A New Treatment for Severe Frostbite

By Karen Testa, RN, BSN, CCM

A recent study released by the Society of Interventional Radiology’s 33rd Annual Scientific Meeting reported a breakthrough treatment that can save limbs severely affected by frostbite: using specialized imaging to visualize arteries lacking blood flow, then threading catheters into the arteries to deliver thrombolytic (anti-clotting) and antispasmodic drugs to dissolve blood clots and relax the arteries. Severe frostbite can block blood flow and cause small clots to form in the affected arteries. According to the researchers, this technique reopens recently frozen, clotted arteries and restores blood flow to tissues, which can help tissues heal and save limbs.1

Interventional radiologists are physicians who specialize in minimally invasive, targeted treatments performed by using image guidance. They use angiography and MRI as a road map allowing them to guide needles or catheters through the body, generally into an artery, for diagnosis and/or treatment of the affected area. In a small prospective trial, interventional radiologists used angiography to confirm loss of blood flow in patients with severely frostbitten hands or toes, then directly delivered drugs via intra-arterial catheters to these areas. Six frostbite patients, ages 18 to 65 years who received Tenectaplastase (a recombinant tissue plasminogen and thrombolytic drug) were compared with 11 patients who had received Retaplastase (a generic thrombolytic drug). The trial was designed to determine if the use of Tenectaplastase would show improved results because of its greater plasma stability. The patients had severely frostbitten hands and feet, with tissue frozen to the bone and deep muscle, as well as tendon, nerve and blood vessel damage, which typically leads to gangrene and loss of limbs. Patients were followed for six weeks to assess outcomes.1
This study was conducted by Dr. George Edmondson, an interventional radiologist with St. Paul Radiology in St Paul, Minn., and others. According to Dr. Edmonson, improvement was noted within one to three days of treatment. One half of the patients that received Tenectaplastase, however, saved all of the affected limbs, which would have been otherwise lost. With both groups, approximately 80 percent of the patients’ affected limbs responded with significant improvement. Additionally, Dr. Edmondson treated six patients outside this protocol; five out of six of the patients had complete responses, one had no response. A seventeen year retrospective review of this study is planned, according to Dr. Edmonson, and discussion has been initiated regarding a venous versus intra-arterial trial.

Additional research supports the use of anti-clotting agents and successful outcomes for treatment of severe frostbite patients. According to a report in the June, 2007 issue of Archives of Surgery, researchers using the tissue plasminogen activator (tPA) dramatically reduced the risk of amputation following severe frostbite. tPA is a systemic enzyme made by the cells lining the blood vessels and has also been made in the laboratory. It is a thrombolytic agent used in the treatment of heart attack and stroke. A single-center, retrospective review featured 32 patients with severe frostbite who were treated with tPA in addition to standard treatment (rewarming, rehydrating and cleaning wounded areas) within 24 hours of injury, treatment with intra-arterial tPA may beneficial. This assumes that the patient is willing to accept a small risk of potentially catastrophic bleeding in return for a greater likelihood of retaining functional limbs.

Dr. Edmonson noted that he has used tPA in the past to treat frostbite patients but the patients experienced bleeding and other complications. Prior to that, Urokinase (urokinase-type plasminogen activator-uPA) was used for many years in his practice.

He noted further that thrombolysis will continue to be used for frostbite in his practice but they are trying to better determine in advance which patients will not benefit, to avoid unnecessary treatment.

About Frostbite
Frostbite results from the freezing of tissue with exposure to extreme cold (at or below zero degrees Centigrade or 32 degrees Fahrenheit) for a prolonged period. In these extreme cold temperatures, blood vessels start to narrow reducing blood flow to the exposed areas. This can result in damage to the blood vessels and severe injury to the tissues. If frostbite is not treated immediately, the damage may become permanent resulting in damage to muscles, tendons, bone and nerves. With non-functioning tissue, gangrene can follow, possibly requiring amputation of the affected area. Areas most frequently affected by frostbite are body parts farthest from the heart, including the ears, nose, cheeks, chin, fingers, and toes.

