th>Hospital (Patient Self Transfer)</th>
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</thead>
<tbody>
<tr>
<td>Call 911</td>
<td></td>
<td>EMS Triage Plan: PCI Capable Hospital</td>
<td>PCI: Door-to-Balloon ≤ 90 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EMS-to-Balloon ≤ 90 minutes</td>
<td>Non-PCI: Door-to-Needle ≤ 30 minutes</td>
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<tr>
<td></td>
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<td>Non-PCI Capable Hospital (Fibrinolysis)</td>
<td>EMS-to-Needle ≤ 30 minutes</td>
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<td></td>
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<td>Golden Hour = first</td>
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<td></td>
<td></td>
<td>5 minutes</td>
<td>60 minutes</td>
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<td></td>
<td></td>
<td>8 minutes</td>
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### Strategy

<table>
<thead>
<tr>
<th>Strategy</th>
<th>% of Hospitals</th>
<th>Minutes Saved</th>
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</thead>
<tbody>
<tr>
<td>ED physician activates the Cath Lab</td>
<td>23</td>
<td>8.2</td>
</tr>
<tr>
<td>Single call to the operator</td>
<td>14</td>
<td>13.8</td>
</tr>
<tr>
<td>Pre-hospital EKG</td>
<td>9</td>
<td>15.4</td>
</tr>
<tr>
<td>Cath Lab team expected within 20-30 mins.</td>
<td>13</td>
<td>19.3</td>
</tr>
<tr>
<td>Real time data feedback to ED, Cath Lab</td>
<td>42</td>
<td>8.6</td>
</tr>
<tr>
<td>Attending cardiologist always in hospital</td>
<td>4</td>
<td>14.6</td>
</tr>
</tbody>
</table>

Bradley et al, NEJM, 2006

### Answering the Question ‘How’d We Do?’

A feedback report is now sent to all medical personnel involved in a STEMI case, including all EMS providers and staff at all facilities. The report details how long it took for the patient to receive treatment, and exactly what was done. “Before” and “after” pictures of the blocked vessel are included so each person can see the impact of their actions. If the patient did not receive care within the required time parameters, follow-up is done to determine why.

### Fluid Patient Care

“The goal of the multidisciplinary team is to push the care of the patient forward,” Barton said. “Instead of saying ‘this is what EMS does, this is what the ED does, this is what the cath lab does,’ we’re trying to make it more fluid for the patient by breaking down the barriers. We’re now asking EMS personnel to stay with the patient in the cath lab if they can so they see what happens next.”

That step alone led to a process change that saves additional time. EMS personnel observed that the defibrillator pads they placed on the patient in the field had to be taken off and repositioned in the cath lab to allow for the interventional procedure – a step that not only took time, but increased the patient’s discomfort. “EMS determined they could change the way they put the pads on in the field so it doesn’t have to be redone in the cath lab,” Barton said.

### Coordinated Care

One year after her near-fatal heart attack, Kim Moser can attest to the importance of coordinated emergency care. When she went to the Kalkaska ED, physician Andrew Long, MD, quickly consulted with Munson cardiologist Brian Jaffe, MD. “There was a lot of really thorough communication and it moved very swiftly,” Moser said.

“The cooperative effort between Kalkaska and Munson was smooth and fluid,” Moser said. “I almost died, and it was because of the care I received in Kalkaska and the cooperation with Munson that I’m alive today.”
The da Vinci® robotic surgical system, installed at Munson Medical Center (MMC) in June 2009, is providing a new standard of care for hysterectomies and prostate cancer surgery.

The da Vinci system is now used in 95 percent of prostatectomies and 20 percent of hysterectomies in Michigan. Of the 39 da Vinci systems in Michigan, none were located north of Midland until Munson purchased the da Vinci Si, the most advanced robotic system available.

“Our patients had been asking for this less invasive, highly publicized technology and had often scheduled procedures downstate because we have not had it available,” said MMC Urology Section Chief Jay Starr, MD.

