Second National Doctors of Nursing Practice Conference: Defining Ourselves

Blunt Cerebrovascular Injuries : A Systems Analysis at a Tertiary Care Center

Deborah L. Schofield, DNP,CRNP

NP Program Manager, Clinical Specialties

Assistant Professor, University of Maryland Medical Center, University of Maryland School of Nursing

Baltimore, Maryland

Acknowledgments: Capstone Committee

- Joan Davenport, RN, PhD- Chair. Assistant Professor, University of Maryland Medical Center, Baltimore.
- Q. Kay Blum, CRNP, PhD. Assistant Professor, University of Maryland School of Nursing, Baltimore.
- Barney Stern, M.D. Professor and Chair, Brain Attack Team, Vascular Neurology, University of Maryland Medical Center, Baltimore.
- Karen Yarbrough, M.S., CRNP. Program Manager, Vascular Neurology, University of Maryland Medical Center, Baltimore.

Presentation Objectives and Learner Outcomes

Goal

- Explication of a systems approach to addressing an existing gap in quality of care to a patient population using Rogers (2003) "Diffusion of Innovation "Theory.

- Participant Objectives
  - State 2 recommendations from Institute of Medicine (IOM, 2004) on bridging the gaps in healthcare quality and access across populations.
  - Identify 2 barriers to changing practice in complex systems such as hospitals.
  - Identify 2 stakeholder groups to consider when designing systems change.

Background

- Strokes are 3rd leading cause of death and disability in the U.S currently.
- BCVIs (blunt cervical vessel injuries) are among the leading cause of ischemic strokes in adults 45 years and younger.
- Incidence in U.S.: 1.7 to 3.0 per 100,00 patients per year
- BCVI mortality and morbidity

Blunt carotid artery injury grading scale Injury Grade and Description

I Luminal irregularity or dissection with <25% luminal narrowing

II Dissection or intramural hematoma with > 25% luminal narrowing Intraluminal thrombus, or raised intimal flap.

