



Market Innovation Center

Telehealth Primer: Teleneurology

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Project in Brief



The following report describes telehealth market trends oriented around neurology care delivery. The analysis is designed for use by program or strategic leadership in health care provider organizations interested in exploring telehealth opportunities.

The brief includes definition of key terms, discussion of investment considerations, and a sample case study from a leading health care organization with an established teleneurology program.

Want to learn more?



For additional resources and custom assessments relating to telehealth strategy, implementation, and evaluation, please contact your Dedicated Advisor.

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Access, Capacity Strains Driving Teleneurology Adoption

What is teleneurology?

Teleneurology refers to the remote treatment and diagnosis of neurological conditions. Telestroke was the first teleneurology application, developed to improve timeliness of care for hospitals with limited or no in-house neurology coverage. Telestroke's initial success has led to widespread adoption of the technology, resulting in the development of regional "hub and spoke" telestroke networks across the nation.

More recently, telemedicine has been used to support evolving neurology care needs across the full patient care continuum, from patient triage, to remote monitoring in the neuro-ICU, to chronic management of patients with degenerative diseases such as movement or memory disorders.

Key Teleneurology Applications



Non-Acute Triage and Diagnosis



Acute and Emergency Care



Inpatient Care



Outpatient and Follow-Up Care

What are the emerging trends that are driving teleneurology adoption?



Provider Shortages

National shortage of neurologists brings capacity constraints and challenges provider efforts to meet growing community demand for services

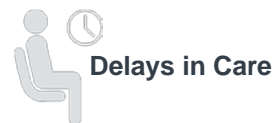
▶ **19%**
Projected shortfall from neurologist demand in 2025¹



Unequal Service Distribution

Neurology offerings often not available locally, particularly in rural areas, requiring patients to travel for acute services and chronic care management

▶ **11.02 vs. 1.78**
Neurologists per 100,000 people in Washington DC vs. Wyoming²



Delays in Care

Access issues lead to delays in care which can decrease patient satisfaction and be potentially detrimental for advanced or emergency patients

▶ **76%**
Percent of patients who prioritize access to care over need for human interaction with providers³



How is teleneurology reimbursed?

Reimbursement is commonly cited as one of the key barriers to teleneurology implementation. While CMS does offer limited reimbursement for services provided in health professional shortage areas (HPSAs), most teleneurology providers seek alternate funding sources beyond traditional reimbursement.

One common funding source that has gained popularity is a direct contract model between hub and spoke sites. These contracts are typically structured as a subscription fee or per-consult payment. Per-consult fees can also be implemented for direct-to-patient teleneurology services, similar to a copay.

In addition to direct contracting, many teleneurology providers seek alternate funding through federal, state, or private foundation grants. Philanthropic funding can also help make investment in teleneurology services more financially viable, though many universities and health systems fund teleneurology programs directly in order to tap into the associated clinical and operational benefits.

1) Dall et al. 2013.
2) Avitzur, O. 2010.
3) Aston, G.
4) Silva et al. 2012.

Sources: Dall et al. Supply and demand analysis of the current and future US neurology workforce. *Neurology*. 2013; 81(5):470-478; Avitzur, O. Practice Management in Neurology. *Neurologic Clinics*. 2010; 28:537-561; Aston, G. Telehealth Promises to Reshape Health Care. *Hospitals & Health Networks*; Silva, GS et al. A Survey of Currently Active Stroke Telemedicine Programs. *Stroke*. 2012. 43(8):2078-85; Market Innovation Center interviews and analysis.

Clinical, Operational Benefits Top Value Proposition

What is the business case for teleneurology services?

Teleneurology coverage is a lower cost option for spoke facilities when compared to maintaining in-house neurology coverage. Spoke facilities also report increased revenue as a result of increased patient retention instead of transferring patients for treatment. Other benefits include improved diagnosis rates, reduced length of stay, and reduced complications and readmissions.





Telestroke hubs that offer neurointerventional services are able to identify a higher volume of interventional stroke candidates through spoke facilities, though many of the benefits at hub sites are less directly measurable. While actual provision of services can accrue costs, the partnerships that teleneurology hubs form with other facilities help establish the hub as a regional neuroscience center. This is associated with increased referrals, not just from network partners, but other local physician and patient self-referrals as well. Many of the up-front costs can also be defrayed by efficiency gains and reduced staffing and operational costs for in-person services.

Teleneurology services also provide community benefits, supporting population health efforts. In addition to increased access to services, teleneurology is associated with an increase in acute patients discharged directly to home, alleviating backlog at rehabilitation and nursing facilities. These incremental health care benefits result in cost savings for providers, payers, and patients alike.

75%
Increase in IV-tPA utilization within 8 months of initiating pilot telestroke program in Northern Wisconsin¹

60-70%
Average patient retention of active teleneurology networks following telemedicine consultations²

\$358K
Estimated average cost savings per year for an 8-hospital telestroke network³

VALUE PROPOSITION	HEALTH SYSTEM CHALLENGE	TELENEUROLOGY STRATEGIC BENEFIT
 Clinical Outcomes	Delays in diagnosis and treatment exacerbate patient conditions	▶ Improves timeliness of care, reducing average patient complexity and supporting effective treatment of stroke and other emergent patients
 Provider Efficiency	Staffing shortages challenge capacity and increase travel time for physicians providing call coverage	▶ Remote consults allow providers to more efficiently triage and diagnose patients, expanding capacity for additional cases
 Patient Access	Travel requirements place undue burden on patients, particularly for those seeking chronic care management	▶ Remote triage and follow-up care reduce patient travel time and expenses, resulting in increased access and patient satisfaction
 Program Regionalization	Local competitors challenge market share and can limit program expansion opportunities	▶ Developing a teleneurology network expands geographic reach of program, creating partnerships and garnering referrals

Where can I learn more on this topic?

