

**4-09-09
Overview:
Advances
in Neuro-
surgery**

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Neurosurgery</subject><comm>SWTR26</comm></target>

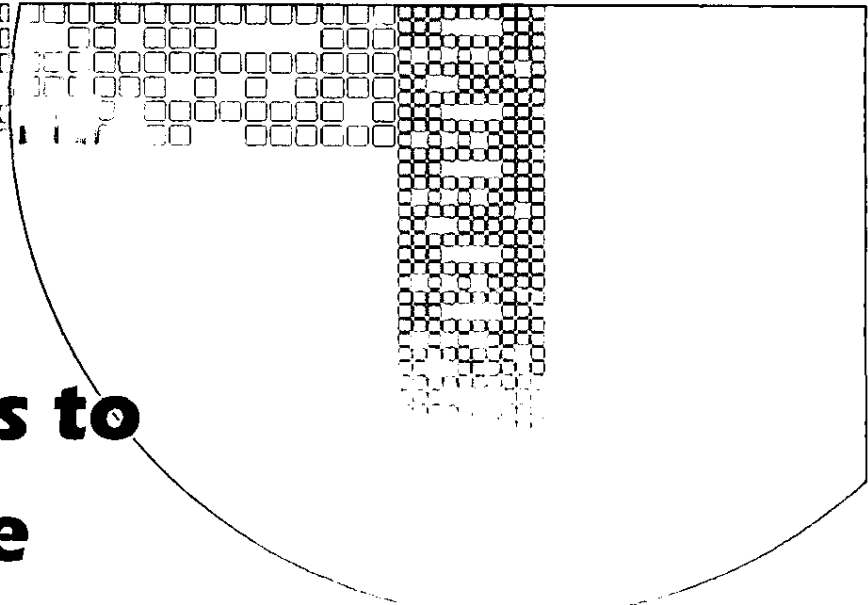
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Delivering Quality Healthcare Through Technology



Technology continues to advance and facilitate improved quality in the delivery of healthcare in a dynamic and complex environment.



How does technology impact our healthcare system?

- **Clinical information systems [electronic medical records]**
- **Computer-chip–based clinical monitoring devices**
- **Advanced Web-based applications with remote, wireless communication devices [REACH Call]**
- **Clinical decision support software [ImPACT] [eICU]**

Clinical Transformation.....

- **The concept of clinical transformation is developed with new models of care delivery being**
- **Supported by technology rather than driving care delivery.**



Hospitals with multimillion-dollar information technology systems and hospitals with almost no computerization and “smart” devices at the bedside have moved toward common technology goals.

These goals include implementing technology and software systems that maximize clinician time in clinical care, are user friendly, increase patient safety, produce positive outcomes, and meet the goals of the organization’s strategic and business plans.

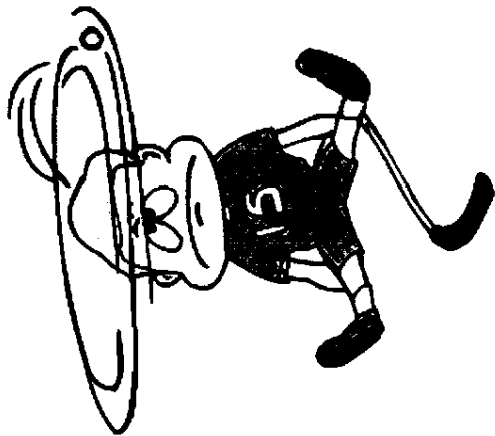


Impact on Safety

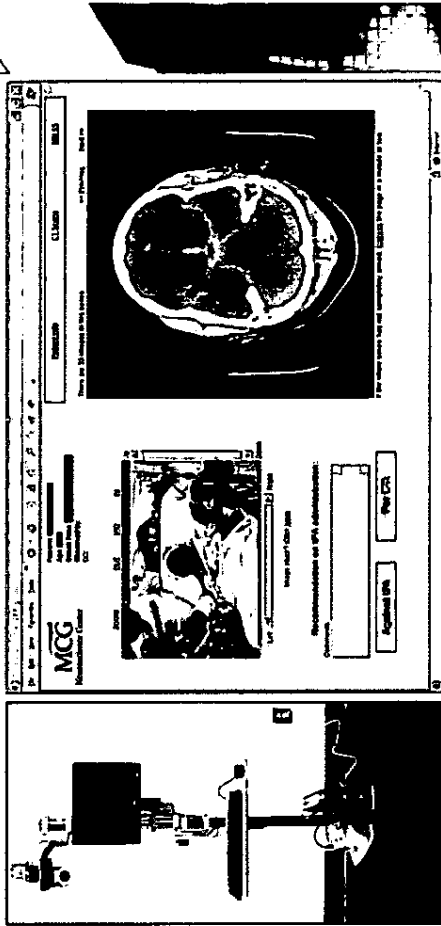
Clinical alarms warn caregivers of immediate or potential adverse patient conditions. Alarms must be accurate, intuitive, and provide alerts that are readily interpreted and acted on by clinicians in an appropriate fashion.



