Penn State Hershey Medical Center's Journey to State-of-the-Art Telemedicine

Based in South Central Pennsylvania, Penn State Hershey Medical Center (PSHMC) is a 563-bed academic hospital and one of the premier comprehensive stroke centers in the state. The hospital averages 800 stroke patients per year, with many of those transferred from rural hospitals where stroke-based expertise is limited or unavailable. The primary issue with transferring stroke patients: tPA must be administered to ischemic stroke patients within three hours from the onset of symptoms. By the time a patient was transferred, that critical treatment window had often closed.

Having some of the leading stroke specialists in the country, PSHMC saw the opportunity to create a comprehensive telemedicine program that could reduce transfer rates from rural hospitals and help get time-critical treatments to stroke patients faster. Today, the LionNet program provides real-time stroke expertise from PSHMC to a network of regional hospitals, and it has quickly become one of the most sophisticated telestroke networks in the country. Not only did the program dramatically improve patient care for stroke victims, but it was also designed in a way that greatly benefits both PSHMC and its network of spoke partner hospitals.

In this paper, you will learn about PSHMC's telestroke network and how the hospital built it from the ground up. The article will also share PSHMC's best practices and proven strategies for other hospitals to utilize when developing a telemedicine network of their own.

Inside:

How Penn State Hershey dramatically increased tPA use

Integrating telestroke into existing partner hospital workflows

Continuous improvement through regular communications and data review

Snapshot of the LionNet Program

PSHMC worked diligently both internally and with REACH Health to establish a sophisticated, hub-and-spoke-based telemedicine network for the South Central region of Pennsylvania. Today, PSHMC provides its spoke sites with remote, real-time neurological consultations with stroke neurologists and neurosurgeons. What makes the LionNet program even more unique is that it includes only dedicated stroke-care specialists – not fellows, general surgeons or attendees – to ensure the best patient care.
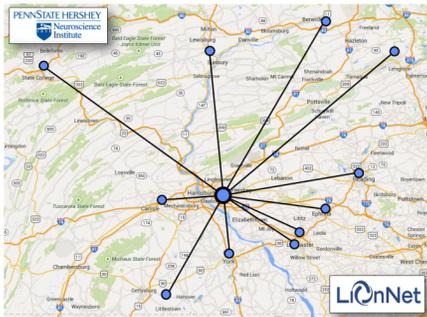
Established in the summer of 2012, the LionNet program today includes 11 spoke sites within two hours of PSHMC and has completed roughly 1000 stroke consults. PSHMC anticipates three more spokes sites going "live" in the network by early 2015.

Phase One:
Creating LionNet – A Vision of Partnerships and Long-Term Relationships

When setting out to create the telestroke network, Dr. Raymond Reichwein, LionNet's medical director, said that PSHMC wanted "to be the pillar of the community, the true academic hospital and the true hub site." To accomplish this, Dr. Reichwein and his team had a clear, two-pronged vision in mind for what they wanted the program look like. While the focal point was always to improve acute stroke care, PSHMC wanted LionNet to achieve that through fostering long-term relationships across the continuum of care and creating true partnerships with regional hospitals.

From the beginning, PSHMC set the precedent with its spoke hospitals that it would be there for the long haul to help with any type of stroke-related care (from pre-hospital and acute care to rehab and preventative care). Unlike other telemedicine programs, PSHMC did not want to simply provide the technology, but to also create mutually beneficial partnerships with the regional hospitals that would lead to optimal treatment outcomes.

With its vision in place, PSHMC defined a series of ambitious, but attainable goals for LionNet. Keeping in step with its partnership vision, PSHMC collaborated on its goals with the spoke sites before moving forward with the program. Their goals included adopting uniform care (pathways and protocols), enhancing the comfort level of stroke patients at spoke hospitals, increasing the use of intravenous tPA treatments, transferring select patients in a timely fashion and improving patient/family satisfaction. Finally, one goal unique to the LionNet program was to work closely with spoke hospitals to help them eventually become primary stroke centers of their own.

Phase Two:
Building the Hub-and-Spoke Network

What differentiates PSHMC's telemedicine program is its unique hub-and-spoke model built on the foundation of partnership. With many telemedicine programs, the hub site provides the technology and, from there, adopts a "set it and forget it" mindset. With LionNet, PSHMC has established true partnerships with its spoke hospitals – working to improve patient care, but also to strengthen business for both itself and the regional hospitals through improved admission and reimbursement rates. Here are the steps that PSHMC went through to set up its spoke hospitals for long-term success.

Step One: Create a Strong Hub Site
In order to run the telemedicine program that it wanted – and to confidently provide its partners with the expertise, guidance and support that they (and their patients) deserved – PSHMC took a year to strengthen the foundation of LionNet's "hub." During that time, Dr. Reichwein and his team secured the proper buy in, recruited internal champions, set the vision, mission and goals, defined policies and protocols, found the right technology partner and developed a community education plan.

