



Stroke Care in Maine

Analysis of All-Payer Claims
Data to Measure Quality of Care





PRESENTER DISCLOSURE INFORMATION

**Financial and off label use disclosures:
None**





Stroke Care in Maine Workgroup

- Started and spear headed by Danielle Louder of the Maine Cardiovascular Health Program - located within the Maine Center for Disease Control
- Consists of a variable group (physicians, nurses, administrators, EMS personnel, statisticians, and epidemiologists) from all regions of the state representing hospitals, rehabilitation centers, umbrella healthcare organizations, physician organizations, American Stroke Association and the Maine CDC
- Group meets via bi-monthly teleconference – prioritizes and implements efforts to enhance state-wide stroke systems of care
- January 2009 - started the project to analyze Maine's All-Payer Claims database as a source to measure stroke care and outcomes throughout the state



Purpose and Goals

- Only a handful of Maine's thirty-six acute care hospitals participate in stroke-specific data collection and quality improvement efforts:
 - Either JC Primary Stroke Certified and/or ASA Get With the Guidelines-Stroke participants
- Stroke Care in Maine Workgroup identified All-Payer Claims database as potential source of quality indicators

Goals - proof of concept:

- Determine whether claims data is a feasible source to measure stroke care in Maine
- Utilize data to establish a baseline measure of quality, identify gaps in care and plan future efforts



Data Sources

Maine Health Data Organization (MHDO): established by Maine Legislature in 1996 to collect clinical and financial healthcare information and exercise stewardship in making the data accessible to the public:

- Maine All-Claims Database: one of the oldest all-payer, all-claims databases in the nation, with a primary goal of creating consistency in collection standards, codes and methodology
- Maine Hospital Discharge data
- Maine death certificates - primary cause of death

Get With the Guidelines – Stroke: ASA Regional and Maine Hospital GWTG databases for comparison to claims results

➤ Maine All-Claims Stroke Analysis:

- A list of stroke specific data elements was submitted to the Maine Health Data Organization for analysis in Spring 2009
- Available data included all claims for private payers and Medicare, for patients with an admitting or primary diagnosis of cerebrovascular disease (ICD-9 430-436) for years 2003-2006, within all Maine hospitals (n=12,202)
- Data elements: stroke diagnosis, EMS use, diagnostic scans, use of thrombolytic therapy, neurological consultation, surgical procedures, length of stay, discharge medications, survival and mortality



ICD 9 Codes 430-436

- 430 Subarachnoid hemorrhage
- 431 Intracerebral hemorrhage
- 432 Non-traumatic subdural or extradural intracranial hemorrhage
- 433 Occlusion or stenosis of basilar, carotid, vertebral, multiple and bilateral precerebral, other specified or unspecified precerebral arteries with or without cerebral infarction
- 434 Cerebral artery occlusion, thrombotic or embolic
- 435 Transient cerebral ischemia
- 436 Acute but ill defined cerebrovascular disease



Problems with the Data

- Data did not include Medicaid (MaineCare) patients
- Inherent limitations of ICD-9 coding system
- Death is only recorded for those individuals who die in the hospital. Does not include home, hospice, or long term care mortalities.
- Pharmacy data included only commercial payers, and only for prescription medications, not allowing for accurate assessment of platelet anti aggregating medications
- Imaging data may be limited by submission of 3rd party billing for diagnostic tests like MRI or CT brain scans