- Related content from Service Line Strategy Advisor: [“Key Considerations for Teleneurology Expansion”](#)
- Related content from the Market Innovation Center: [“Telehealth Industry Trends for 2016”](#)
- Related content from Service Line Strategy Advisor: [“Addressing the Neuroscience Physician Shortage”](#)

1) Kartje et al. 2015.
2) Demaerschalk, BM et al. 2009.
3) Switzer et al. 2013.


Sources: Kartje, R, et al. Improvement in Rates of Thrombolytic Therapy in Acute Stroke by a Telestroke Program in Rural Northern Wisconsin (P1, 011). *Neurology*. 2015. P1-011; Demaerschalk BM, et al. Stroke telemedicine. *Mayo Clinic Proc*. 2009. 84:53-64; Switzer JA, et al. Cost-Effectiveness of Hub-and-Spoke Telestroke Networks for the Management of Acute Ischemic Stroke From the Hospitals' Perspectives. *Circ Cardiovasc Qual Outcomes*. 2013. 6(1):18-26; Market Innovation Center interviews and analysis.

Teleneurology Relieves Regional Coverage Deficiencies

Kobi Health¹, located in the southeastern United States, first launched its teleneurology program in February 2014 with the goal of increasing regional access to neuroscience expertise. The program was created as a resource-efficient response to affiliate hospital requests for neurology coverage.

Kobi provides 24/7 general neurology coverage to partner hospitals for ED and inpatient cases. Top diagnoses seen through the program include stroke, seizure, headache, and loss of consciousness. Kobi's choice to expand coverage beyond telestroke revealed a significant community need and helped grow the program, as evidenced by the fact that nearly 60% of calls received are for non-stroke patients.

Program leaders attribute much of their initial success to staffing the program with nine employed neurologists, citing the importance of physician alignment and engagement.



Case in Brief: Kobi Teleneurology Program¹

- Teleneurology network consists of 9 employed neurologists providing general ED and inpatient neurology coverage to 7 spoke sites across the southeastern United States
- Hub-and-spoke network created to improve regional access to neurology expertise, with the goal of allowing spoke hospitals to treat neuroscience patients in-house
- Network has improved timeliness of care, bolstered patient outcomes, and strengthened partnerships with regional facilities

Key Features of Kobi Teleneurology Program



Broad Scope of Services

Kobi offers 24/7 teleneurology support for all neurological cases in the ED or general inpatient setting



Clinical Champions

Inpatient and ED champions at each site guide partnership, enforce protocols, and facilitate staff buy-in and training



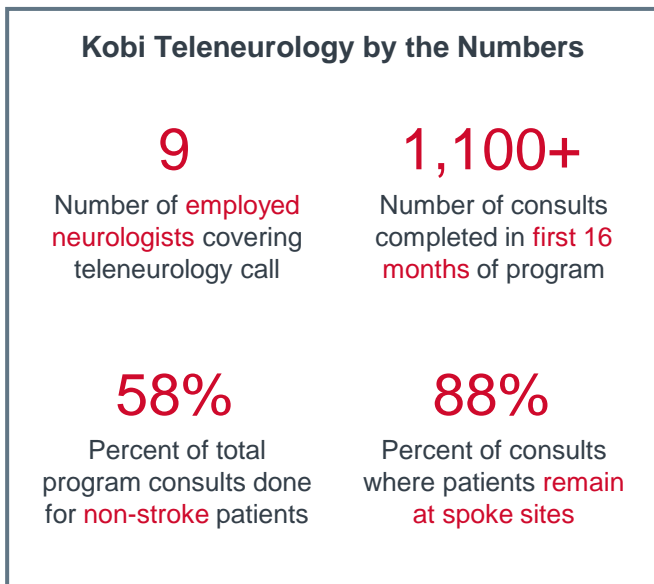
Easy-to-Use Technology

Physicians carry iPads and hot spots, bolstered by contingency plans to address any technological difficulties that may arise



Training and Support

Physician and nurse training includes technical support for iPads, imaging system, and interfacing with EHR platform



Spoke sites report a number of benefits to the teleneurology partnership, including improved patient outcomes, fewer patient transfers or instances of EMS bypass, and a reduced length of stay of up to 1-2 days for neurology patients. One spoke hospital initially partnered with Kobi as a way to start accepting neurology patients. Within 6 months, they were able to independently treat stroke patients while using the teleneurology service only as a back-up when needed.

The teleneurology program has been so successful, Kobi leadership hasn't had to do any outreach to recruit new partners – in fact, several hospitals have approached them with an interest in joining the network. Leaders of Kobi's broader telehealth program noted that the teleneurology process is highly scalable to non-neurology applications as well, and are evaluating expansion to other services including telebehavioral health and tele-endocrinology.

¹) Pseudonym.

Source: Market Innovation Center interviews and analysis.



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