The education component of PSHMC's foundation building was an important step and one that is often overlooked with other telemedicine programs. According to Dr. Reichwein, "just because you build something special and perfect, doesn't mean they will come." Many people still do not know the signs and symptoms of a stroke, the treatments and urgent care available and the time-sensitive nature of getting those treatments as soon as possible. PSHMC launched an aggressive and continuous regional education campaign focused on stroke awareness and the resources available through LionNet.

Step Two: Articulate the Benefits to the Spoke Sites
When a telemedicine network is rolled out, spoke sites are often left wondering, "what's in it for us?" or "is this all about the hub?" Since PSHMC views its spoke sites as partners, it wanted to clearly articulate the benefits and long-term goals for them. LionNet would help the spoke hospitals reduce time-to-acute treatment, increase tPA rates and reduce unnecessary transfers. The program would also help increase the spokes' admission and reimbursement rates since more stroke patients would stay onsite rather than be transferred to PSHMC. Finally, PSHMC stressed that it would work with the spoke hospitals to help them become primary stroke centers. Establishing excitement about participation in the program and the anticipated benefits helped to strengthen the partnership mentality and ensure a successful roll-out.

"They call us the 'TV Doctors.'"

Step Three: Complement Existing Infrastructure

When the time came to implement the telemedicine technology, Dr. Reichwein and his team knew that each site would be different, depending on resources, processes, personnel and existing infrastructure. The PSHMC team met with the key stakeholders at each spoke site to determine what they had and what they needed, evaluate strengths and challenges and set realistic goals for implementation.

In many telemedicine programs, the influx of new technologies and processes at spoke sites can significantly impact workflows. Due to that concern, PSHMC did not try to replace existing workflows at the spoke hospitals, but rather complement them. According to Dr. Reichwein, the key was to work within the constructs of what they had and build out from there. For LionNet, everything was designed to fit seamlessly into the spoke hospitals' existing workflows. Although the underlying REACH Access technology is capable of implementation in a spoke hospital in as little as 10 weeks, PSHMC purposefully rolled out the program gradually to its partner hospitals – averaging three to six months for a full implementation at each site.

Step Four: Encourage Ongoing, Two-Way Communications

Once LionNet was running at its spoke sites, the work did not end for PSHMC. In fact, some of the most important components of the program were ongoing communications and continuous improvements. Dr. Reichwein calls the continuous flow of information and the sharing of timely feedback (both good and bad) between the hub and spokes a "two-way street."

In addition to regular contact with coordinators and an annual telestroke conference at PSHMC, Dr. Reichwein and his team conduct quarterly visits with the spoke sites to review data in person and look for opportunities to improve patient care across the network. They also host bimonthly coordinator meetings in which all of the spoke sites meet to review network data and share best practices. Having in-person meetings and regular contact has promoted "team bonding" among the different sites and has been instrumental in making PSHMC's partnership vision a reality.

Phase Three:
Maintaining Momentum

In order to keep LionNet's momentum going after the initial kickoff, PSHMC needed a formal maintenance plan. As with any initiative, PSHMC knew there would be ups and downs such as physician, nurse or coordinator turnover or hiccups with technology or processes. PSHMC had to find ways to seamlessly overcome bumps in the road, while keeping people upbeat and focused on sustaining the program over time.

According to Dr. Reichwein, "It can't be emphasized enough that if there are problems, you must address them as quickly as possible before they escalate … If a problem gets too far out of control – even if it's correctable – it is a lot harder and more time consuming to resolve. We try to address anything that comes up that seems significant as soon as possible."

Dr. Reichwein's team has emphasized several aspects of program maintenance that they have found to be highly successful. As noted above, PSHMC conducts regular on-site visits with its spoke partners to review data, address challenges and collaborate on new opportunities. Data sharing for each spoke site and the network is highly transparent and feedback is prioritized across all aspects of care. PSHMC has also stressed ongoing education and research to ensure that new opportunities are recognized and pursued.

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Two Years In: Major Successes to Date

The LionNet program was officially launched in July 2012 and in two years PSHMC and its spoke hospitals have realized impressive results with improved patient care, tPA administration rates far above the national average and spoke hospitals becoming primary stroke centers.

- **Improved acute ischemic stroke treatment rates:** The national tPA administration rates for hospitals vary, on average, from 5 to 10 percent. In its first two years, the LionNet program has treated 29 percent of acute ischemic stroke patients – far above the national average.

- **Increased tPA administration and frequency of onsite care:** At some of the partner hospitals, tPA administration grew by a whopping 500 percent. Many of the hospitals that had never before treated stroke patients are now doing so and are increasingly comfortable with onsite stroke care.

- **Steady decrease in transfer rates:** In the past year, LionNet has seen transfer rates decrease from 40 percent to 25 percent. Dr. Reichwein attributes this to spoke sites becoming more comfortable with treating and keeping stroke patients.

