



Developing an Economically Sustainable Telestroke Reimbursement Policy

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Researcher Background and Study Contributions



- Acute ischemic “stroke is one of the leading causes of morbidity and mortality worldwide. In the industrial countries, stroke is the third largest cause of death after cardiovascular diseases and cancer, and a major factor in permanent disability” (Johansson & Wild, 2010, p. 149).
- The researcher lost several friends and relatives to stroke attacks
- The researcher worked in Medical Device for 20 years saving peoples lives everyday.
- The study contributes to the University of Phoenix Scholar, Practitioner, and Leadership (SPL) model
- The study significantly contributes to helping stroke victims

The Problem



- The Telestroke (TS) telemedicine application adoption rate has been below industry expectations since the application became a recognized acute ischemic stroke (AIS) tool in the late 1990s.
- Two financially related factors are attributed to the slow adoption rate:
 - (a) the lack of a credible economic evaluation
 - (b) the lack of sustainable public and private funding.
- Several researchers argue the consistent and sustainable national telestroke reimbursement policy need. “Greater diffusion and long-term sustainability of Telestroke systems will be dependent upon improvements in patient and hospital reimbursement for acute stroke and Telestroke care” ([Switzer, Levine, & Hess, 2009, p. 323](#)).
- “The cost-effectiveness of Telestroke suggests that insurance plans should include urgent Telestroke consultation as a covered benefit, particularly because the lack of uniform reimbursement is a current barrier to adoption of the technology” ([Nelson, Saltzman, Skalabrin, Demaerschalk, & Majersik, 2011, p. 1596](#)).
- “The lack of consistent insurance reimbursement has been a financial barrier in terms of deployment and sustainability of telemedicine programs” ([Hooshmand, 2010, p. 5](#)).

The Problem Statement



- The general problem is TS's slow adoption rate and the adoption rate effect on treating AIS patients. The TS application provides expert neurological expertise to remote and stroke-skill challenged hospitals to use the only FDA approved treatment rt-PA. "Intravenous thrombolysis with recombinant tissue plasminogen activator (rt-PA) within 3 h[ours] of symptom onset is currently the only approved for treatment of acute ischemic stroke" ([Sylaja & Demchuk, 2008, p. S24](#)).
- The specific problem is current TS reimbursement rates do not sustain current TS networks. Current TS reimbursement policy does not provide proper incentives and rewards to TS users and suppliers to encourage TS technology's growth and increased rt-PA use. The lack of TS reimbursement payments limit TS use resulting in less potential life-saving rt-PA procedures. "If barriers to use such as low reimbursement rates and high equipment costs are reduced, Telestroke has the potential to diminish the striking geographic disparities of acute stroke care in the United States" ([Nelson et al., 2011, p. 1590](#)).

Purpose of the Study



- The study's purpose is understanding the barriers to developing a consistent economically sustainable National Telestroke Reimbursement Policy and proposing sustainable solutions.
- The study's purpose is to develop financially-sustainable proposals that assist hospitals, clinics, and physicians to obtain public and private Telestroke reimbursement to sustain and grow Telestroke Networks.
- The study's purpose is to increase Telestroke Network Growth to support the use of the only FDA-approved Ischemic Stroke treatment, Alteplase.

Research Questions



Research Focused on Research Questions

- What are the issues that enable enacting an economically sustainable Telestroke Reimbursement Policy in the United States?

Research Sub-Questions.

- R₁: What is the relationship between telestroke reimbursement rates and telestroke use?
- R₂: What are the key required sustainable telestroke reimbursement functional relationships?
- R₃: What are the elements of an economically sustainable telestroke reimbursement policy?
- R₄: What are the barriers to developing an economically sustainable and consistent telestroke reimbursement policy?
- R₅: What innovative reimbursement concepts, methods, and practices are practical to develop sustainable policy