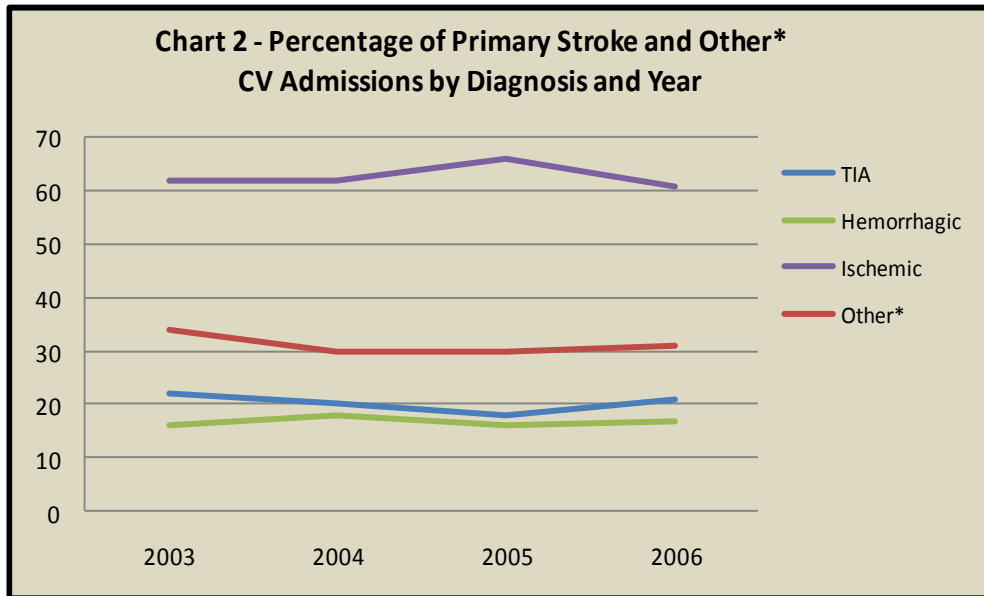


Results – Consistencies

- **Consistencies – Claims Data vs. GWTG-Stroke:**
 - State-wide distributions of stroke diagnoses, including gender and age demographics
 - Rates of ambulance use: State average around 56%, with wide variation among hospital service areas
 - Rates of tPA administration among ischemic admissions: in line with national average for 2006, and trending upward
 - LOS rates consistent between sources: Maine's average for ischemic and hemorrhagic lower than national, and may be on the decline
 - Mortality and Survival rates consistent between sources, with evidence of decreasing trends in mortality

Baseline Findings – Admission Types

Admission Trends



Patients stroke diagnosis at discharge
-63% had matching admitting and discharge diagnoses
- 27% had **non stroke diagnosis at time of admission (false negatives)**
- 10% had **incorrect stroke diagnosis at admission (false positives)**

Breakdown of Hemorrhagic Stroke Admissions:

Subarachnoid: 17.2%
Intracerebral: 60.3%
Other and unspecified Intracranial : 22.5%

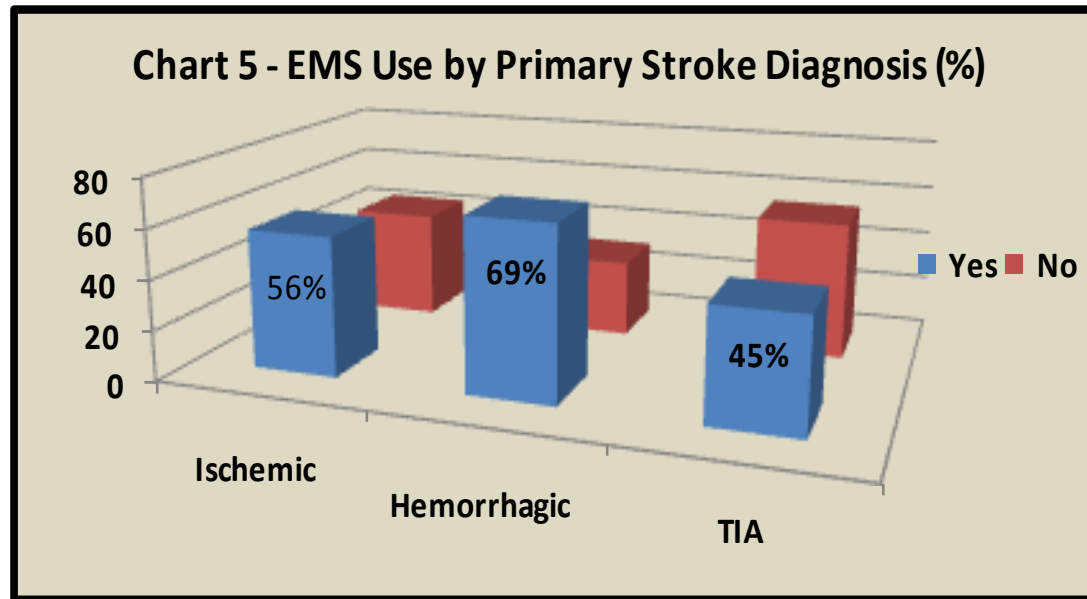
- Rates remained stable '03-'06 for all stroke types
- All stroke types more common in those aged 65+
- Hemorrhagic stroke most common type in those under 44 years
- Females had slightly higher rates for all types, but not significantly so