Historically, frostbite was a condition mostly affecting soldiers and outdoorsmen. Currently it is most frequently encountered in the homeless, mountaineers and other winter outdoor sports enthusiasts, cold weather rescuers, soldiers, and individuals that work or are stranded in the cold (car accidents or breakdowns). There is no formal reporting system for the incidence of frostbite. Most people who get frostbite are males aged 30 to 49 years. Other risk factors include previous cold injury, smoking, underlying illness such as peripheral vascular disease and diabetes, and altered mental status (e.g., alcohol use, mental illness, exhaustion), limiting the individual’s ability to respond to cold.
The standard treatment for frostbite hasn’t changed for decades. Treatment includes rapid rewarming (immersing the affected area in a waterbath heated to 40-42 degrees centigrade) and elevation of the affected areas to enhance tissue viability, daily hydrotherapy to improve range of motion, and preventing complications and infection (e.g., splinting and aseptic wound care). Tissue damage may be worsened though if frostbitten tissue is rewarmed when there is a possibility of refreezing before reaching adequate medical care. After thawing and re-warming the affected area, inflammation can stimulate clotting that blocks small vessels of the limbs. Injured arteries can spasm, which may further impede blood flow to these small vessels.

Hyperbaric oxygen therapy has also been used to improve revascularization and tissue healing by preventing hypoxia and reducing edema surrounding necrotic tissue. However, the current medical literature is limited to case reports, few actual research studies show the effectiveness.

Researchers agree that additional studies are needed to confirm outcomes and determine the best methods of assessing damage to tissues, and administering anti-clotting drugs to severe frostbite patients. Interventional radiologists report that they will continue this research to improve and modify protocols.

Sources:
3. Definition of Tissue plasminogen activator (tPA); MedicineNet.com, 2008; pg 1.
5. “Frostbite”; Wikipedia; August 18, 2008; pg 1.

Karen Testa, Senior Perinatal Nurse Consultant, has been with ING Reinsurance for eight years. She has worked in the area of case management more than nine years, and has over 28 years of experience working with high risk pregnant women in hospital, clinic and home care settings.
No Easy Answers in Resuscitating Extremely Premature Infants

By Dr. Jeanne Mrozek

CASE #1
BABY GIRL A: This girl was born at 24 weeks gestation with a birth weight of 545 grams. She received antenatal steroids, two doses of surfactant, and six days of high frequency oscillation for pulmonary interstitial emphysema. She developed necrotizing enterocolitis with a bowel perforation and required ileostomy. She developed cholestatis due to prolonged TPN exposure and bowel rest. She had Grade IV/V retinopathy of prematurity with a retinal detachment. She had no intraventricular hemorrhage.

At 24 months of age she was developmentally at 18 months. Although she is blind in one eye she has some light/dark vision. She has sensory issues, poor weight gain, and her occipitofrontal circumference (OFC) is less than the third percentile. She is verbal and ambulates.

CASE #2
BABY BOY B: This infant was born at 24 weeks gestation with a birth weight of 650 grams. He received surfactant, but no antenatal steroids. He was on a ventilator for 46 days and had a pneumothorax that was treated with a chest tube. He had surgery for retinopathy of prematurity and is blind in one eye.

Throughout early childhood he had delays in class and needed extra help. By the fourth grade, he had advanced to the level of his peers. He graduated from high school with a 3.3 GPA and now attends college where he is majoring in history and education.

Historically, decisions regarding whether to administer intensive care to extremely premature infants were based on gestational age alone. In 1963, Patrick Bouvier Kennedy was born at 34 5/7 weeks’ gestation with a birth weight of 2100 grams. He died despite aggressive efforts to save his life. With strides made in intensive care and technology, survival statistics for premature babies sky-rocketed during the decade from 1970 to 1980. Most people expected this trend to continue. Statistics from the 1980s, however, showed no further significant improvement in survival of babies with less than 25 weeks gestation or birth weights under 750 grams. During the 1990s, further improvements in survival were noted for younger and smaller babies. This was felt to be secondary to the use of surfactant and improved ventilator technology. With this lowering limit of the concept of viability came further ethical, financial, and social questions. No longer was the question “can the baby survive?” but rather, “how is this baby going to do?”

A recent article in the New England Journal of Medicine looked at factors involved in the outcomes of extremely premature infants who received intensive care. The study followed 4,446 infants born at 22 to 25 weeks’ gestation (determined on the basis of best obstetrical estimate) in the Neonatal Research Network of the National Institute of Child Health and Human Development. Researchers related risk factors assessable at or before birth to the likelihood of survival, survival without profound neuro-developmental impairment, and survival without neuro-developmental impairment at a corrected age of 18 to 22 months. Of the infants followed, 83 percent received intensive care in the form of mechanical ventilation. Outcomes were determined in 4,192 infants (94 percent of the possible total).
Among those assessed at 18-22 months, 49 percent died, 61 percent died or had profound impairment, and 73 died or had impairment. Factors that increased a baby’s chance of survival, in addition to increasing gestational weeks, were female gender, receiving antenatal steroid treatment, receiving intensive care, weighing an extra 3.5 ounces, and being a singleton.

