Advanced Broadband:
A Foundation for HSHS Care Integration

Laying groundwork to utilize advanced, reliable, efficient and cost-effective technologies and relationships to link patients, providers and care facilities

In America today, a fragmented healthcare delivery system limits coordination across providers and health care settings and an outdated infrastructure further impedes communication. At Hospital Sisters Health System (HSHS), our Care Integration strategy uses technologies and relationships with advanced broadband to intentionally link patients, providers and care facilities. The result is superior value and improved care coordination, enhanced efficiency with reduced costs, and increased satisfaction for our patients and providers.

The Challenge: Dense files of medical information cannot be shared in a timely and coherent fashion using low-capacity broadband. Commercially-provided private broadband—often analogous to a narrow two-lane road—cannot accommodate the advanced data exchange needs of hospitals (which are analogous to a multi-lane freeway). Essential applications such as accessing a Picture Archiving and Communications System (PACS) diagnostic file or sharing Electronic Health Records (EHR) require advanced broadband speeds of 100 megabits (Mbps) to one gigabits per second (Gbps). Because these speeds are seldom available at any price (or, if available, are prohibitively expensive), HSHS Care Integration faces many obstacles due to a lack of fiber optic infrastructure.

The Solution: Distance should never be a barrier to the best possible health care. In medical emergencies, fast and reliable access to health care professionals, health records and diagnostic images—using technology connected by advanced broadband—can be decisive factors that save lives and improve outcomes.

Advance broadband networks are foundational to HSHS Care Integration because they remove the distance between caregiver and patient—particularly in rural areas. Not only does advance broadband expand health care access, it expedites treatment, improves quality and reduces costs through enhanced communication, coordination, and efficiency across providers and settings.

What is Advanced Broadband?

Using a highway analogy, broadband is a kind of physical roadway network for sharing digital data.

- ***High-capacity advanced broadband*** *is analogous to a multi-lane freeway and often utilizes fiber optic cable infrastructure to provide speeds of 100 Mbps (megabits per second) to one Gbps (gigabits per second) and beyond*
- ***Lower capacity broadband*** *is analogous to a narrow road and may utilize copper, wireless or satellite technology.*

Advanced broadband allows the whole person to be cared for by a whole health care community throughout the continuum of care settings: hospitals, clinics, physician offices, rehabilitation and skilled nursing facilities, hospice and home. It breaks down barriers by supporting and coordinating patient and provider relationships with a free flow of critical information between providers.

Hospitals utilize advance broadband for:

1. *Storage of and access to digital imaging modalities including radiology and advanced cardiology studies*
2. *Telemedicine and other telepresence links*
3. *Shared applications (electronic health records, data backup, telephone, paging, voice mail, etc.)*

Broadband expands relationships to allow organizations to share medical technologies to link patients, providers and care facilities. Its connectivity helps bridge the "digital divide" between urban and rural hospitals and helps caregivers reach vulnerable populations (low income, minorities, older adults, and individuals with disabilities or who need chronic care). The result is improved care coordination, superior value through the elimination of variability, and innovative solutions that can address shortages of health care professionals. Advanced broadband increases patient and provider satisfaction.

Broadband Landscape

- **Challenges to broadband Care Integration in Wisconsin:** Wisconsin is among the worst states in the nation in terms of high-speed broadband access with a 2011 ranking of 45th in the nation by the national broadband map. This ranking is a significant challenge to HSHS Care Integration, especially since neighboring states provide a vastly better broadband landscape (Michigan is ranked 19th, Minnesota is ranked 28th, and Iowa is ranked 34th). With surrounding states far ahead in their broadband infrastructure connectivity efforts, Wisconsin health care faces greater obstacles to care coordination across providers and health care settings. This reality also adversely impacts both the recruitment and retention of needed health care professionals.

  Because Wisconsin's telecommunications industry and legislative climate have not encouraged public-private investments in advanced broadband, many Wisconsin hospitals have invested at great cost to create private fiber optic networks. Hospitals have also collaborated with municipalities, schools, colleges, universities, libraries and non-profits to create community area networks (CANs).