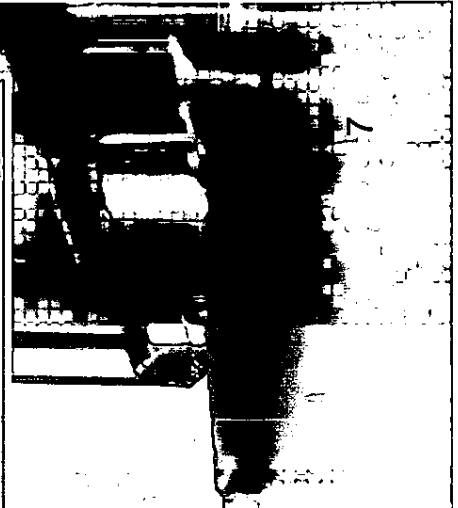
IMPACT



Telestroke



eICU



ImPACT

- **What is a concussion?**
 - **A disturbance in brain function that occurs following either a blow to the head or as a result of the violent shaking of the head.**
- **Annual incidence of sports related concussion is ~ 300,000**
- **Approximately 20% of all athletes are likely to sustain a concussion during a given sports season**

Post-Concussion Syndrome

- **Chronic cognitive and neurobehavioral difficulties related to recurrent injury**
 - **Chronic headaches**
 - **Fatigue**
 - **Sleep difficulties**
 - **Personality changes**
 - **Sensitivity to light/noise**
 - **Dizziness with standing**
 - **Deficits in short term memory, problem solving, academic functioning**

= Suffering a second blow while recovering from an initial concussion can be catastrophic

Post Concussion Recommendations

- 1. No adolescent with a concussion 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) – recovery could be delayed**

Post Concussion Recommendations

3. School attendance and activities may need to be modified

4. Neuro-cognitive testing is an important component for the management of concussions

- Used as one piece of the puzzle; a tool in assessing recovery from concussions and determining the timing of return to full activities**
- Most effective with a baseline test**



Post Concussion Recommendations

- 5. No athletes should return to contact competitive sports until they are symptom free, both at rest and with exercise and have normal neuro-cognitive testing**

Post Concussion Syndrome may last for greater than a month:

- Sleep issues**
- Concentration and memory issues**
- Depression and other psychiatric problems**



What is ImPACT?

- **User friendly, Windows-based computer program that can be administered by a team coach, athletic trainer or physician with minimum training.**
- **10-modules**
- **Allows for an assessment of processing speed as the player fatigues**
- **Test takes about 20 minutes**

What does ImpACT measure?

- **Attention span**
- **Working memory**
- **Sustained and selective attention time**
- **Response variability**
- **Non-verbal problem solving**
- **Reaction time**

Modules

1. Word discrimination

- Attention processes/verbal recognition

2. Design memory

- Attention processes and visual recognition memory

3. X's and O's

- Measures visual working memory as well as visual processing

4. Symbol matching

- Visual processing speed, learning and memory



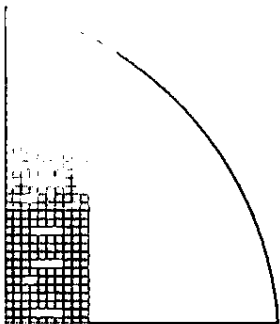
Modules

5. Color Match

- CHOICE REACTION TIME TASK AND MEASURES IMPULSE CONTROL/RESPONSE INHIBITION

6. Three Letters

- MEASURES WORKING MEMORY AND VISUAL-MOTOR RESPONSE SPEED

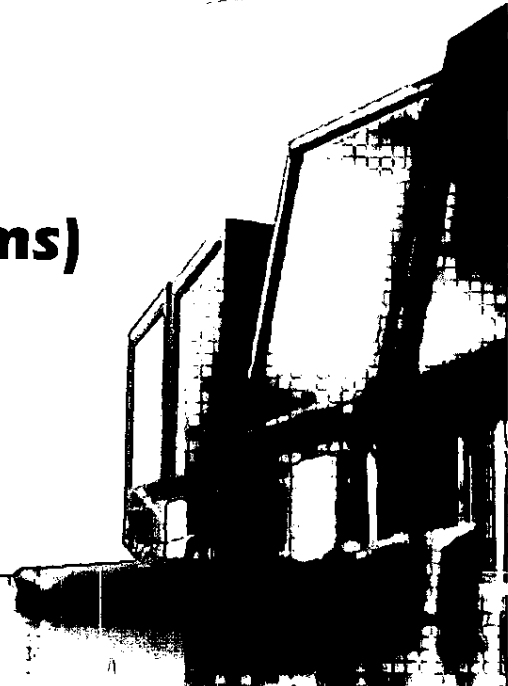


Other features.....