*Other includes: 1) Additional cerebrovascular categories: other and ill-defined cerebrovascular diagnoses, (including occlusion and stenosis of arteries) and late effects diagnoses, and 2) Non-cerebrovascular diagnoses categories: general symptoms and ill-defined conditions, injury and poisoning, nervous system conditions, and cardiovascular conditions.



Baseline Findings – Use of EMS

Use of EMS for Stroke

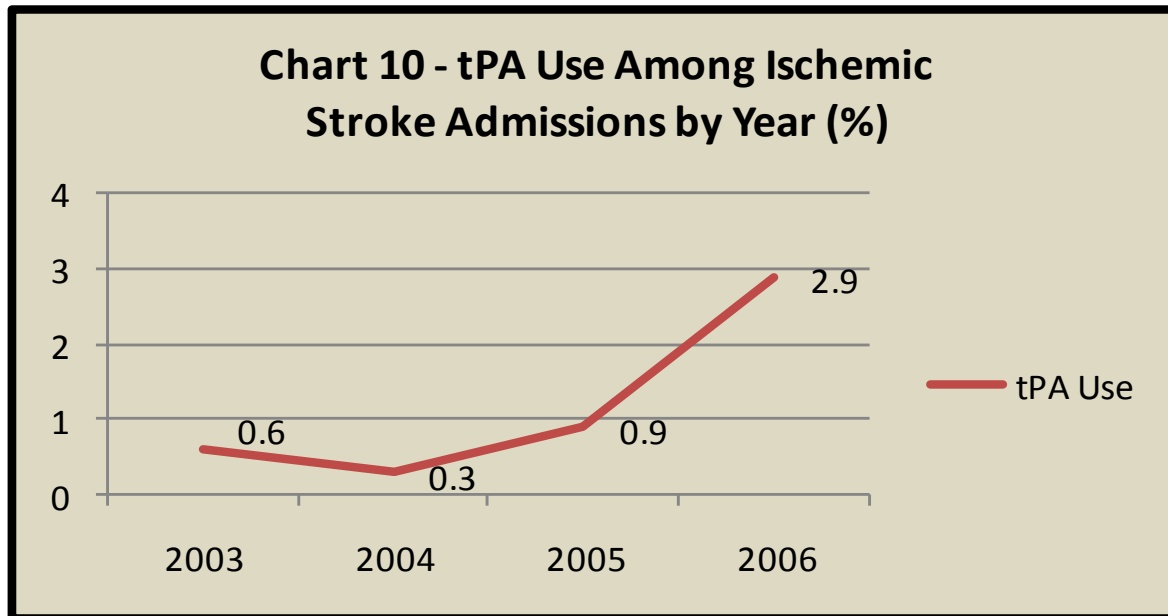


Hospital Service Area	Rate (%)
Portland	67.2
Bangor	54.6
Lewiston	49.4
Augusta	50.9
Waterville	59.2
Biddeford	62.6
PenBay	53.9
MidCoast	62.5
Franklin-Somerset	48.6
Aroostook	50.9
Oxford	47.5
Southern ME	50.0
Penobscot-Piscataquis	50.8
Downeast	60.5
Unspecified	46.9

