

*Stroke:
Building a Business Case for a
Stronger Stroke Program
Business Case II*

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North Shore-LIJ Health System Statistics

- Ⓢ Not-for Profit Health System
- Ⓢ 15 Hospitals
- Ⓢ 10 NY State Designated Primary Stroke Centers
- Ⓢ 2 Comprehensive Stroke Centers
- Ⓢ 1 Joint Commission Accredited Stroke Center
- Ⓢ Research Institute
- Ⓢ 4 Trauma Centers
- Ⓢ 5 Home Health Agencies
- Ⓢ 6,066 Beds
- Ⓢ 37,500 Employees
- Ⓢ 8,000 Physicians
- Ⓢ 10,500 Nurses
- Ⓢ 1,250 Residents and Fellows
- Ⓢ 1,300 Medical Students
- Ⓢ 1,400 Nursing Students
- Ⓢ 22,196 Babies Delivered
- Ⓢ 235,591 Hospital Discharges
- Ⓢ 445,756 ER Visits and Admissions
- Ⓢ 545,259 Home Health Visits
- Ⓢ 4,100 Stroke Admissions
- Ⓢ 109,111 Ambulatory Surgeries
- Ⓢ 986 Clinical Research Studies
- Ⓢ 1,950 Community Education Programs
- Ⓢ Services to population of 5.2 million



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The North Shore-LIJ Health System



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Neuroscience Structure

Harvey Cushing Institutes of Neurosciences

| | | | |
|--|---|--|----------------------------------|
| <i>The Chiari Institute</i> | <i>Movement Disorders Institute</i> | <i>Brain Tumor Institute</i> | <i>The Spine Institute</i> |
| <i>Epilepsy Institute</i> | <i>Neurovascular and Stroke Institute</i> | <i>Institute for Neurorehabilitation</i> | <i>Pain Institute</i> |
| <i>Institute for Neuromuscular and Peripheral Nerve Diseases</i> | <i>Institute for Neurodegenerative Diseases</i> | <i>Institute for Pediatric Neurosciences</i> | <i>Institute for Neurotrauma</i> |

The mission of the Harvey Cushing Institutes of Neuroscience is to provide state-of-the-art medical care while contributing to advances in research and education from which an improved understanding of neurological diseases can come. To this end, the institutes have been established on broad lines that will attract not only eminent attendants but discriminating patients from around the world, whose very presence will honor the Cushing name and make those in the regional community, for whom the programs are primarily intended, more appreciative of the Health System and more likely to be well served by it.

- Established-Chiari; Movement Disorders and Brain Tumor
- Evolving - Neurovascular and Stroke; Epilepsy; Spine; Pain and Neuro-rehabilitation
- In Development - Neuro-trauma; Neuromuscular and Peripheral Nerve Diseases; Neurodegenerative Diseases; Pediatric Neurosciences