“We responded to our community and now have the absolute latest in robotic technology, superior to older versions of da Vinci found downstate.”

The da Vinci system is particularly important in complex cases that may not be good candidates for open surgery. Patients with contraindications for traditional laparoscopic procedures can now have a minimally invasive procedure performed close to home.

Improved Dexterity and Image

Surgeons view a high-resolution 3D color image of the surgical site while seated at a console a few feet from the patient. The image and surgeon movement is relayed as actual, versus the mirror movements of traditional laparoscopic procedures.

As the surgeon manipulates controls, robotic and computer technologies translate hand, wrist, and finger movements into precise micro-movements of miniaturized instruments on interactive robotic arms on a patient-side cart. Every surgical maneuver is performed with direct input from the surgeon.

Patients diagnosed with prostate cancer should ask their physician about all their treatment options, Starr said. Surgery using da Vinci may not be appropriate for certain cases, and that decision is best made by the patient and physician together.

For more information on da Vinci and referrals to participating surgeons, go to mymunson.org/physicians.
Starr said the latest da Vinci offers two key advantages when performing prostatectomies: superior visual control and more advanced surgical maneuvers than previous robotic procedures. “It is quicker to dock, I can see what I’m doing so much better, and it is more precise.”

Robotic-assisted surgery allows the surgeon enhanced magnification, a three-dimensional view, as well as improved dexterity and maneuverability using EndoWrist® instruments that move like a human wrist.

da Vinci prostatectomy can further enable:
- Visualization of tissue planes, target anatomy, and the neurovascular bundles
- Dissection of the prostate and surrounding structures
- Suturing the DVC and urethrovesical anastomosis
- Traction and counter-traction of the prostate, bladder, and adjacent anatomy

Starr said da Vinci also enables surgeons to perform other procedures, including lymph node dissection, in a minimally invasive manner.

di Vinci Prostatectomy

di Vinci Hysterectomy

“Robotic surgery allows the surgeon to treat a greater range of conditions in a wider range of patients,” said Kurt Wright, MD, OB/GYN. “The three-dimensional views offer greater visualization than traditional two-dimensional laparoscopy.”

Robotic-assisted surgery offers a minimally invasive approach for benign gynecologic conditions and certain gynecologic cancers. It enables gynecologists to treat complex pathology in a minimally invasive way, minimizing conversions.

Advantages include:
- Minimally invasive treatment of early stage gynecologic cancer
- Access, precision, and control for dissections — with low estimated blood loss
- A minimally invasive approach for myomectomy (removal of uterine fibroids)
- Control of the camera and all three operative arms for surgical autonomy and efficiency

Kurt Wright, MD, OB/GYN, performed hysterectomies with da Vinci while on the medical staff at St. Joseph in Ann Arbor.

Urethrovesical Anastomosis

Increased dexterity provided by using the EndoWrist® Needle Drivers allows for precise needle placement and suturing required to perform a watertight urethrovesical anastomosis.

Vaginal Cuff Closure

EndoWrist® instrument articulation provides surgeons with greater dexterity, precision, and control to suture the vaginal cuff closed compared to conventional laparoscopy.
Munson Medical Center (MMC) launched an Inpatient Throughput Initiative in January 2009 to optimize patient flow. As a regional referral center and Level II Trauma Center, MMC has seen its inpatient volume climb during the past decade, creating a constant need to address general capacity and bed availability at the 391-bed facility.

Improving throughput was one of the top recommendations from Munson Medical Center’s Fifth Medical Advisory Panel (MAP) that convened last fall. MAP includes 10 physicians who prioritized needs at the medical center based on input from all medical sections and departments.

MAP recommendations have been incorporated into the hospital’s driving strategies and support Munson’s strategic vision to deliver the best combination of high quality, efficient, and accessible health care.