- Evidence of overall decreasing trend over the four-year period 59% vs. 53%, due to precipitous decline in specific hospital service areas: Lewiston, Oxford, Franklin-Somerset and Penobscot
- Females slightly more likely to use EMS; Those aged 75+ significantly more likely to use EMS

Baseline Findings – tPA Use

Use of Thrombolytics



tPA Use by Age - 2006:

0-44 years: 10.3%

45-64 years: 1.9%

65-74 years: 4.0%

75+ years: 2.4%

tPA Use by Gender:

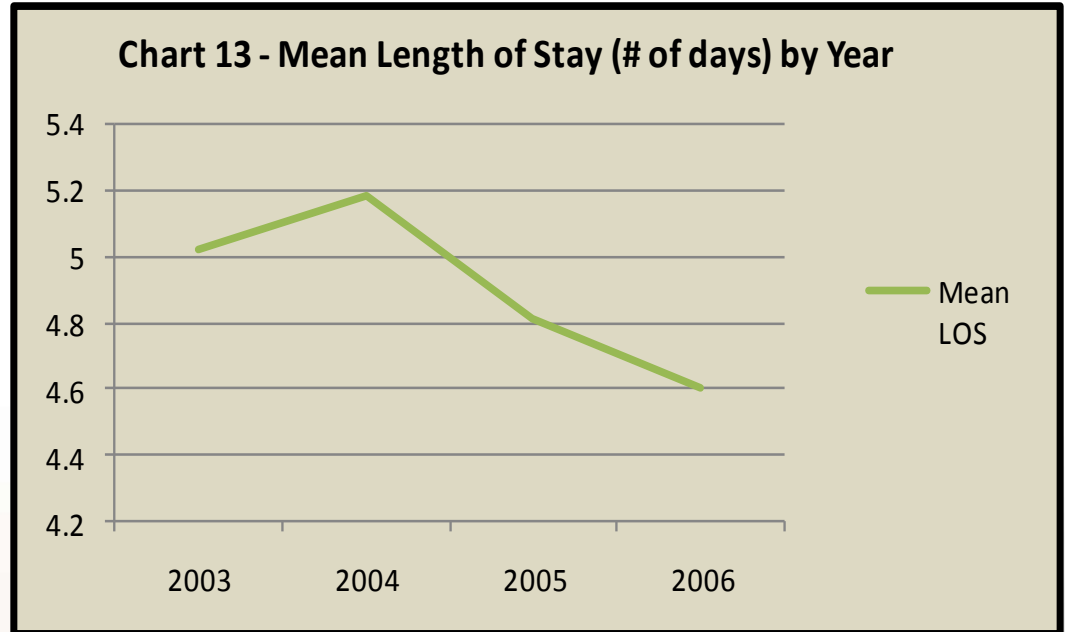
Females: 2.0%

Males : 3.9%

- Evidence of overall increasing trend over the four-year period with youngest age group significantly more likely to receive tPA
- No significant gender difference, but admissions in southern region significantly more likely to receive tPA – Portland (8.4%), PenBay (5.5%) and Southern Maine (4.1%) HSAs highest rates in 2006