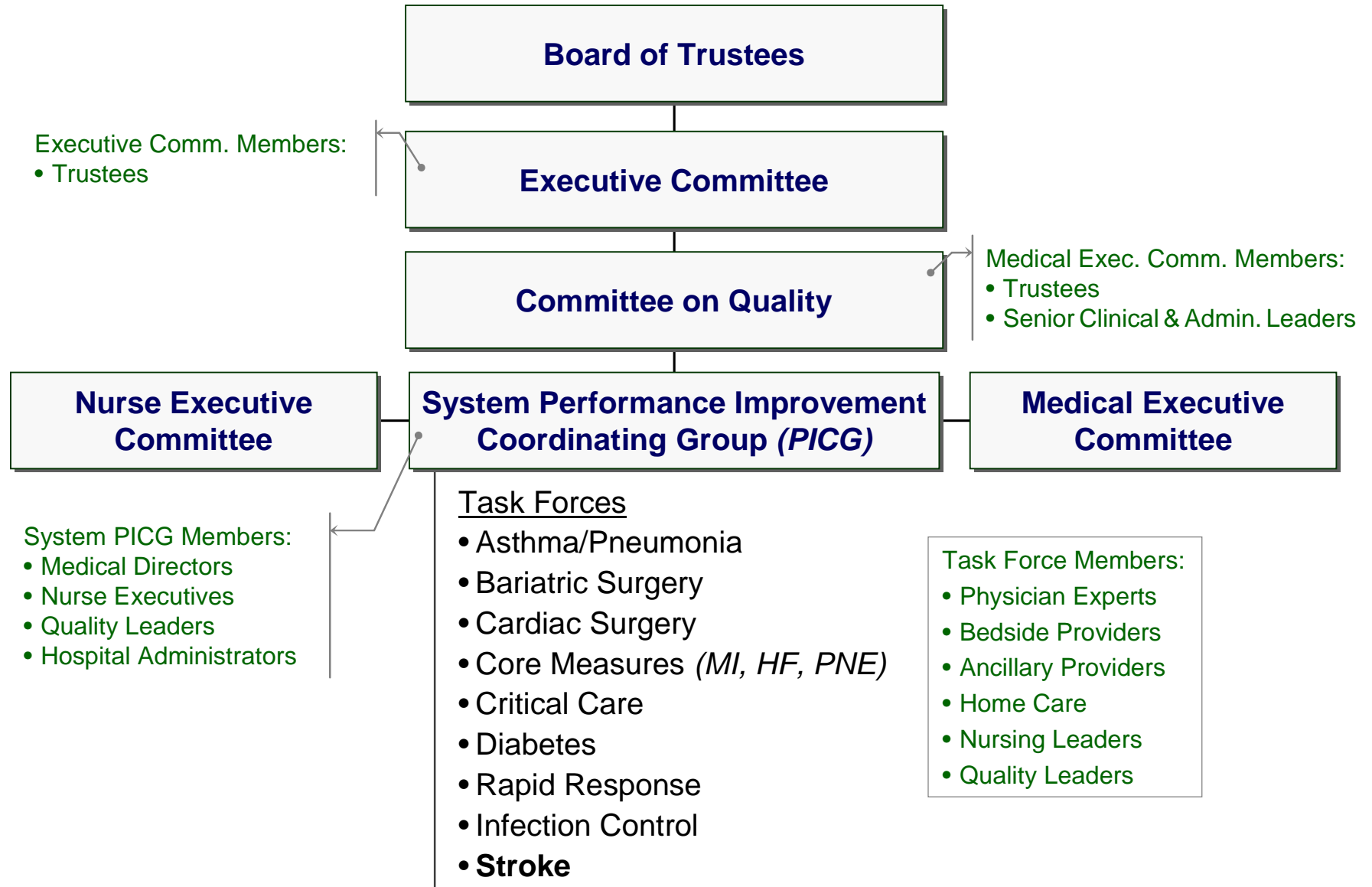
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Communication of Quality Information Taken Seriously



Stroke Task Force

- Participation from 10 health system hospitals - MD's and Nurses
 - All are NYS DOH Primary Stroke Center Certification
 - 2 Comprehensive Stroke Centers
 - 1 Joint Commission Accredited Stroke Center
- Uniform methodology for measurement of performance – Initial focus on process and quality measurements
 - GWTG-Stroke
 - Achieve GWTG-Stroke Performance Awards in all hospitals
 - 85% compliance in seven performance measures
- Integrate evidence-based treatment for Stroke across the continuum of care
 - Develop standardized order set for management of Stroke/TIA patients
 - Stroke Code Sheet
 - Stroke CareMap®
 - Stroke Discharge Plan
 - Establish Stroke Teams and 24/7 processes at hospital level to ensure a three-hour response time to patients
- Share best practices and improve communication between sites



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Designated Stroke Center Staffing

- Physician Director appointed at every location
 - Employed
 - Neurologists
 - ER Physicians
 - Community Physician – not compensated
 - Community Physician – compensated
- Stroke Coordinator at every location
 - QM Nurses
 - Neuroscience Nurses
 - Dedicated Nurses



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Outcome Improvements Measured with Monthly Report Cards

- Metrics include
 - Patient Experience
 - Quality Measures – Stroke excellence was prioritized by the NS-LIJHS Board of Trustee’s Committee on Quality and has been placed on all report cards
 - Operational Measures
 - Financial Measures
 - GWTG measures for Stroke Directors
- Accountability for performance at all levels
 - Executive Director
 - Medical Director
 - Nurse Executive
 - Service Line Leaders
 - Program Directors/Physicians
- Compensation/Bonuses Driven by Performance on Report Cards



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Neuroscience Service Line Report Card Implemented in June of 2008