- Measures player symptoms
- Computer administered
- Can be administered on a lap-top
- Assists physicians and athletic trainers in making difficult return-to-play decisions
- Permits individual and group administration
- Results can be emailed or faxed for fast consultation by a neuropsychologist
- Measures attention, memory, processing speed and reaction time
- Reaction time measured to 1/100th of a second

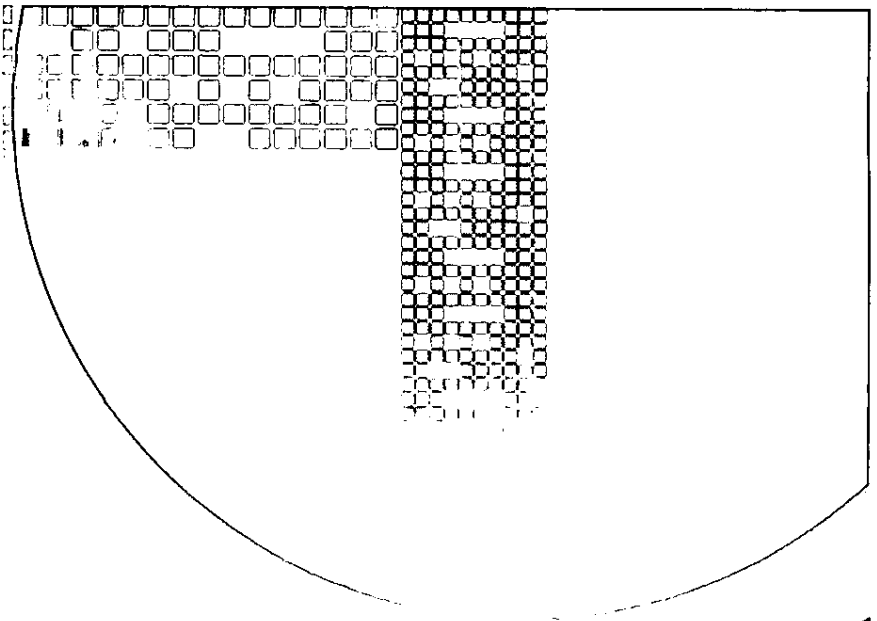
Current Users?

- **National Football League**
- **Major League Baseball**
- **Professional Automobile Racing**
- **National Basketball Association**
- **Olympic Organizations**
- **National Hockey League (all NHL teams)**
- **Junior Hockey [none in Alaska]**
- **Alaska Aces**
- **Rubgy**
- **Junior Soccer**



Current Users?

- **Colleges / Universities**
 - None in Alaska
- **High Schools**
 - Throughout the U. S.
 - None in Alaska
- **Club Teams**
 - Alyeska Ski and Snowboard Club



