ALASKA STATE LEGISLATURE
SENATE SPECIAL COMMITTEE ON WORLD TRADE, TECHNOLOGY AND INNOVATION
April 9, 2009
4:16 p.m.

MEMBERS PRESENT

Senator Lesil McGuire, Chair
Senator Hollis French
Senator Gary Stevens
Senator Bill Wielechowski

MEMBERS ABSENT

Senator Lyman Hoffman

COMMITTEE CALENDAR

OVERVIEW: ADVANCES IN NEUROSURGERY
HEARD

PREVIOUS COMMITTEE ACTION

No Previous Action to Report

WITNESS REGISTER

CHRISTIE ARTUSO, Director
Neuroscience Services
Providence Alaska Medical Center
Anchorage, AK
POSITION STATEMENT: Delivered a presentation on the advances in neuroscience.

ACTION NARRATIVE

4:16:54 PM
CHAIR LESIL MCGUIRE called the Senate Special Committee on World Trade, Technology and Innovation meeting to order at 4:16 p.m. Present at the call to order were Senators Stevens, Wielechowski and McGuire. Senator French arrived soon thereafter.

Overview: Advances in Neurosurgery

CHAIR MCGUIRE announced the business before the committee is to hear an overview on the advances in neurosurgery by Christie Artuso.

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CHRISTIE ARTUSO, Director, Neuroscience Services, Providence Alaska Medical Center, explained that neuroscience services was created a little over a year ago to look at needs of Alaskans who have specific neurologic disorders. At that time she began to look at the use of technology to deliver specific aspects of care. She is here today to share some of the innovations they've begun to implement that will make a difference to access to care and survivability.

Technology continues to advance and facilitate improved quality in the delivery of healthcare. This technology impacts the healthcare system

- Through the use of electronic medical records to provide global accessibility for the patient
- Through the use of computer-chip-based clinical monitoring devices
- Through advanced web-based applications using wireless connectivity to see or evaluate a patient, share information or provide a service that couldn't otherwise be provided
- Through the use of clinical decision software including the ImPACT program and the electronic ICU (eICU), which allows high-level decisions to be made more rapidly and improves the quality of patient delivery by recognizing patient problems earlier than is possible in a traditional model

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Hospitals with multimillion dollar information systems and hospitals without computer systems are moving toward common technology goals, which include implementing technology and software systems to maximize a clinician's time. This technology is user friendly, increases patient safety, produces more positive outcomes, and meets the goals of an organization's strategic and business plans. Clinical alarms that are built into these programs will warn caregivers of immediate or potential adverse patient conditions. For example, caregivers might be able to see the trend of a patient's brain pressure is increasing.

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Programs that are in use here in Alaska include:

- The ImPACT program, which is used for patients with traumatic brain injury from an accident or a stroke.
- The Telestroke program is scheduled for launch in the next two weeks. One cart is installed in Juneau and will connect patients here to Anchorage so that a higher level of care can be provided.
- An eICU was launched on January 27, 2008. This is a computerized intensive care unit that uses clinical software decision support to monitor all patients in an intensive care unit by a nurse and intensivist. Those individuals can use the software to recognize potential problems with a patient before they would be clinically apparent. The practitioner at the bedside could then be alerted to take early action to minimize complications.

MS. ARTUSO related that the annual incidence of sports related concussion is over 300,000, which is equivalent to roughly half the number of people that have strokes each year. Estimates are that 20 percent, or one in five, of all athletes will sustain a concussion during a given sports season.

Post-concussion syndrome happens over a longer period of time; some patients have deficits that will last up to ten years following the initial injury yet they may not have been diagnosed with a brain injury at the time of their accident. These patients suffer from things like chronic headaches; fatigue; sleep disturbances; personality changes; sensitivity to light /noise; dizziness when standing; or deficits in short term memory, problem solving, and academic functions. Suffering a second concussion before repair from a first can be catastrophic. In several states there have been deaths when a second or third concussion follows before the first has had time to heal. Sadly, this is diagnosed on autopsy. She said we are working diligently to raise awareness of the significance to traumatic brain injury to make sure that doesn't happen here in Alaska. The ImPACT program is used to help diagnose and guide treatment. Legislative support is needed to help with the awareness, Ms. Artuso said.

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The post-concussion recommendations are that

1. No adolescent should continue to play or return to a game after sustaining a concussion.
2. An individual sustaining a concussion should cease doing any activity that causes the symptoms of a concussion to increase (headaches, dizziness, nausea, etc) because that could delay recovery. She related that her son sustained a

concussion playing hockey. He underwent ImPACT screening and scored in less than the first percentile on three of four categories. Among other things, the neuropsychologist recommended that he limit video gaming to one hour per day for two weeks. He followed all the instructions but the video game part. When he was reevaluated with ImPACT testing two weeks later he got A's on everything but verbal and visual memory. On those he scored worse than on the initial screening. The next week he followed all the instructions and scored in the 80th and 90th percentile on everything.

3. School attendance and activities may need to be modified.
4. Neuro-cognitive testing is an important component for the management of concussions. It is used in assessing recovery and has been shown to be a most effective tool. It is a computer-based test that can be done on a laptop.
5. No athlete should return to contact competitive sports until he or she is symptom free. Neuro-cognitive tests should be normal both at rest and with exercise.