In just two years, the program doubled the number of partner sites and increased the number of consults by 345%.

- **Decreased door-to-consultant and door-to-needle times:** National guidelines state that patients eligible for tPA should be treated within 60 minutes of arrival. Keeping this in mind, PSHMC has established a door-to-registration rate (arrival to cart activation) of 10 minutes. The registration-to-consult time is no longer than 20 minutes, and the decision to treat with tPA is made in less than an hour. Some spoke hospitals have even been able to shave 20 minutes from their door-to-needle time.

- **Spokes becoming primary stroke centers:** Valuing its spoke sites as partners, PSHMC is working closely with them to become primary stroke centers of their own. In fact, two spoke sites have achieved this goal within the past year.

Future Plans for LionNet

Penn State Hershey's LionNet telestroke program operates as part of the hospital's Neuroscience Institute – a world-class research facility that provides follow-up care and rehabilitation for stroke patients. Studies show that stroke patients fare best when they receive regular examinations within the first few months following a stroke. But as with acute stroke care, many rural hospitals lack the resources or expertise to provide the appropriate follow-up care. Penn State Hershey plans to expand their use of the REACH Access telemedicine platform to extend stroke follow-up care to multiple treating sites through its stroke teleclinic and stroke telerehab programs.

Stroke Teleclinic Program
Once a stroke patient has been stabilized, he or she often needs subsequent examinations, therapy or other care. The stroke teleclinic program will focus on stroke patients' follow up care, both in the treating facility and following release. The PSHMC neurologists will be able conduct initial follow up exams, reviewing patient vitals and providing a recommendation for when the patient can be released. Many patients will also need checkups at 30, 60 and 90 days after the stroke. The stroke teleclinic program will facilitate treatment through hospitals, community paramedicine and home visits.

Stroke Telerehab Program
Stroke patients in Pennsylvania often receive inconsistent rehab care, which can have a profound impact on quality of life following a stroke. The stroke telerehab program will focus on identifying, evaluating and providing optimal care to treat any stroke-related deficits in speech, mobility and cognitive function. The telerehab program will include collaboration between stroke neurologists, psychiatrists and neuropsychologists.

One focus of the teleclinic and telerehab programs will be the careful study and documentation of patient outcomes, ultimately providing rich data to further improve stroke care.

For similar telemedicine resources, please visit reachhealth.com/resources.

Best Practices for Developing a Telemedicine Network

If your hospital is considering a telemedicine system, PSHMC has identified several best practices to employ while getting underway. These tips have been used – and proven – within PSHMC and will help ensure that your organization starts off its telemedicine journey on the right foot.

- **Secure organizational support and define your vision:** According to Dr. Reichwein, without dedicated hospital administrative support and a vision for the design of your program, it is very difficult to be successful. Establish a group of internal stakeholders (medical directors, EMS, physicians, coordinators, etc.) to develop a clear vision, mission and goals that work for all those involved. The collaboration and time spent on this foundation will pay off in the long run.

- **Take the time to find the right technology partner:** The telemedicine space is crowded with vendors claiming to do it all. Yet their technology is often not user friendly, requires multiple components and is rarely scalable for easy expansion into new sites and service lines. Take the time to do your research and ask peers in the industry for recommendations. PSHMC chose REACH Health because the company offered a single, scalable platform that had everything it needed. Doctors could perform an entire consult with just one tool. Once your vendor is selected, ensure that it becomes an integral part of your stakeholder group and that it acts as a partner throughout planning, implementation and beyond.

- **Set the foundation:** Your telemedicine network will not succeed if the hub site is not ready to support a wide variety of requirements among the spoke hospitals. PSHMC spent a year preparing its infrastructure and defining internal and external pathways and protocols. All the pieces must be solidly in place at the hub site before you can offer optimal guidance, support and expertise to your partners.

- **Create a team approach with spokes:** Too often, potential spoke sites shy away from telemedicine networks because they think that they will not have a voice or that the hub will take revenue away from their organization. Look to your spoke sites as value-added partners. Encourage a team-based approach to planning and implementation, stay present even after the system is up and running with regular visits and encourage two-way communication and feedback throughout.

- **Emphasize the importance of time:** Anyone who takes care of stroke patients knows that "time is brain." Telestroke consultations must be conducted in a timely fashion to ensure the best possible outcomes. It is critical that you emphasize and reemphasize the importance of staying on schedule to everyone involved in the program – regardless of whether they work at the hub or spoke sites. Facilitate a mindset of continuous improvement - use the statistical data from your telemedicine system to provide candid feedback and coaching to the spoke hospitals.

- **Don't forget the importance of education:** Community education is critical to the success of any telemedicine program – especially in acute, time-based areas such as stroke care. Establish a community education plan that communicates the signs and symptoms of strokes, offers information on the urgent treatments available and conveys the importance of time. This education program should be ongoing and refined as your telemedicine network evolves and should include EMS and the local public at large.

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