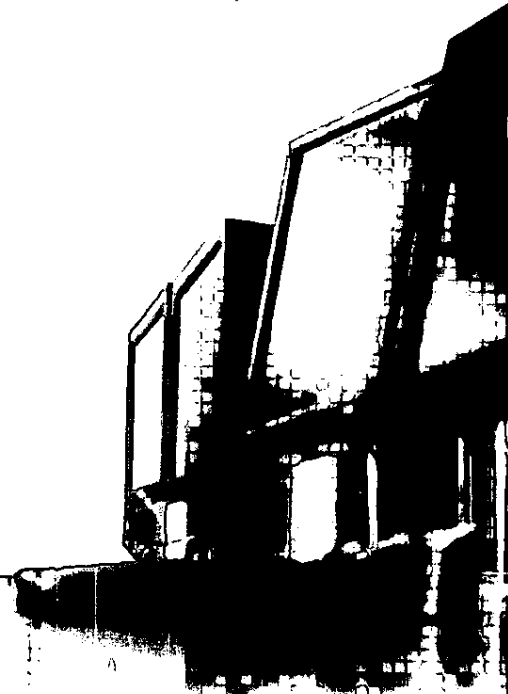
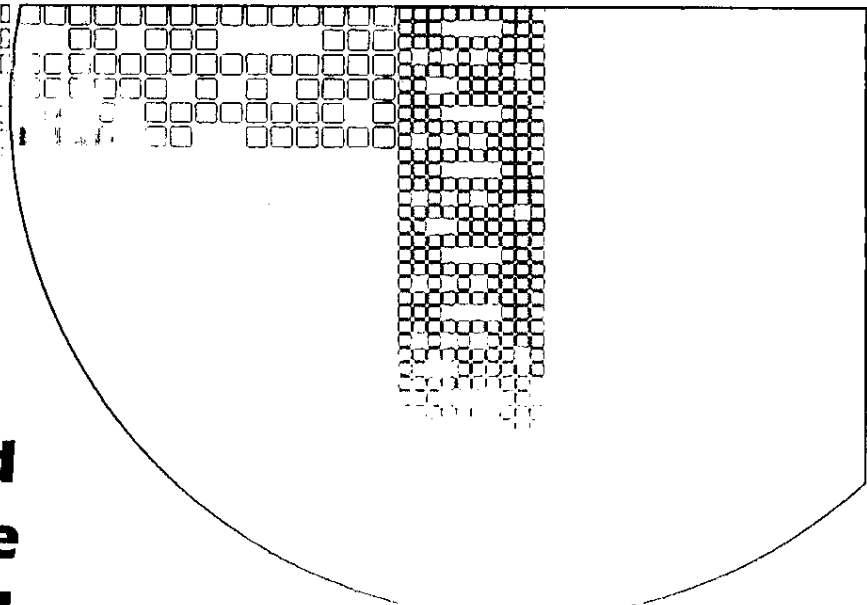


eICU

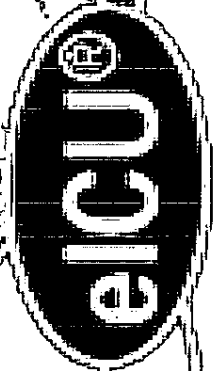
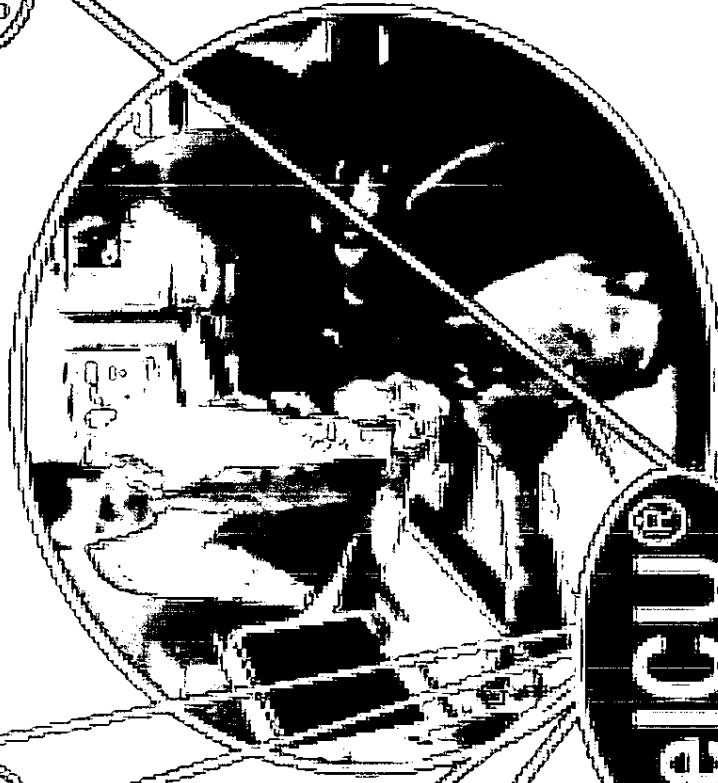
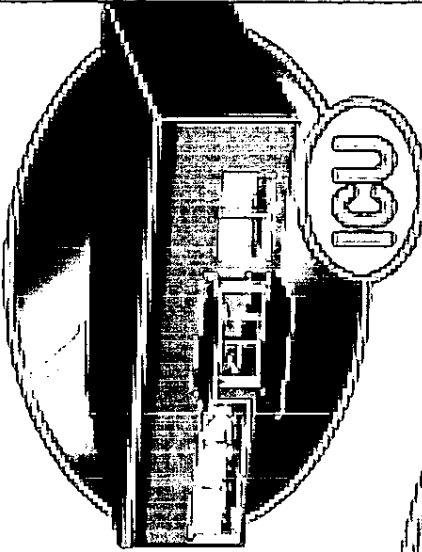
The patented eICU[®] Program allows hospitals to create a system-wide critical care program, built on a powerful technology infrastructure that improves quality, operating efficiency, and economic performance