Literature Review



- In 1999 researchers Levine and Gorman developed the germinal Telestroke research based on leveraging a tPA study concluding the effective tPA treatment time is three hours. Levine and Gorman argued a sense of urgency was required to cut the time from stroke onset to tPA delivery. They decided improving technology was the best solution and coined the term Telestroke.
- Confirms Telestroke technology as an important tool for administering the only FDA approved AIS treatment, rt-PA.
- Confirms the need for increased reimbursement funding to create sustainability.
- Details that most Telestroke networks start using both public and private grants and external funds. Confirms both public and private grants are decreasing and most Telestroke networks will rely on increased reimbursement funding to sustain services
- Documents federal legislative telemedicine reimbursement policies that provide the basis of physician's and hospital reimbursement payments.
- Documents the current legislation does not provide long-term sustainable TS reimbursement.
- Confirms stroke treatment complexities, economic evaluation ambiguity, and public and private legislation complicate Telestroke reimbursement policy.

Methodology



- The Purpose Statement defines the study's research method as qualitative supporting the study's inquisitive type research questions to create new Telestroke reimbursement knowledge.
- The study leverages two hybrid Delphi models, the Policy Delphi and e-Delphi methods.
 - The Policy Delphi method incorporates investigative statistical and qualitative methods creating a prioritized issues/solutions list.
 - The e-Delphi method is Website based and reduces the Policy Delphi' three discussion rounds cycle time, online flexibility, convenience, and communication advantages.
- The participant quality, reputation, and selection criterion are critical to the Policy Delphi process to maintain study results validity. The participant selection pool focused on select Telestroke experienced neurologists with Telestroke research credentials.
- The Policy Delphi differs from the classic Delphi process because the Policy Delphi's output is to generate strong opposing views to the potential policy resolutions. The policy Delphi is not intended to generate classic Delphi consensus but intended to focus on prioritizing policy options and alternatives.

Research Execution



The research started with a three-round pilot ensuring the Policy e-Delphi process executed flawlessly. The pilot identified the need for additional question clarity and provided e-Delphi process experience preventing actual research delays and confusion.

The participant selection, notification, and consent signatures were completed before the study commenced.

Each Policy e-Delphi round was executed the following the Policy Delphi and e-Delphi design guidelines and standards documented in Chapter 3.

Statistical and qualitative analysis was critical to selecting the Round 1 and 2 reimbursement issues and Round 3 most significant Telestroke policy solutions.

The researcher utilized NVivo Qualitative Software to explore the participants' qualitative comments to support the statistical results and search for additional participant-based trends and patterns.

The Round 3 Feasibility and Effectiveness Index prioritized the proposed solutions based on the potential policies' financial contribution maximization and minimum implementation resistance.

Major Findings



The Feasibility and Effectiveness Index's top five policies are:

- Leverage Federal Reimbursement Policies to enlarge the telestroke reimbursement policy scope to provide reimbursement for all areas including outside of an identified rural health professional shortage area or a county that is included in a Metropolitan Statistical Area (MSA).
- Incorporate in Federal Legislation a telestroke reimbursement policy providing reimbursement billed on an hourly basis for neurologists. Include reimbursement for standard locality-adjusted on-call stipends for neurologists responding to telestroke service requests.
- Leverage Federal Legislation to provide reimbursement for telestroke use based on best and cost effective telestroke practices, proven care methods, and demonstrated improvement in stroke care quality and efficiency.
- Incorporate in Federal Reimbursement Policies a telestroke reimbursement policy providing reimbursement for all costs related to telestroke use including technology, technical support, surgical, medical, clinical and critical care, neurologist, laboratory, pharmacy, therapy, and administrative costs.
- Leverage Federal Reimbursement Policies to include a telestroke reimbursement policy requiring a consistent and stable combination of federal, state, and private health insurers to reimburse telestroke activities at a financially-sustainable level. Include a telestroke reimbursement policy requiring federal and state reimbursements to be the same rate as face-to-face stroke-related services.