- **Illinois:** According to the FCC's national broadband map, Illinois is ranked near the top quarter of the 50 states for broadband availability. This infrastructure provides a strategic advantage to HSHS Care Integration for eight HSHS hospitals (including two critical access hospitals), Physician Networks (including HSHS Medical Group and Prairie Cardiovascular Consultants), the St. John's College of Nursing, and HSHS in Illinois.

Hospitals Need Broadband that is:

- **Fast**
- **Accessible**—even for rural and critical access hospitals
- **Reliable**—with redundant links to assure mission critical applications are available 24/7 without the risk of downtime that could interrupt applications like telemedicine
- **Affordable**—to bend the cost curve

Linking Patients and Providers, Broadband Supports:

- **Sharing** applications to:
  1) **Coordinate and expedite patient care** through file sharing including MEDITECH and SoftMed Electronic Health Records (EHR) & icture Archiving & Communications System (PACS) CT and MRI diagnostic files
  2) **Reduce costs** through shared software applications (common telephone, paging, voice mail, email, & file storage and sharing)
  3) **Support a** Tele-Radiology Image Hub at Sacred Heart Hospital (Eau Claire, WI) to allow images to be sent or viewed between 43 healthcare facilities across western Wisconsin and eastern Minnesota using CINC fiber
- **Telemedicine** for interactive face-to-face physician examinations of patients to speed stroke, heart attack and other emergency treatments where minutes count (or to reduce the need for patients to travel long distances for care)
- **Faster emergency and trauma care** by physician telepresence in emergency rooms & ambulances
- **Improved health care access** to reduce disparities in rural areas & vulnerable populations
- **New solutions** to alleviate shortages of health care professionals by allowing centrally located clinicians to expand "on call" coverage
- Development of a statewide **health information exchange (HIE)** network in Illinois and Wisconsin

Linking Physicians, Care Facilities and Universities

Advanced Broadband links urban and rural providers, clinics and nursing centers. It facilitates dynamic partnerships to enable key players in the health care equation to seamlessly work together. It allows:

- Improved timely physician communication and coordination for better patient care
- Enhanced working partnerships between hospitals and universities (St. Louis University, Southern Illinois University School of Medicine and the UW Department of Family Medicine)
- Expanded distance continuing education opportunities by the St. John's College of Nursing, physician Grand Rounds (including surgical or cardiology cases) and other continuing education

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A Patient Story

A young woman had leg surgery in a large Minneapolis, MN, hospital. After returning to her home in western Wisconsin to recuperate, she awoke to find her leg cold. After consulting with her surgeon, she was advised to go to the nearest hospital emergency room (which happened to be St. Joseph's in Chippewa Falls, WI) for a Doppler ultrasound test. The high-resolution Doppler video, after being "read" by a radiologist, would help determine if the coldness was symptomatic of a life-threatening blood clot that would require emergency treatment.

Unfortunately, it was late in the day on a weekend, and there was little likelihood that a radiologist would be available to immediately read the results on-site. Like many radiology studies, the Doppler is a large video image that could only be transmitted through a high speed advanced broadband network. The alternative would be to transport the file on physical media (such as a DVD) to a radiologist, transfer the file at a slower speed over traditional networks, or wait hours to have a radiologist travel to the hospital to read the images. In this case, after the diagnostic imaging procedure was completed, the file was instantly transmitted to the HSHS Division (Western Wisconsin) Tele-Radiology Image Hub located at Sacred Heart Hospital over a highly redundant 10Gb/sec advanced broadband Chippewa Valley Inter-Networking Consortium (CINC) fiber network.

It was then accessed by an on-call radiologist at home, approximately 30 miles away. Within minutes the file was downloaded, opened and "read," and the patient in Chippewa Falls was reassured that it was not a life-threatening blood clot. She was instructed that she could go home, apply warm compresses, and rest. Not only did the Tele-Radiology Image Hub expedite an emergency "read" to reassure a patient, it prevented a costly and unnecessary transport to a larger city hospital or an extended wait for a radiologist to view the image file.