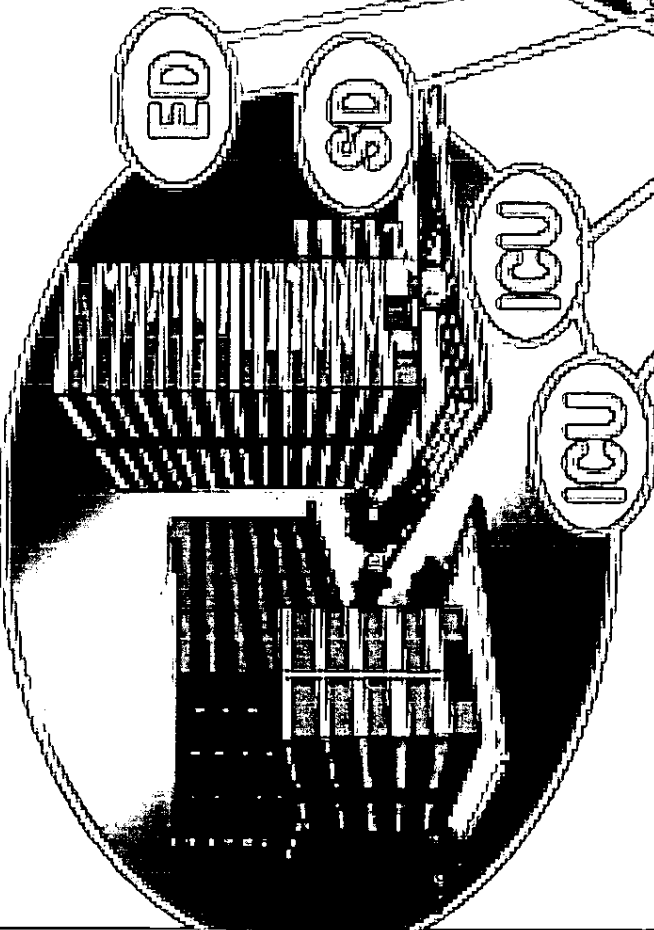
- **An eICU Program is staffed with an intensivist-led care team that can monitor and care for hundreds of patients much like air traffic controllers monitor hundreds of planes.**
- **An eICU facility keeps patients safe!**



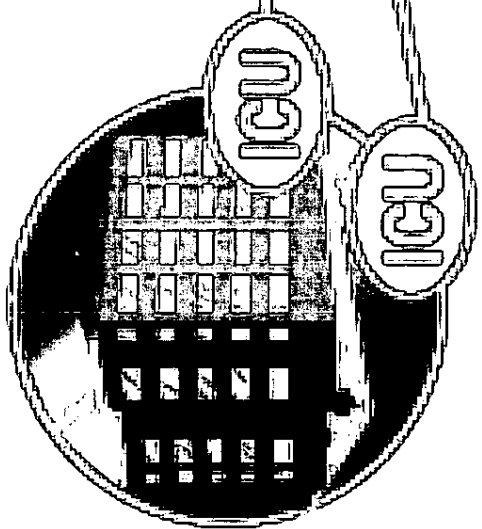
Rural Hospital



Big City Hospital



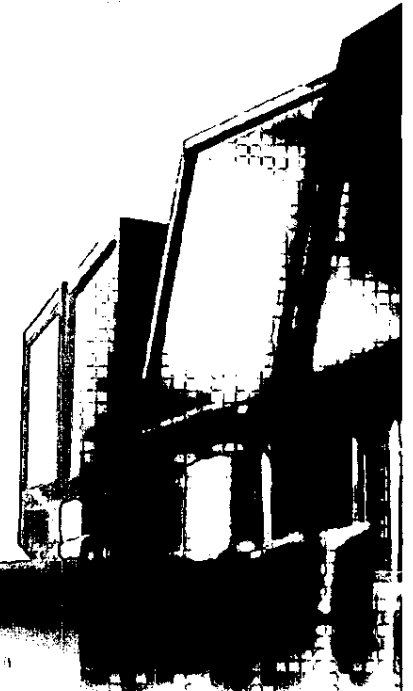
Community Hospital





Why use technology to deliver critical care?