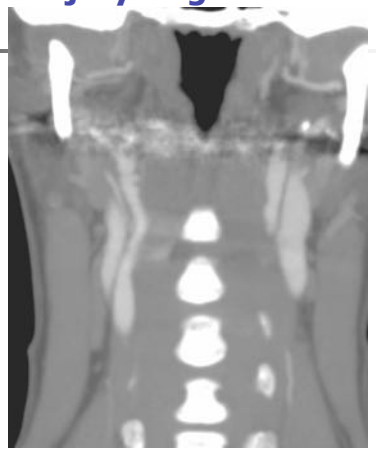
III Pseudoaneurysm

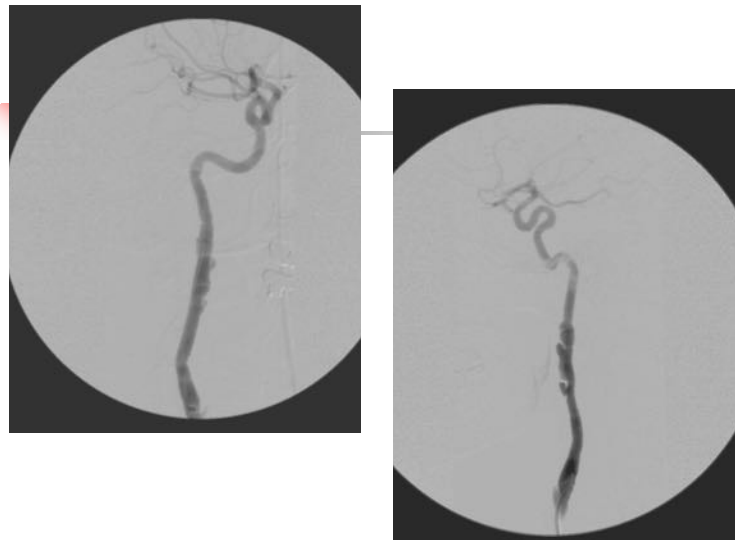
IV Occlusion

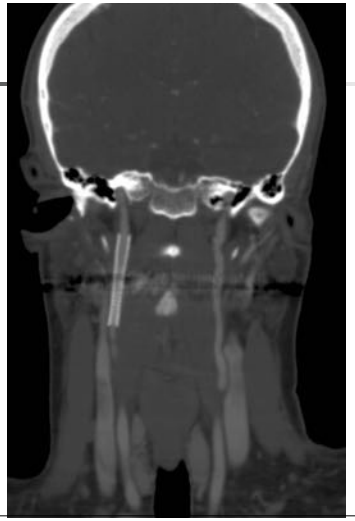
V Transection with free extravasation

Biffle 1999

Grade 3 Injury: Right ICA







Background

- Blunt cerebrovascular injuries recognized at much greater frequencies
- STC NP and MD concern for lack of clear plans of follow-up care for BCVI patients
- Investigator's anecdotal experience of fragmented care for this population.

Background: Retrospective chart review findings: 2004-2007

- BCVIs grades 1-3 meeting criteria: 97
- Treatment trends: Relatively consistent
- 39% (38 patients) were lost to follow-up

Literature Review: Screening and Treatment guidelines

- Aggressive screening protocol (Sliker & Mirvis, 2007)
- Optimal initial and post-BCVI management is controversial in literature
- Expert panel consensus guidelines (Sacco et al., 2006) and Trauma Practice Guidelines (Bromberg et al., 2007)

Treatment Modalities

- Antiplatelet agents
- Anticoagulants
- Combined therapies
- Stenting
- Coil embolization
- Intravenous or intra-arterial thrombolysis

Literature Review

- Reports of delayed ischemic events (Biffl et al., 2002)
- Multidisciplinary approach to BCVI treatment in 3 of 4 urban, level 1 trauma centers.

Statement of the Problem

39% of patients diagnosed with grades 1-3 BCVIs were lost to follow-up at STC/UMMC in interval years 2004-2007. There is no clear documentation of guideline-driven management of these patients in the system. This project was to develop a strategy using currently available resources to decrease the number of patients lost to follow-up and increase documentation of guideline-based management

Significance

- BCVIs have been observed to progress from 2 weeks to 6 months post diagnosis. (Biffl et al., 2002)
- All of these patients were discharged on medications which placed them at risk for strokes or hemorrhagic complications.

Project Purpose and Performance Measures

Primary Purpose:

- To diminish the 39% lost to follow-up rate.

Secondary Purposes:

- Increase patient teaching related to stroke symptoms
- Medication compliance documentation.
- Neurologic exams on follow-up.

The Theoretical Framework: Rogers Innovation-Diffusion Theory

The Change Agent

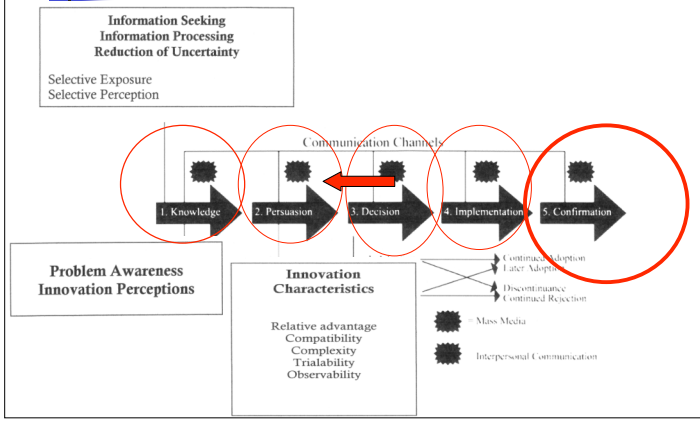
The Opinion Leader

5 stages:

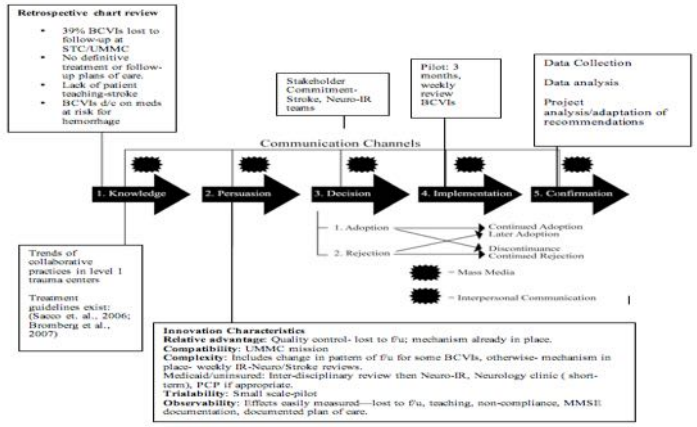
- Knowledge
- Persuasion
- Decision
- Implementation
- Confirmation