Munson’s broad, multidisciplinary Throughput Initiative is modeled after an Institute for Healthcare Improvement (IHI) collaboration on best practices of hospital-wide patient flow. IHI’s program offers perspectives on impediments to timely and efficient flow of patients through acute care settings, including areas that tend to produce bottlenecks, such as the Emergency Department and operating rooms (OR).

“Our overall goals are to accept transfers on a timely basis, reduce the number of boarders waiting for inpatient beds, and improve overall patient care quality and service,” said Kathleen McManus, Executive Vice President and Chief Operating Officer at Munson Medical Center. “We expect this initiative to take two to three years to fully implement. This is totally changing the way we think about and how we deliver care in our facility.”

Efficient flow of patients through acute care settings will maximize bed use and allow for timely transfers.

“No one is happy when you can’t find a bed. This initiative will also support our patient safety efforts by allowing patients to be placed on the most appropriate clinical unit in a timely manner.”

Facility Projects Address Capacity Needs
Expanding clinical capacity is also being addressed at MMC through facility and technology improvements. Projects include the January 2009 opening of expanded cardiac catheterization labs with 24 recovery beds, and a new 29-bed stroke and vascular patient care unit that opened in January 2010.

OR capacity has increased from 13 to 16, including an endovascular and open vascular OR with digital imaging. Throughput was a major consideration during the design phase, as well as patient, physician, and staff satisfaction. The project creates two separate OR suites that will benefit scheduling of patients.
As Diabetes Rates Soar, Efforts to Educate Patients, Providers Continue

A community survey by Northern Michigan Diabetes Initiative (NMDI) in 2007 found that 13.4 percent of adults in northwest lower Michigan have been diagnosed with diabetes, compared to 9 percent in the state of Michigan.

With the number of Americans with diabetes expected to double by 2050, Steven Lamie, MD, Medical Director of NMDI, said he constantly stresses the need for medical practitioners to study the disease.

“I gave a talk to residents and I told them, ‘You’ve got to be an expert in diabetes,’” he said. “There are so many people who have it and so many people who are going to have it – the numbers are scary.”

Three Steps to Managing Diabetes

Primary care physicians should take three steps to manage diabetes cases in their practice, Lamie said:

- Schedule regular, routine follow-up visits specifically for diabetes
- Maintain a patient registry
- Follow standard of care guidelines such as the American Diabetes Association’s (ADA) recommendations regarding blood pressure, cholesterol levels, and medications
- The ADA recommends three preventive procedures – an annual eye exam, an annual foot exam, and two to four A1C tests each year. In an NMDI survey, only 44 percent of patients with diabetes had received all three recommended preventive procedures in the past year.

NMDI continues, with ambitious goals of sharing diabetes data for performance measurement, engaging consumers, promoting early detection of pre-diabetes, preventing Type II diabetes, and improving health care delivery around diabetes.

Diane Butler, Manager of Community Health and NMDI, acknowledged the group has its work cut out for it. “We have a lot of challenges, doing more with less resources,” Butler said. “We’re working on pulling together the right mix of people to keep moving forward. The prevalence and the risks for diabetes continue to go up.”

More than one third (36.9 percent) of Michigan adults between 55 and 64 are obese, according to the Michigan Behavioral Risk Factor Survey, and therefore at high risk for developing diabetes due to their age and weight.

Additional Diabetes Resources

nmddiabetes.org Links to online resources are available via the Northern Michigan Diabetes Initiative web site, including a page dedicated specifically to health care providers, with a discussion board hosted by Jill Vollbrecht, MD, a Traverse City endocrinologist and frequent speaker on diabetes management.

dpacmi.org The Michigan Department of Community Health’s Diabetes Prevention and Control Program recently established a Diabetes Partners in Action Coalition to provide statewide leadership in the prevention and control of diabetes in Michigan. The coalition’s web site lists resources for physicians and people with diabetes and pre-diabetes.

diabetes.org Diabetes information is available through the American Diabetes Association web site and at 1-800-342-2382.

For additional resources, contact Butler at (231) 935-9256 or dbutler@mhc.net.