- **Health care has safety and quality problems because it relies on outmoded systems of work**
- **If we want safer, higher-quality care, we will need to have redesigned systems of care**
- **The “Leapfrog Group” states that Intensivists should staff intensive care units**



What is an eICU

- **An innovative, remote-care strategy available from VISICU™, designed to improve ICU care processes while leveraging scarce intensivist resources**
- **Reduces clinical complications**
- **Has been shown to reduce mortality by more than 25%**
- **Combines advanced software systems and telemedicine to create a unique approach for off-site hospital personnel to deliver critical care**



Delivering Stroke Care Through Technology

Ideal management of acute ischemic stroke entails the timely presentation of the patient to the hospital and a quick and efficient response on the part of the emergency medicine and neurology departments (combined with advanced and expert poststroke care in the stroke unit.



Epidemiology

- **About 800,000 stroke cases are reported each year in the United States – 500,000 are new onset**
- **Stroke is the third leading cause of death in the United States and the 4th leading cause of death in Alaska**
- **Stroke is the leading cause of disability.**

Significance.....

- **Of all stroke survivors, 90% have permanent deficits.**
- **Stroke cases represent \$6 billion in hospitalization costs annually.**
- **Total cost of stroke-related medical cost and disability in the United States was approximately \$57 billion (American Stroke Association, 2005).**



Stroke care in the US and in the world is fragmented and mostly unavailable in rural areas. The primary reason for poor stroke care is the lack of neurological expertise in rural hospitals.

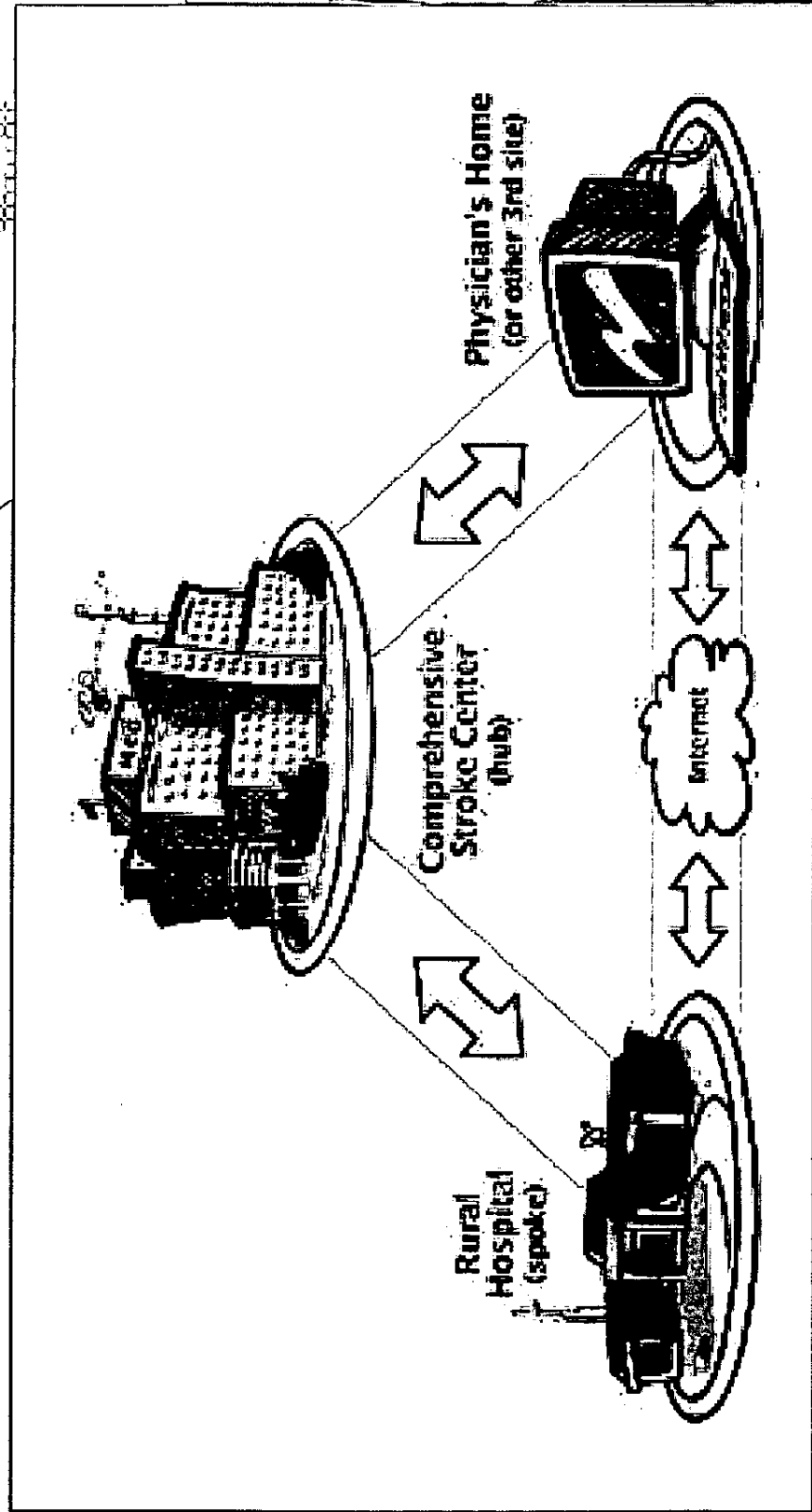


What does Alaska look like?