The Vermont Oxford Network (VON) is a non-profit voluntary collaboration of health care professionals dedicated to improving the quality and safety of medical care for newborn infants and their families. Established in 1988, VON is comprised of over 700 neonatal intensive care units (NICU) around the world, and collects data on over 115,000 infants a year. It maintains a database of information about the care and outcomes of high-risk newborn infants. Health care professionals from member institutions participate in clinical trials, long-term follow-up studies and epidemiologic and outcomes research. VON disseminates the results of its work in VON publications and scientific articles in peer review publications. In addition, each participating center gets feedback on their outcomes. This allows individual centers to assess local outcomes. This information can be used to help guide decision-making at the limits of viability. VON traditionally looks at survival in terms of birth weight; so direct correlations with the NEJM article are somewhat difficult to see. However, for comparison purposes, I will provide some specific outcome information.

At Children’s Hospital Minnesota-Minneapolis campus, the 2005 VON data for survival at various birth weights is shown below. VON data is also shown for comparison.

<table>
<thead>
<tr>
<th>Gestation-weeks</th>
<th>Normal (%)</th>
<th>Mild-Moderately Abnormal (%)</th>
<th>Severely Abnormal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>50</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>24</td>
<td>45</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>25</td>
<td>65</td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>26</td>
<td>63</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>27</td>
<td>68</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>28</td>
<td>75</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

Perhaps nothing creates more controversy than discussions about the gestational age at which premature babies should not be resuscitated. Biologic variability makes it almost impossible to identify a single age at which all babies should or should not be resuscitated. In addition, each family’s situation and perspective differs. The above case histories and the discrepancies in the outcome dates shown from different centers above, make generalizations meaningless. Our local approach has been to look at our data, provide the information to parents, and to come to a decision together. The only situation where gestational age should play a role in determining resuscitation is at 22 completed weeks of gestation, assuming a reliable estimate of gestational age. These infants have low survival and poor long-term outcomes.

References:

Jeanne Mrozek, M.D., is a board certified practicing neonatologist and current Assistant Medical Director at Children’s Hospital and Clinics in Minneapolis, Minnesota. She is also Medical Director for the Level II nursery at Mercy Hospital in Coon Rapids, Minnesota and Unity Hospital in Fridley, Minnesota. Dr. Mrozek is a physician member of the Vermont Oxford Network and is a consultant to the ROSE® Program.
For the 24th year in a row, healthcare and disability professionals from across the U.S. and Canada traveled to Minnesota to take part in the annual ROSE Seminar. This year’s seminar was held in September and many attendees commented that the ROSE Seminar is one of the best conferences they attend every year. Much of what made this year’s Seminar such a success is part of the formula that has made the other 23 Seminars so memorable – interesting and timely topics, renowned speakers, lively discussion and networking opportunities; not to mention the food and fun! The annual Seminar is open to ING Reinsurance clients and business associates and no tuition is charged.

SPECIAL EVENTS
The opening night entertainment was a dinner performance of a murder mystery entitled, “Let’s Outsource the Boss.” The show was fun and high energy and even included some audience members as part of the cast. The Seminar also included an evening boat cruise on Lake Minnetonka followed by a Caribbean-inspired meal and live reggae music.

GENERAL SESSIONS
Nine Shift: Work & Life in the 21st Century
Bill Draves, M.A., C.A.E., President and co-founder of the Learning Resources Network (LERN), discussed shifts in the way people will work and live over the first 20 years of the 21st century.

He offered parallels from the dramatic shift in work/life early in the 20th century (1900-1920) to today. While events and outcomes vary between each century, the forces and processes at work are quite similar. The 20th century brought a change from an agrarian age to the industrial age just as we are moving quickly from the industrial to the Internet age. Mr. Draves suggests, among a myriad of predictions, that employee compensation will be built around outcomes rather than time in the office, and that knowledge workers will be the key to the productivity and the economy. He believes that nine major shifts are likely during the early part of the 21st century. Here are four:
• People will work from home
• Dense neighborhoods replace suburbs
• Inequity is addressed: the rich get poorer
• Half of all learning is online


Forget Memory: Changing the Way We Think About Dementia
Anne Basting, Ph.D. discussed the perceptions people hold of others with dementia such as, “the ones who can’t complain,” and “out of sight, out of mind.” Basting emphasized that these perceptions need to be put aside and ways of staying connected must be discovered. She stressed the importance of lifelong preventative care and improving the quality of life through exercise of the brain and heart and social relationships. TimeSlips, a creative storytelling method developed by Basting in 1998, celebrates the humanity of people with dementia and other cognitive disabilities. Through the group process of storytelling the hope, regrets, fears, humor and desires of people with memory loss is captured and helps them connect with caregivers, family, and friends. →
Advancements in Prosthetic Technology…
One Step at a Time