Baseline Findings – Length of Stay

Mean Length of Stay



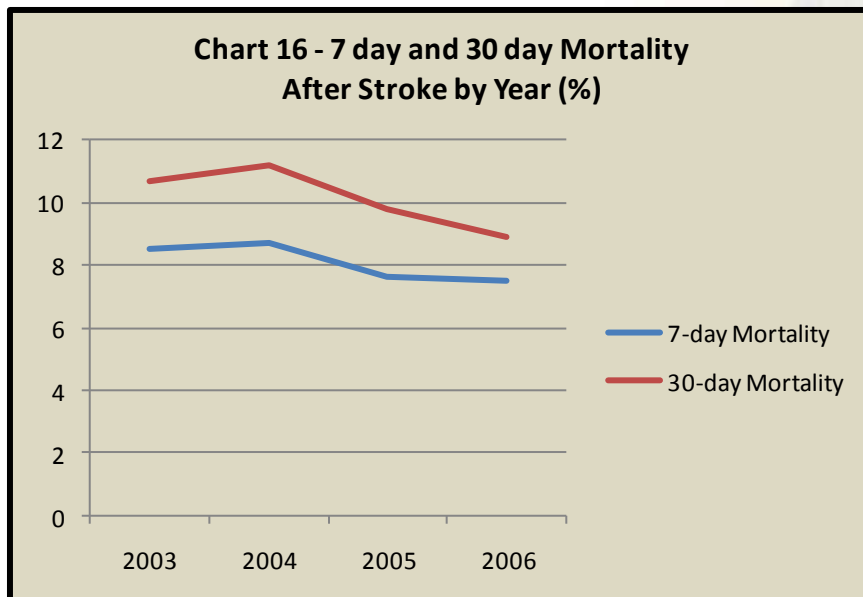
- Variation by stroke type as expected
- Mean LOS decreased with age - likely due to more hemorrhagic strokes in younger patients, and more deaths in older patients
- No significant variation by gender or region
- Maine mean LOS shorter than national average (6.2 days vs. 5.43 days in 2006)
 - This comparison includes only ischemic and hemorrhagic since national average does not include TIA



Baseline Findings - Mortality

Stroke Mortality

- Overall mortality rates decreasing over time, with significant decrease in mortality at one week and one month, between 2003 and 2006
- Mortality higher among older stroke admissions; highest rate in intracerebral hemorrhage admissions
- Significant difference in mortality rates in northern vs. southern regions, likely due to higher rates of TIA in north, and more hemorrhagic stroke in south



Stroke Mortality by Gender:

Females: 8.4% (7-day)
10.6% (30-day)

Males: 7.7% (7-day)
9.7% (30-day)

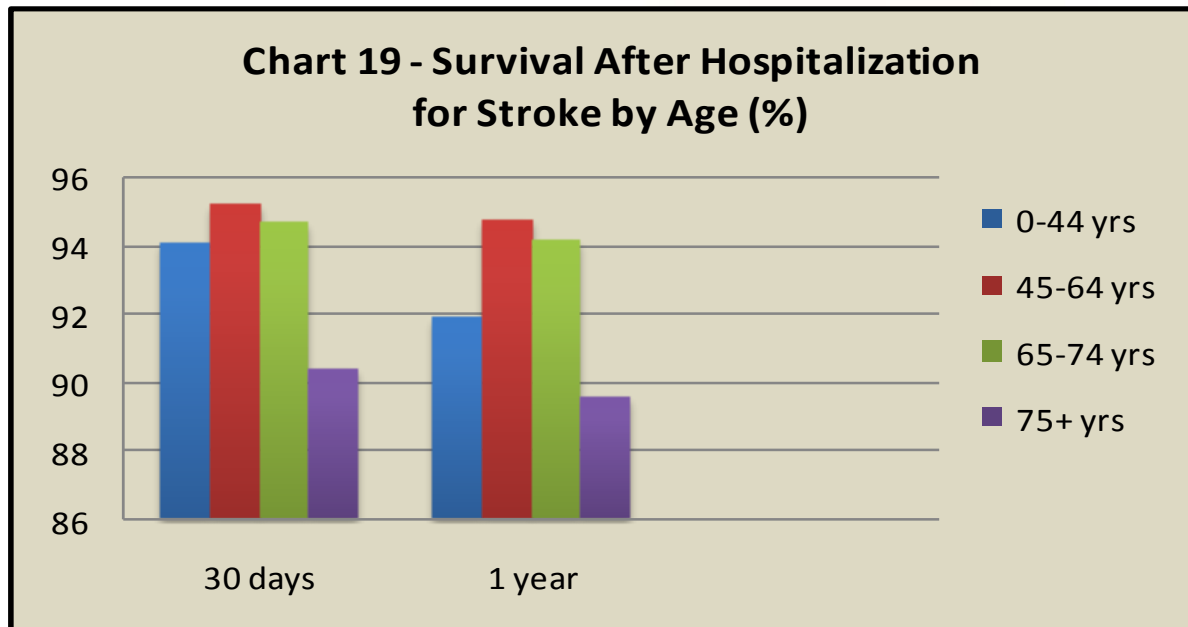
Stroke Mortality by Diagnosis:

	7 day	30 day
Ischemic:	6.1%	8.3%
Hemorrhagic:	25.0%	29.0%
TIA:	0.1%	0.1%

Baseline Findings – Survival

Survival

- Little decrease in survival from 30 days to one year
- No significant gender difference; significantly higher survival rates in northern region at 30 days, but not at one year





Results – Inconsistencies

- Inconsistencies – Claims Data vs. GWTG-Stroke:
 - Use of diagnostic studies
 - possible inconsistencies with coding of diagnostic tests/scans among sites
 - rates were lower than expected in claims data - consistently higher in GWTG databases
 - Neurological visits and surgical procedures – no comparable metrics collected in GWTG
 - Medications on discharge – rates were lower than expected and metrics did not correlate with GWTG measures



Baseline Findings - Diagnostics

Diagnostics – EKG, CT, MRI

- Significant variances in EKG rates, with those aged 65+ most likely to receive and females slightly more likely to receive
- Evidence of decreasing trend over time, with more decline in northern region
- Rates of CT and MRI unexpectedly low: less than 50% for CT, with significantly lower rates among younger admissions

Chart 6 - Diagnostic Testing by Primary Stroke Diagnosis (%)

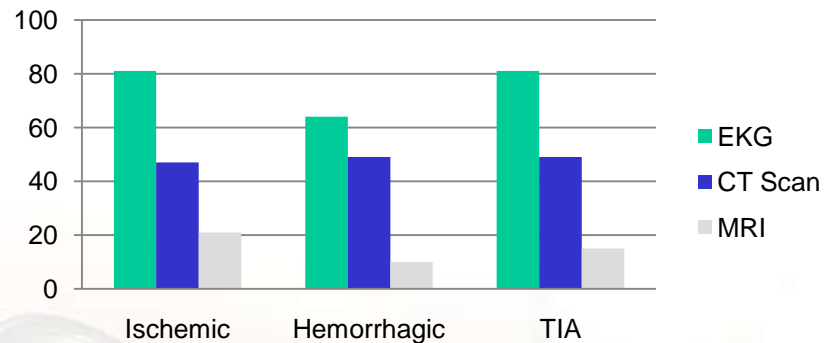
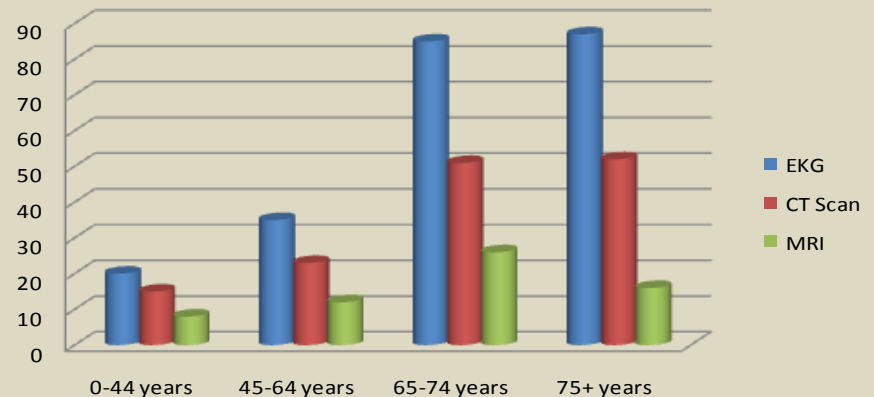