- **42% hospitals have stroke protocols**
- **63% have clot busting drugs**
- **57% thought that telemedicine would be useful for stroke**
- **84% have DICOM - CT Scanners**
- **Average time to CT – 30 minutes**
- **63% transfer to Anchorage**
- **27% transfer to Seattle**



Hub and Spoke Model of Care



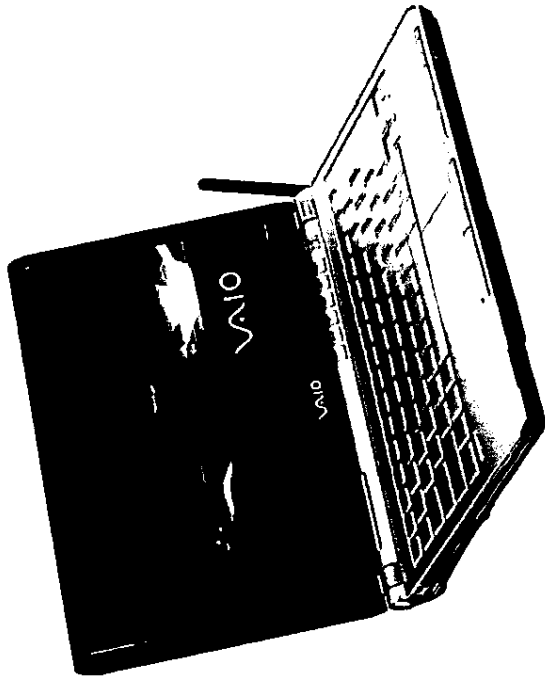
Components of a Comprehensive Stroke Center

- **Stroke Team (neurologist; neurosurgeon; specialized nursing staff; stroke unit; rehab assessment)**
- **Diagnostic radiology**
- **Specialized physicians (interventionalists; neurologists; neurosurgeons)**
- **Critical care medicine**
- **Surgical and Interventional Therapies**
- **Stroke registry**