North Shore LIJ Health System

| Patient Experience | 2007 Baseline | 3 month avg Score | | Aug YTD Actual Score | YTD Goal | Threshold Goal | Annual Goal | Stretch Goal |
|-------------------------|---------------|-------------------|--------------|----------------------|----------------|----------------|---------------|---------------|
| *Std MD | 81.2 | 81.8 | | 82.1 | 83.2 | 82.2 | 83.2 | 84.2 |
| Quality | 2007 Baseline | Jun 2008 GWTG | | YTD Goal | Threshold Goal | Annual Goal | Stretch Goal | |
| *Dysphagia Screenings | N/A | 62% | | 85% | 85% | 85% | 90% | |
| Financial Performance | 2007 Baseline | Aug Actual | Aug Budget | Aug YTD Actual | YTD Goal | Threshold Goal | Annual Goal | Stretch Goal |
| Neurology discharges | 8,212 | 919 | 1,003 | 7,732 | 7,664 | 8,212 | 8,384 | 8,803 |
| Neurosurgery | 1,249 | 135 | 158 | 1,060 | 1,090 | 1,299 | 1,339 | 1,406 |
| Neuro Spine (MDC 1) | 382 | 20 | 45 | 286 | 348 | 474 | 489 | 513 |
| Ortho Spinal (MDC 8) | 2,639 | 307 | 306 | 2,570 | 2,350 | 2,544 | 2,623 | 2,754 |
| *Total | 12,482 | 1,381 | 1,512 | 11,648 | 11,452 | 12,529 | 12,835 | 13,476 |
| Operational Performance | 2007 Baseline | Aug MTD Actual | | Aug YTD Actual | YTD Goal | Threshold Goal | Annual Goal | Stretch Goal |
| *Stroke DRG LOS | 6.44 | 7.46 | | 6.77 | 6.23 | 6.33 | 6.23 | 6.13 |

- Exceeds Annual Goal
- Equal to Annual Goal
- Below Annual Goal



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Neuroscience Service Line Report Card

Long Island Jewish Hospital

| Patient Experience | 2007 Baseline | 3 month avg Score | | Aug YTD Actual Score | YTD Goal | Threshold Goal | Annual Goal | Stretch Goal |
|-------------------------|---------------|-------------------|------------|----------------------|--------------|----------------|--------------|--------------|
| *Std MD | 77.1 | 78.9 | | 81.6 | 79.1 | 78.1 | 79.1 | 80.1 |
| Quality | 2007 Baseline | Jun 2008 GWTG | | | YTD Goal | Threshold Goal | Annual Goal | Stretch Goal |
| *Dysphagia Screenings | N/A | 37% | | | 85% | 85% | 85% | 90% |
| Financial Performance | 2007 Baseline | Aug Actual | Aug Budget | Aug YTD Actual | YTD Goal | Threshold Goal | Annual Goal | Stretch Goal |
| Neurology discharges | 1,229 | 98 | 108 | 837 | 837 | 1,229 | 1,252 | 1,314 |
| Neurosurgery | 186 | 19 | 22 | 151 | 158 | 229 | 236 | 247 |
| Neuro Spine (MDC 1) | 21 | 0 | 2 | 14 | 12 | 17 | 18 | 21 |
| Ortho Spinal (MDC 8) | 404 | 31 | 39 | 319 | 287 | 423 | 436 | 458 |
| *Total | 1,840 | 148 | 170 | 1,321 | 1,294 | 1,898 | 1,942 | 2,040 |
| Operational Performance | 2007 Baseline | Aug MTD Actual | | Aug YTD Actual | YTD Goal | Threshold Goal | Annual Goal | Stretch Goal |
| *Stroke DRG LOS | 6.32 | 7.76 | | 6.31 | 6.12 | 6.22 | 6.12 | 6.02 |