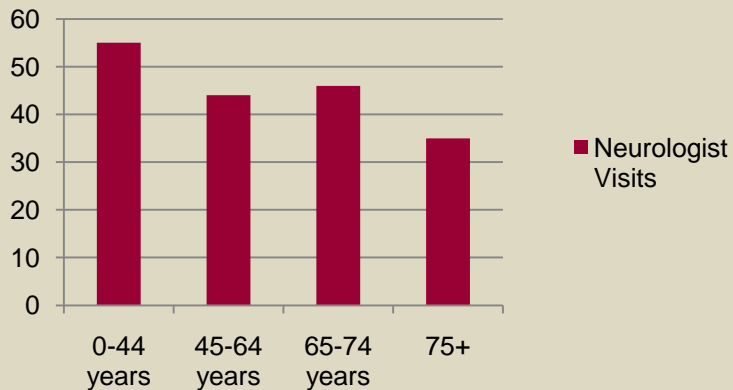
Chart 9 - Diagnostic Testing by Age



Baseline Findings – Neurological Visits

Neurological Visits

Chart 11 - Neurologist Visits by Age
(% of stroke admissions)



Neurologist Visit by Diagnosis:

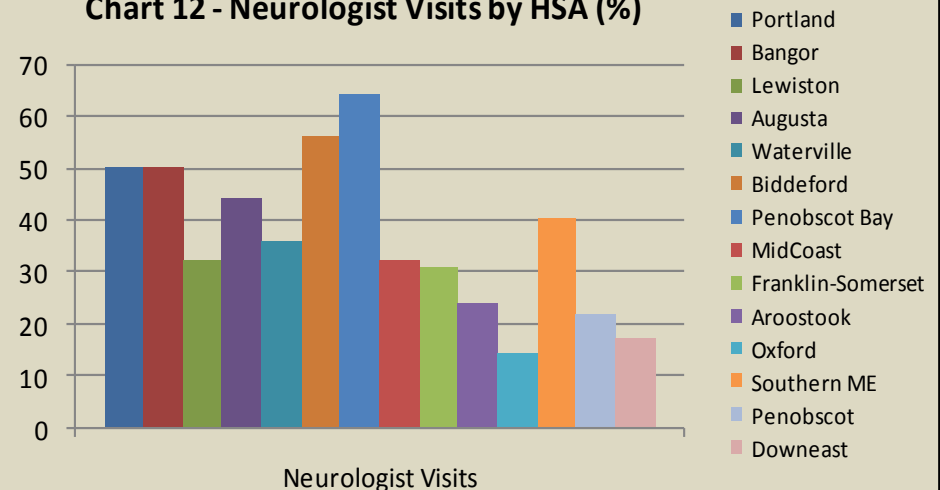
Ischemic: 44%

Hemorrhagic: 32%

TIA: 32%

- Ischemic admissions most likely to receive visits, as are those aged 0-44
- Admissions in northern region significantly **less** likely to receive visits

Chart 12 - Neurologist Visits by HSA (%)



Baseline Findings – Surgical Procedures

Surgical Procedures

Endarterectomy on Cerebrovascular Admissions: 2003 – 2006

	Endarterectomy (%)	
Diagnosis		
Ischemic (N=5,281)	1.4%	(n=75)
Hemorrhagic (N=1,411)	0.1%	(n=1)
TIA (N=1,711)	1.1%	(n=19)
Other CV dx (N=3,799)	51.4%*	(n=1,951)
Age Group		
0-44 (N=242)	0.4%	(n=1)
45-64 (N=1,866)	21.0%*	(n=391)
65-74 (N=3,217)	27.3%*	(n=878)
75+ (N=6,877)	11.3%	(n=776)
Gender		
Female (N=6,421)	12.6%	(n=808)
Male (N=5,781)	21.4%*	(n=1,238)
Region		
North (N=6,894)	16.3%	(n=1,121)
South (N=5,023)	17.7%*	(n=890)