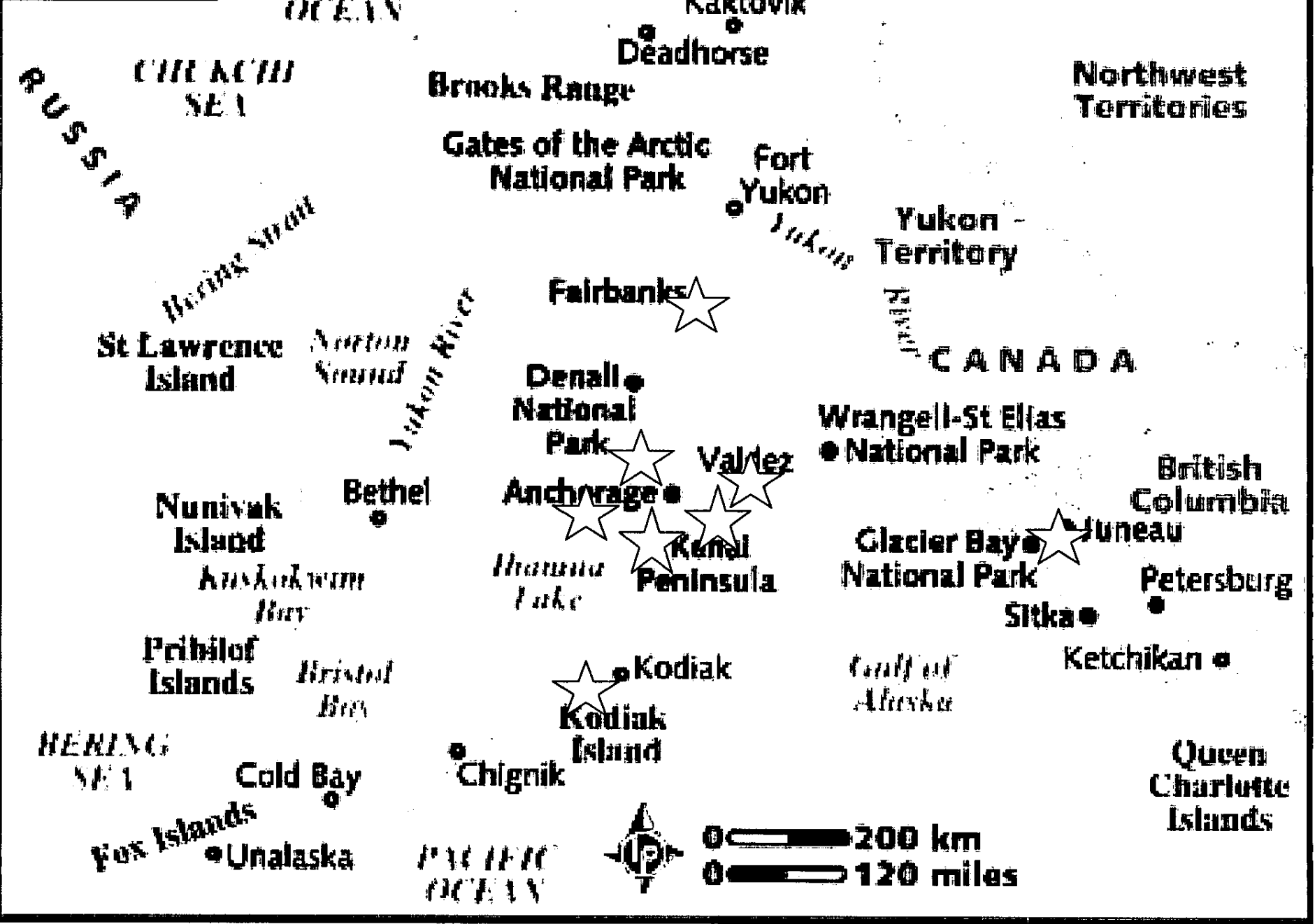




REACHMID
CONSULT



ALASKA



Benefits of Telemedicine through REACH Call, Inc.

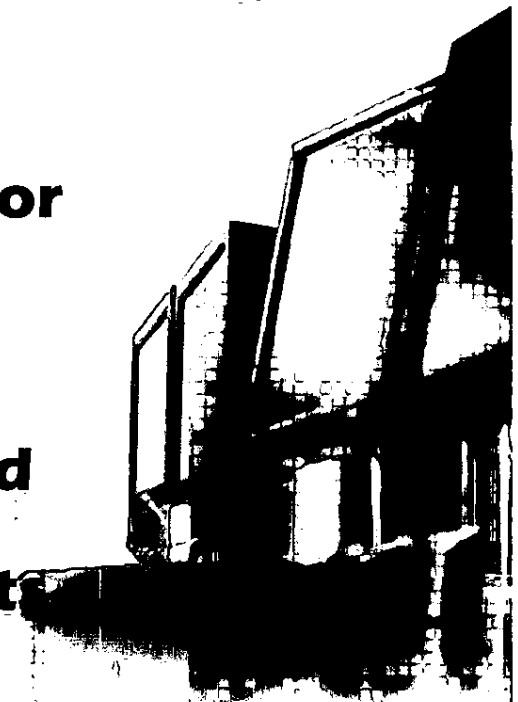
- **Consulting Physician is Local and 100% Mobile**
- **Eliminates Travel, Saves Time and Brain!**
 - REACHcall, Inc. eliminates the geographic penalty associated with critical care for stroke and other acute medical conditions.
 - **Time is Brain! Time saved is Brain saved!**



Benefits of Telemedicine

- **Turnkey Service**

- **No hardware in the Hub, Off the Shelf, Standard Hardware in the Spoke hospital.**
- **Physicians can use their own laptop or PC at home, in their clinic or in the hospital to provide REACH consults.**
- **Reduces Total Cost of Ownership and allows for use of better hardware without incurring huge upgrade costs**



- **Thin Edge, Intelligent Core Service Model**

- **Web based access to centralized, database driven consult modules for stroke and other acute medical conditions.**
- **On-demand, real-time access to consult reports for immediate, accurate and complete billing for hospital and physician services.**
- **Real-time reports for measuring hospital and physician performance, optimizing treatment and standardizing critical care.**



What's next?

- **Raising the bar on care for patients with mild-moderate traumatic brain injury; critical illness, and stroke care**
- **Public awareness campaigns including prevention**
- **Media coverage**
- **Collaborative initiatives**
 - **Strategic partnerships**
 - **Shared resources**



Any Questions?