Study Practical Implications



- Financially-sustainable Telestroke reimbursement enables:
 - Reduced AIS patient diagnosis enabling increased use of rTPA. (three – four and a half hour time limit)
 - Increased Telestroke Network growth creating synergetic opportunities to link networks and systems.
 - Increased access to AIS specialized neurologists especially in rural areas.
 - Increased use of tissue plasminogen activator (tPA). Early treatment of ischemic stroke with intravenous tissue plasminogen activator (tPA) reduces
 - Neurological impairment and disability,
 - length of hospital stay,
 - percentage of patients going to rehabilitation and nursing homes
 - Health care cost effectiveness – Canada could save \$15.4 billion directly and avoid \$20.7 billion in indirect costs between 2011 and 2031 by increasing Telestroke use (Kondro, 2011).
 - Increased opportunities for AIS research collaboration

Study Limitations



- The Delphi participant panel size.
 - The study incorporated 8 participants and most Delphi panel guidelines recommend 10
 - Lack of Telestroke reimbursement experts on the panel.
- Focused on United States Policy and Reimbursement.
 - Did not investigate other foreign Telestroke financing that could be incorporated in the United States
 - Did not include diverse participant participation from other countries.
- e-Delphi Perceptual Limitations.
 - The risk of influencing participants with median judgment.
 - Determining the point of adequate consensus
 - Attrition level
- Limited qualitative participant feedback and input.

Study Contributions



- Identified dozens of Telestroke reimbursement issues to take into consideration for policy improvement.
- Prioritized 10 potential policy recommendations based on financial contribution and implementation feasibility
- Demonstrated the combination of two Delphi designs can be successful.
- The study was written as a foundation for future research opportunities.

Applying Findings to the Study's Field



- The study brings a unique and important conclusions set (proposed policy recommendations) to the field.
- Creating a publishable paper
- Speaking at Telestroke and Telemedicine Conferences.
- Distributing the completed research to the well-qualified telestroke researching participants.
- Distributing the completed research to United States and select State Legislators

Study's Research Application to the Scholar, Practitioner, and Leadership (SPL) Model



- The School of Advanced Studies' mission is to develop leaders to create explainable and predictable models that improve organizational performance. The model focuses on three areas, developing solid research as a foundation to influence policy decisions and leading organizations to create effective decision-making.
- This study follows Levine and Gorman's germinal work to create a renewed sense of urgency to expand and improve Telestroke networks and technology.
- This study creates a real-world business case for the need to expand the Telestroke application.
- This study contributes to taking the Telestroke application to the next step from a medical expertise model to a business leadership model.
- This study examines the complex Telestroke reimbursement environment and derived a set of prioritized policy recommendations.
- The study developed high quality conclusions and recommendations with publishable possibilities.

Future Scholarship Opportunities



- Increasing the “number of well-designed telestroke studies, particularly in rural settings. There is a need for well-designed randomized controlled trials and longitudinal observational studies of clinical outcomes to demonstrate the effective use of telemedicine in stroke survivors discharged from hospital” ([Joubert et al., 2009, p. 34](#)).
- Further research telestroke’s cost-effectiveness “to evaluate how the volume of telestroke systems, number of patients treated, and methods and distance of transportation affect the incremental cost-effectiveness ratios.”([Nelson et al., 2011, p. 1596](#))
- Determine TS hub and spoke distance thresholds “to identify the distance thresholds that affect the cost-effectiveness of telestroke ... to determine whether their health system’s particular characteristics support telestroke as a cost-effective solution”. ([Nelson et al., 2011, p. 1596](#))

Future Scholarship Opportunities (con't)



- Research possible TS network enhancements by including advanced *Computed Tomography* (CT) and *Magnetic Resonance Imaging* (MRI) technology and to potentially increase the number of patients referred to tertiary stroke centers for intra-arterial therapies” ([Henninger et al., 2009, p. 25](#)).
- Research the cost effectiveness of “ Being at home after a stroke instead of being permanently in a nursing home[. It] has a huge impact on patients, their families, and reduces the economic burden of stroke on the society: ([Tatlisumak et al., 2009, p. 25](#))
- Research TS networking effects on establishing and maintaining stroke units and stroke teams in spoke hospitals combining dedicated stroke care, quality management, and a telemedicine consultation service ([Tatlisumak et al., 2009, p. 25](#))
- Research the TS networking effect on helping “rural hospitals to recruit young physicians for their emergency services. It also increases the attractiveness of neurology as a field of specialization among newly graduated doctors” ([Tatlisumak et al., 2009, p. 25](#)).

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