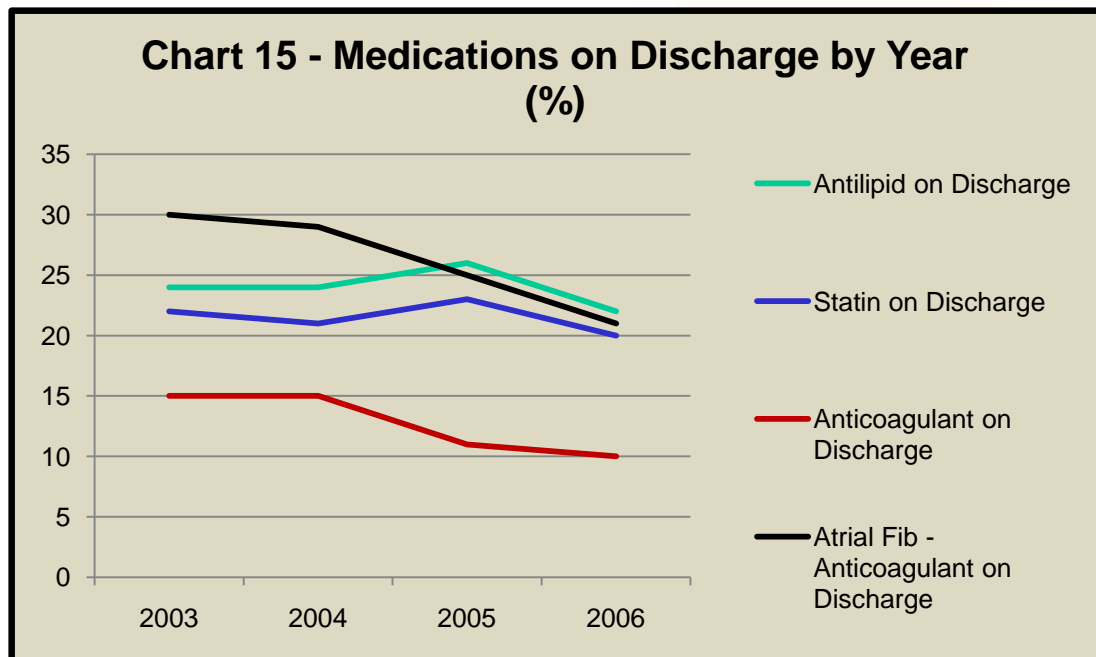
- Rates for endarterectomy were very low among stroke admissions – considerably higher among “other CV diagnoses”
- Males had considerably higher rates of endarterectomy*, as did those up to age 75*, then numbers decreased significantly
- Those in the northern region were significantly less likely to receive endarterectomy*
- Rates of stent insertion were extremely low throughout all populations and regions, and therefore not presented here

Baseline Findings – Meds on Discharge

Medications on Discharge

*Question the reliability of this metric

- Decreasing trend over data period, however not significantly
- Middle age groups had highest rates
- Males more likely to receive medications, but not significantly so



Note: Anti-lipids are a broad category of lipid lowering medications which include statins.

It is evident from the data that most of the anti-lipids used among stroke admissions were statins.



Conclusions and Next Steps

➤ Conclusions:

Claims data can be a reliable source in guiding ongoing stroke systems work. The data are readily available, at low cost, and include state-wide representation of multiple stroke diagnosis and treatment metrics

➤ Next Steps:


- Share baseline data state-wide with providers, organization, and the public
- Use findings to inform ongoing stroke systems work and assist with addressing identified gaps
- Collaborate with NECC to expand scope of claims analysis including fiscal data and publish results



More Data and Information

- To view the full report:

<http://mainehearthealth.org/sites/default/files/7-2010%20Stroke%20Claims%20Analysis%20Report%20-%20final.pdf>





Questions/Follow-up

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Stroke Care in Maine Workgroup members

Sources:

1. Maine Health Data Organization: All-Payer Claims Database; 2003-2006 (ICD 9: 430-436)
2. American Stroke Association: GWTG-Stroke Regional Database; January – December, 2006
3. Penobscot Bay Medical Center & Eastern Maine Medical Center GWTG-Stroke Databases, 2006-2007