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ImPACT is a user-friendly, Windows-based computer program that can be administered by a team coach, an athletic trainer or physician with a minimum of training. She noted that at Providence they are using a neuropsychologist to administer this ten-module test that allows assessment of an individual as they exercise and fatigue. The test takes about 20 minutes and is relatively inexpensive. The test measures attention span, working memory, sustained and selective attention time, response variability, non-verbal problem solving, and reaction time. The accuracy has been validated nationwide on various age groups and various types of individuals.

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The different test modules look at

1. Word discrimination, which measures attention.
2. Design memory, which entails displaying a picture and asking the participant to describe what they remember seeing.
3. X's and O's measures visual working memory as well as visual processing.
4. Symbol matching
5. Color matching
6. Three letters, which measures working memory and visual-motor response speed.

The test data is put together by the computer program and can help physicians, athletic trainers and schools all of which make difficult decisions about whether or not an individual should return to play.

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The current users include: the National Football League; Major League Baseball; Professional Automobile Racing; the National Basketball Association, Olympic organizations; the National Hockey League; Junior Hockey, but none in Alaska; the Alaska Aces, but not the junior teams or school systems; rugby; Junior Soccer, colleges and universities, but none in Alaska; high schools throughout the nation, but none in Alaska; the Alyeska Ski and Snowboard Club. An entire team can be given a baseline screening in half a day so that if a member suffers an injury it shows how severe the injury is. If there is no baseline, the test is scored against the approximate norms in the country. This isn't quite as definitive and these decisions are typically made on the conservative side.

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MS. ARTUSO displayed a picture of an air traffic control unit at work and explained that the electronic intensive care unit (eICU) is a system-wide critical-care program that is built on technology that is very similar to an air traffic control unit. This patented program provides technology infrastructure that improves quality, operating efficiency, and economic performance. The eICU program is staffed with an intensivist and critical care nurses at a computerized monitoring station that allows them to monitor hundreds of patients like air traffic controllers monitor hundreds of planes. An intensivist is a physician who is board certified as an intensive care physician. The critical nurses have years of experience and are certified as experts. An eICU facility actually keeps patients safe. Each critical care nurse and intensivist is able to comfortably monitor up to 50 patients. She displayed a pictorial to demonstrate how an eICU interacts with big city hospitals, community hospitals, and rural hospitals to deliver a higher level of care by providing guidance and decision-making.

MS. ARTUSO displayed a picture of the eICU computer support technology. One screen lists the patients. Red and yellow bars alongside each name indicate various alerts. Another screen shows a selected patient's vital signs and electronic medical records. Yet another screen allows the intensivist or nurse to access imaging studies. This information is combined to get a full picture of the patient. Additionally, there is a camera in

every patient's room so it's possible to see the patient and talk to the nurse or physician who is live in the room. Lab tests are automatically fed into the system so all the reports from diagnostic studies are in one location.

MS. ARTUSO said health care has safety and quality problems because it relies on outmoded systems of work. We want safer and higher quality care and we will therefore need to redesign the systems that are used.

4:40:58 PM
SENATOR MCGUIRE apologized that the members are pressed for time and asked if she would summarize what the technology is, where it is being used in Alaska, where use should be expanded.

MS. ARTUSO said the eICU at Providence in Anchorage currently monitors 30 ICU beds. It has not been introduced to other facilities because of the cost to lease the patented eICU program. She noted that there is a potential for Medicare to require the presence of an intensivist in every ICU and if that occurs, this program would bridge that gap. This is important because there aren't enough intensivists in Alaska to staff all the ICUs in the state.

She said the biggest problem with stroke care is the lack of stroke neurologic expertise in rural hospitals. The first stroke neurologist came to Alaska in September 2008. He is located in Anchorage and is the director of this program. Basically, they use a webcam, a computer on wheels, and a laptop for the stroke neurologist. It's possible to log in and do a patient consult anyplace that has wireless Internet. The interactive cart makes it possible to see and talk to the patient, evaluate the severity of their stroke, look at their CAT Scan and diagnostic tests, and make a decision about treatment. This is important because strokes can only be treated effectively within three hours within onset of the symptoms. In Anchorage they have the capability for two additional procedures. One is to use intra-arterial medication to dissolve a clot in the brain and the other is to insert a clot retrieval device into the vascular system of the brain and pull the clot out. That can be done within six hours of onset of symptoms.

Currently Juneau, Kodiak, Seward and a second location in Anchorage have a telemedicine cart and there are plans to put them in a number of other areas across the state. We're confident that this is going to be successful here in Alaska, she said. The decisions to bring this technology to the state

were based on the patients in Alaska, their needs and the outcomes. This state has one of the worst stroke death rates in the U.S. but that will be improved through the use of this program. They are trying to develop strategic partnerships with hospitals and corporations statewide to deliver this level of care to the people of the state because they deserve that access. This addresses one of the major national healthcare goals, which is access to quality healthcare. That access can be bridged through an electronic ICU, through a telestroke or telemedicine system, and through ImPACT screening.

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SENATOR FRENCH thanked Ms. Artuso for an excellent presentation.

SENATOR MCGUIRE said the members of this committee will pass this information along.

SENATOR FRENCH added that it's another argument for webcams; the presentation could be streamed to the public at the same time that the committee is hearing it.

MS. ARTUSO related that in the near future the stroke neurologist will give a presentation that will be streamed live to five different hospitals.

4:48:50 PM
There being no further business to come before the committee, Chair McGuire adjourned the meeting of the World Trade and Technology Special Committee at 4:48 pm.