Dale Berry, C.P., F.A.A.O.P., current Vice President of Clinical Operations for Hanger Orthopedic Group, the world’s largest rehabilitation corporation, presented “Advancements in Prosthetic Technology…One Step at a Time.” His inspirational program highlighted the personal struggles of clients who have lost limbs as a result of trauma, disease, or accidents. Video clips provided an insight into the very specialized needs of these patients. Discussion included the comprehensive evaluation used to ensure that the correct prosthesis is selected to provide the best outcome. This approach can take an individual from a totally dependent state to independence.

As the Chairman of the Rehabilitation Forum at Walter Reed Army Medical Center, Berry helped to set standards and policies for the treatment of American soldiers injured with amputations in the Iraq and Afghanistan wars. To date, 750 U.S. military men and women have suffered amputations. The personal stories of several of these individuals showed that with the newest technology, some were able to return to duty, run marathons and have a new positive outlook on life.

Berry was also on hand to sign copies of his book, “Results: There’s No Such Word as Can’t.” In this book, Berry applies his 20 years of personal experience working with people to overcome the challenges of amputation to create a strategy to achieve success.

This high energy, inspirational presentation left everyone feeling, “there’s no such word as can’t.”

Other general sessions included: “If a Newt Can Do It, Why Can’t We? (Future of Regenerative Medicine)” and “Developing Your Emotional Intelligence.”

HEALTHCARE TRACK SESSIONS

The Journey of Blood & Marrow Transplantation: What Case Managers Can Expect on the Road Ahead

Dr. William Flood, chief medical officer for ITA Partners, discussed the current research on Bone Marrow Transplants (BMTs) and presented some issues related to stem cell transplantation in oncology care. He discussed some of the challenges for case managers when dealing with the new stem cell developments. Colleen Merrell, RN, associate director of quality assurance and training specialist at ITA, gave the audience a “case manager’s tool kit” that includes many resources for patient education and clinical information to assist the case manager in his or her everyday work with members with transplants and oncology needs.

New Technologies in Diabetes Care: Impact on Modern Management –

Diabetes in the U.S. is on an alarming rise with cases increasing by more than three million in two years. It is the seventh leading cause of death in the U.S. and has an effect on most morbidity, such as heart disease, stroke, hypertension, blindness, kidney failure, nerve damage and non-traumatic amputations. One out of every 10 health care dollars is spent on diabetes and its complications. Carol Manchester, M.S.N., A.P.R.N., B.C.-A.D.N., C.D.E., spoke about advances in diabetes management including new medications, new monitoring techniques, medical nutritional therapy, activity education, stress management and concurrent management of other co-morbidities such as hypertension and hyperlipidemia. She shared data that showed that new technologies such as pumps, pre-dosed insulin pens, injection ports, intra-peritoneal insulin delivery, and others, increase therapy compliance, reduce the need for multiple injections and reduce risks to neutropenic and thrombocytopenic patients. Manchester also discussed future technologies to look for including: continuous glucose monitoring (CGM) systems, wireless technologies and special systems for hospitals.

Other healthcare track sessions included: “Yikes!” & Other Large Claim Expletives,” “Biologics in Spinal Care,” and “Complex Case Management: The NCQA Perspective.”

Watch for information on the 2009 ROSE Seminar to be held September 29-October 1 at the Hilton Minneapolis.
A Look Back at the 2008 ROSE Seminar

- Excellent – one of the best conferences I attended this year – high caliber of speakers.
- Very impressive, useful and fun conference. Nice job, good value here.
- Everything is great – excellent quality in food and speakers, we are never disappointed!
- I very much look forward to next year.
What Benchmarking Can Teach Us

By Kathleen Thiesen, RN, ING Market Research Analyst

There is nothing really new about the idea of benchmarking. Learning from others is a basic life lesson picked up early on, often in the context of “I’ll show you mine, if you’ll show me yours.” The desire to better ourselves, or our services, through comparative studies has existed for a long time, and continues to be a powerful tool for performance improvement.

Most organizations already do some form of internal benchmarking (e.g., comparing similar activities within their own organization) to evaluate their services and learn from each other in a confined environment. The advantages of this are clear – the information is often easy to access, collected in a similar manner, and highlights best practices among employees and functional areas for achieving similar goals. The transition of these best practices from one area to another is encouraged and often expected. The downside of internal benchmarking is the very limited focus it has in terms of competing in the marketplace.

