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BACKGROUND

- Stroke Education provided to hospitalized stroke patients and their families is an endorsed stroke performance measure (PM) tracked by several national quality improvement programs
- Stroke Education consists of 5 distinct subcomponents: modifiable risk factors (RF), stroke warning signs (SSX), EMS activation (EMS), physician follow-up (PFU), and discharge medications reconciliation (MED)

OBJECTIVES

- Determine the compliance with the Stroke Education Performance Measure and its subcomponents
- Identify predictors of receiving Stroke Education in the Michigan Stroke Registry Quality Improvement Program (MiSRQIP)

METHODS

- 4282 acute stroke admissions from 20 hospitals participating in MiSRQIP in 2008 were eligible for Stroke Education
- Patients who expired, were comfort measures only, who were transferred to another hospital, discharged against medical advice, discharged to hospice, and those with an unknown discharge destination were excluded from the measure
- Compliance results were measured for the overall PM and each subcomponent
- Independent factors associated with PM compliance were identified using GEE multivariable logistic regression

RESULTS

- The average age of the patients was 69.8 years, 52.6% were female, 59.2% had ischemic stroke (IS), 9.8% hemorrhagic stroke (HS), 27.0% transient ischemic attack, and 4.1% stroke not specified (SNS)
- Overall compliance with the Stroke Education PM was 59.6%, ranging from 5.8% to 91.6% across the participating hospitals
- Patients could receive from 0 to 5 subcomponents of the Stroke Education PM (Figure 1). Most patients received either 2 subcomponents or all 5
- PFU (94.4%) and MED (91.2%) were the most frequently delivered subcomponents

Figure 1. Number of Stroke Education Subcomponents Received

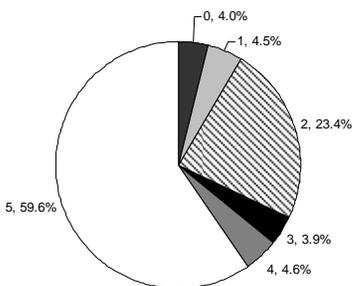
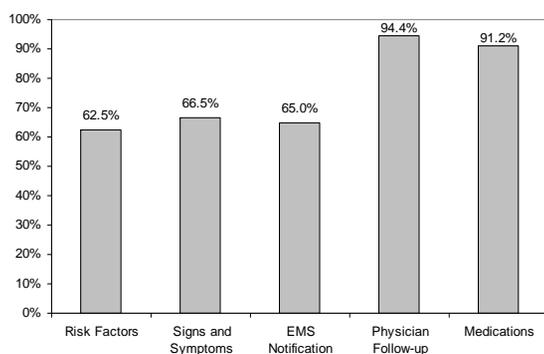


Figure 2. Frequency of Individual Subcomponents



RESULTS

Table 1. Characteristics Associated with Receiving all 5 vs. Receiving <5 Components of the Stroke Education Measure

	N	Received All 5 %	Received <5 %	χ ² , p-value
Age				
<50 yrs	449	63.0%	37.0%	18.4, 0.001
50-59	677	62.2%	37.8%	
60-69	860	62.9%	37.1%	
70-79	1071	59.1%	40.9%	
>80	1225	55.1%	44.9%	
Race				
White	3295	56.4%	43.6%	62.1, <0.001
Non-White	987	70.4%	29.6%	
Gender				
Male	2031	62.1%	37.9%	9.8, .002
Female	2251	57.4%	42.6%	
Stroke Type				
Ischemic	2533	66.0%	34.0%	132.0, <0.001
Hemorrhagic	419	40.6%	59.4%	
TIA	1155	52.3%	47.7%	
SNS	175	61.1%	38.9%	
Pre-Stroke Ambulatory Status				
Able	4195	59.7%	40.3%	0.4, 0.53
Unable	87	56.3%	43.7%	
Discharge Destination				
Home	2294	59.4%	40.6%	0.1, 0.77
Other	1988	59.9%	40.1%	

- Table 1 shows patient characteristics associated with receiving all 5 Stroke Education components
- A higher percentage of younger, non-white, and male patients had a higher compliance with Stroke Education
- Ischemic stroke patients had a higher compliance with Stroke Education compared to hemorrhagic, TIA and SNS
- Patients who were able to ambulate had slightly higher compliance than those who were not
- There was no difference in compliance across patients discharged to home vs. other locations.

Table 2. Crude and Adjusted Odds Ratios of Stroke Education Compliance by Individual Patient Characteristics

	Crude OR (95% CI)	Adjusted OR (95% CI)
Age		
<50 yrs	1	1
50-59	0.97 (0.754, 1.23)	0.90 (0.70, 1.16)
60-69	1.00 (0.79, 1.26)	0.95 (0.74, 1.21)
70-79	0.85 (0.68, 1.06)	0.86 (0.68, 1.09)
>80	0.72 (0.58, 0.90)	0.75 (0.60, 0.95)
Race		
White	0.54 (0.47, 0.63)	0.57 (0.48, 0.66)
Non-White	1	1
Gender		
Male	1	1
Female	0.82 (0.73, 0.93)	0.86 (0.76, 0.98)
Stroke Type		
Ischemic	1	1
Hemorrhagic	0.35 (0.29, 0.43)	0.34 (0.27, 0.42)
TIA	0.56 (0.49, 0.65)	0.60 (0.52, 0.70)
SNS	0.81 (0.59, 1.11)	0.88 (0.64, 1.21)
Pre-Stroke Ambulatory Status		
Able	1	1
Unable	0.82 (0.65, 1.03)	0.80 (0.63, 1.01)

- Age, Race, Gender, Stroke Type, and Pre-Stroke Ambulatory Status were included in a multivariable logistic regression model (Table 2)
- Crude odds ratios reflect the results shown in Table 1
- Adjusted odds ratios provide the following results:
 - Patients older than 80 years were the only age category that was significantly less likely to receive Stroke Education
 - White patients were significantly less likely to receive Stroke Education than non-whites
 - Female patients were significantly less likely to receive Stroke Education than males
 - Patients with hemorrhagic stroke and TIA were the only stroke types identified to be significantly less likely to receive Stroke Education

CONCLUSIONS

- Compliance with the Stroke Education PM was only 59.7% in this registry
- High compliance with the 2 subcomponents, PFU and MED, is likely because these measures are delivered to all hospitalized patients not just stroke patients
- The other three stroke specific measures RF, SXS, and EMS were delivered in less than 70% of stroke patients
- Important QI opportunities reside in the delivery of stroke education and in the large differences between hospitals
- As of November 2009, Stroke Education is limited to those patients discharged home, note that the compliance with Stroke Education was no different in this subgroup 59.4% vs. 59.9% for those discharged not home