Innovation – Decision Process

Model of Stages in Decision Process

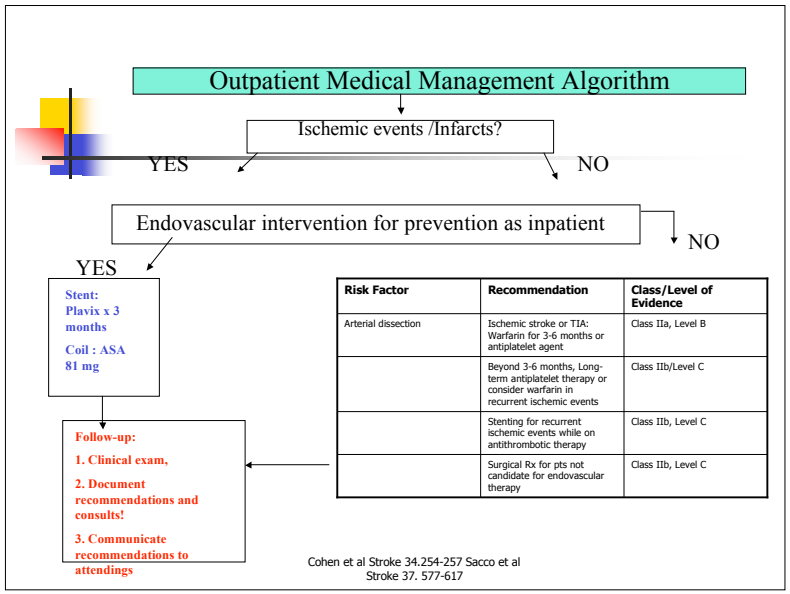


Theoretical Framework: Application of pilot (Rogers, 2003)



Pre-Implementation

- STC physician-Neuro-Critical Care discussions
- STC NP presentation
- Interventional Neuro presentation
- Multidisciplinary group presentation



Risk Factor	Recommendation	Class/Level of Evidence
Arterial dissection	Ischemic stroke or TIA: Warfarin for 3-6 months or antiplatelet agent	Class IIa, Level B
	Beyond 3-6 months, Long-term antiplatelet therapy or consider warfarin in recurrent ischemic events	Class IIb/Level C
	Stenting for recurrent ischemic events while on antithrombotic therapy	Class IIb, Level C
	Surgical Rx for pts not candidate for endovascular therapy	Class IIb, Level C

Cohen et al Stroke 34.254-257 Sacco et al Stroke 37. 577-617

Evidence-based algorithm

- Best existing medical evidence to treat BCVIs
- Additional provision of recommendations for BCVIs treated from endovascular standpoint
- Formal communication venue to implement innovation and to provide formal documentation of treatment with evidence-based recommendations.

Pilot Outcomes

- July 2008- Sept 2008
- 6 enrolled patients (one expired)
- 1 patient lost to follow-up
- All patients received inpatient stroke teaching
- All patients had a single plan of care for follow-up documented

Pilot Outcomes

- 4 males, 1 female
- Mean age 37.5 years (range 25-55)
- Three insured by third party payers (2 Medicaid)
- Two with Primary Care Providers

Analysis of process and outcomes

Multidisciplinary recommendation trends
Informal venues of referral and consultation
BCVIs followed by STC preferentially and by referral

Recommendations

STC stakeholders

Recommendations

Pre-implementation meetings

Recommendations

Shared electronic database

Recommendations

Documentation of formal referral and consultation

Recommendations

Invest in patient accountability

Recommendations

System-wide adoption of a reliable scale for neurologic and disability measurement.

Recommendations

Further study- : BCVI outcomes in context of multidisciplinary recommendations

Questions and Discussion