Competitive benchmarking is the logical next step. “Our outcomes look good, but are they good enough to keep us ahead of the curve?” Competitive benchmarking, like internal benchmarking, looks at similar activities (with other outside organizations) to compare services and learn from each other – just on a larger scale. Benchmarking in the healthcare environment encourages health plans to find ways to consistently measure and improve their performance.

In most cases, the work is already done. Healthcare facilities already have requirements for public overview that demand performance data be collected. As a result, most are already tracking the information that is used in the benchmarking process. With the great number of healthcare delivery systems in the United States, each of them represents a potential benchmarking partner from which to learn and grow.

Since 2005, ING Reinsurance has worked with industry health plans to look at benchmarking for case management services. Benchmarking, by itself, does not create change, nor does it show how others succeed. Its purpose is to compare organizational practices and outcomes. It plays an important role in a bigger picture – continuous quality improvement.

The 2008 ING Medical Case Management Benchmark survey was the third version of this type of industry benchmarking. There are no other comprehensive surveys of this kind (at no cost to participants) in the market currently. Results of this survey were distributed to the participants in October 2008. The comprehensive summary included comparative data on: collaboration with other areas, staffing, compensation, responsibilities, caseloads, savings, and expenses.

Results of the survey were broken down for size, location and membership type to allow segmentation of the data and analysis on multiple levels. There was an even distribution of participating health plans across the U.S., with slightly higher participation in the east. All participating health plans provided or delivered case management services, and all large and medium-sized health plans also delivered disease management services to their members. Approximately 20 percent of health plans were NCQA accredited or pending for review/decision.

Member satisfaction and hospital readmissions were the two most common measures for case management outcomes. Fifty-five percent of participating health plans distinguished between hard and soft savings. Participating health plans provided dollar amounts from savings and expenses realized from case management operations for the 2007 calendar year. An average savings/expense dollar was calculated overall, and for the segmented areas. In all, 23 benchmark areas were assessed and measured in three core areas.

As benchmarking becomes a more commonly used tool externally, individual healthcare plans will be more willing to share information to promote change in the industry, improve patient care, and show value through increased quality of care and return on investment. Benchmarking promotes creative (out-of-the-box) thinking for succeeding in a competitive market.

For more information on the ING ROSE Program, or the Benchmark survey, please contact the ROSE Health Services Consultants at 1-800-767-3509.

Resources:

“Experts discuss how benchmarking improves the healthcare industry”, September 1994, Healthcare Financial Management Association, Gayle L. Capozzalo, MSPH; John W. Hlywak, Jr., FHFMA; Barbara Kenny, MBA; Charles A. Krivenko, MD

Benchmarking in Health Care, Joint Commission on Accreditation of Healthcare Organizations, 2000

“Medical Case Management Benchmarks”, ING Reinsurance ROSE Program, 2008
Earn CEU’s through ING Reinsurance Teleconferences

The ING Reinsurance ROSE® Program offers continuing education credits at no charge to our clients. The teleconferences are well received by ING clients and offer you the opportunity to earn continuing nursing and CCM credits.

Our teleconference in October discussed the controversy surrounding utilization management (UM) versus case management (CM). Sherry Alliotta, a former CMSA President and consultant specializing in care management, presented her perspective on “Utilization Management and Case Management – What is it You Think You Are Doing?” It is recognized that there is continued confusion surrounding titles and role functions for both of these specialties. One highlighted difference is that UM manages to the benefit and CM uses the benefit to manage. Alliotta used the analogy of a utilization manager being a “fire fighter” and a case manager being a “fire investigator.” Participants learned the importance of both roles and the essential part collaboration plays in a successful outcome.

We have an exciting schedule of teleconference topics for 2009!
Watch for future email notifications for specific dates and registration information.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>February, 2009</td>
<td>Ethics for Case Management</td>
</tr>
<tr>
<td>April, 2009</td>
<td>Perinatal &quot;Pearls&quot; • Presented by: ROSEBUD</td>
</tr>
<tr>
<td>June, 2009</td>
<td>Oncology Rx • Presented by; ITA Partners, Inc.</td>
</tr>
<tr>
<td>August, 2009</td>
<td>Mental Health Issues</td>
</tr>
<tr>
<td>October, 2009</td>
<td>Specialty Pharmaceuticals</td>
</tr>
<tr>
<td>December, 2009</td>
<td>Diabetes</td>
</tr>
</tbody>
</table>

Do you have a suggestion for a future topic? We would love to hear from you. Please contact your Health Services Consultant via email or phone at 1-800-767-3509.