- Exceeds Annual Goal
- Equal to Annual Goal
- Below Annual Goal

Std MD includes all Neurology and Neurosurgery MDs across the Health System



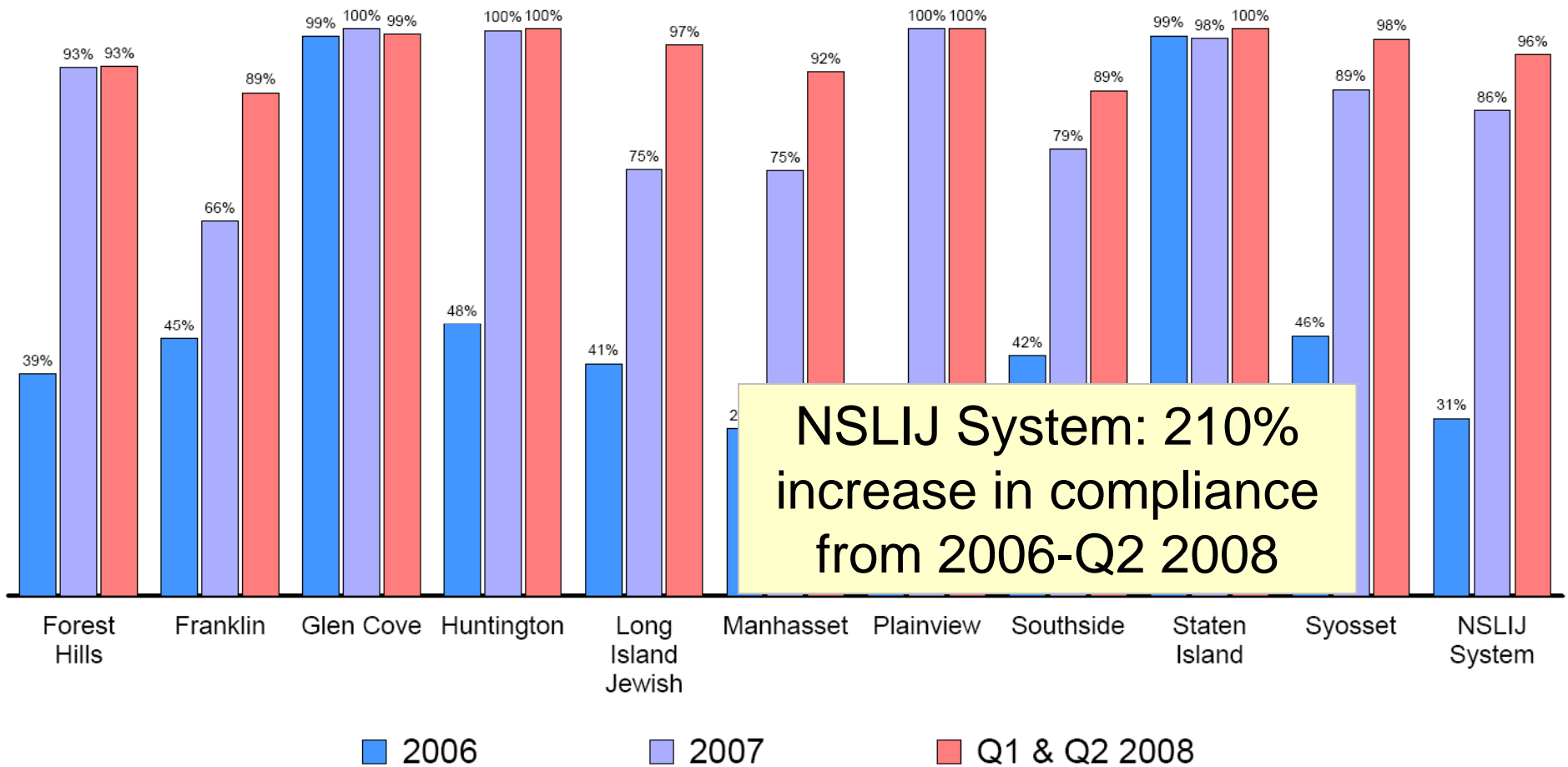
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Stroke Cases Entered in GWTG Tool Percent Compliance (by Hospital) 2006-Q2 2008



Data Source: Outcome Science/SPARCS

Stroke Performance Measures



- **Composite Measure:** The composite quality of care measure indicates how well the hospital does to provide appropriate, evidence-based interventions for each patient based on:
 - **Performance Measures:**
 - **IV rt-PA 2 Hour:** Percent of acute ischemic stroke patients who arrive at the hospital within 120 minutes (2 hours) of time last known well and for whom IV t-PA was initiated at this hospital within 180 minutes (3 hours) of time last known well.
 - **Early Antithrombotics:** Percent of patients with ischemic stroke or TIA who receive antithrombotic therapy by end of hospital day two.
 - **Antithrombotics:** Percent of patients with an ischemic stroke or TIA prescribed antithrombotic therapy at discharge.
 - **Anticoagulation** for AF: Percent of patients with an ischemic stroke or TIA with atrial fibrillation discharged on anticoagulation therapy.
 - **DVT-Prophylaxis:** Percent of patients with an ischemic stroke, TIA or a hemorrhagic stroke and who are non-ambulatory who receive DVT prophylaxis by end of hospital day two.
 - **LDL100 or ND:** Percent of ischemic stroke or TIA patients with LDL>100, or LDL not measured, or on cholesterol-reducer prior to admission, who are discharged on cholesterol reducing drugs.
 - **Smoking Cessation:** Percent of patients with ischemic or hemorrhagic stroke with a history of smoking cigarettes, who are, or whose caregivers are, given smoking cessation advice or counseling during hospital stay.



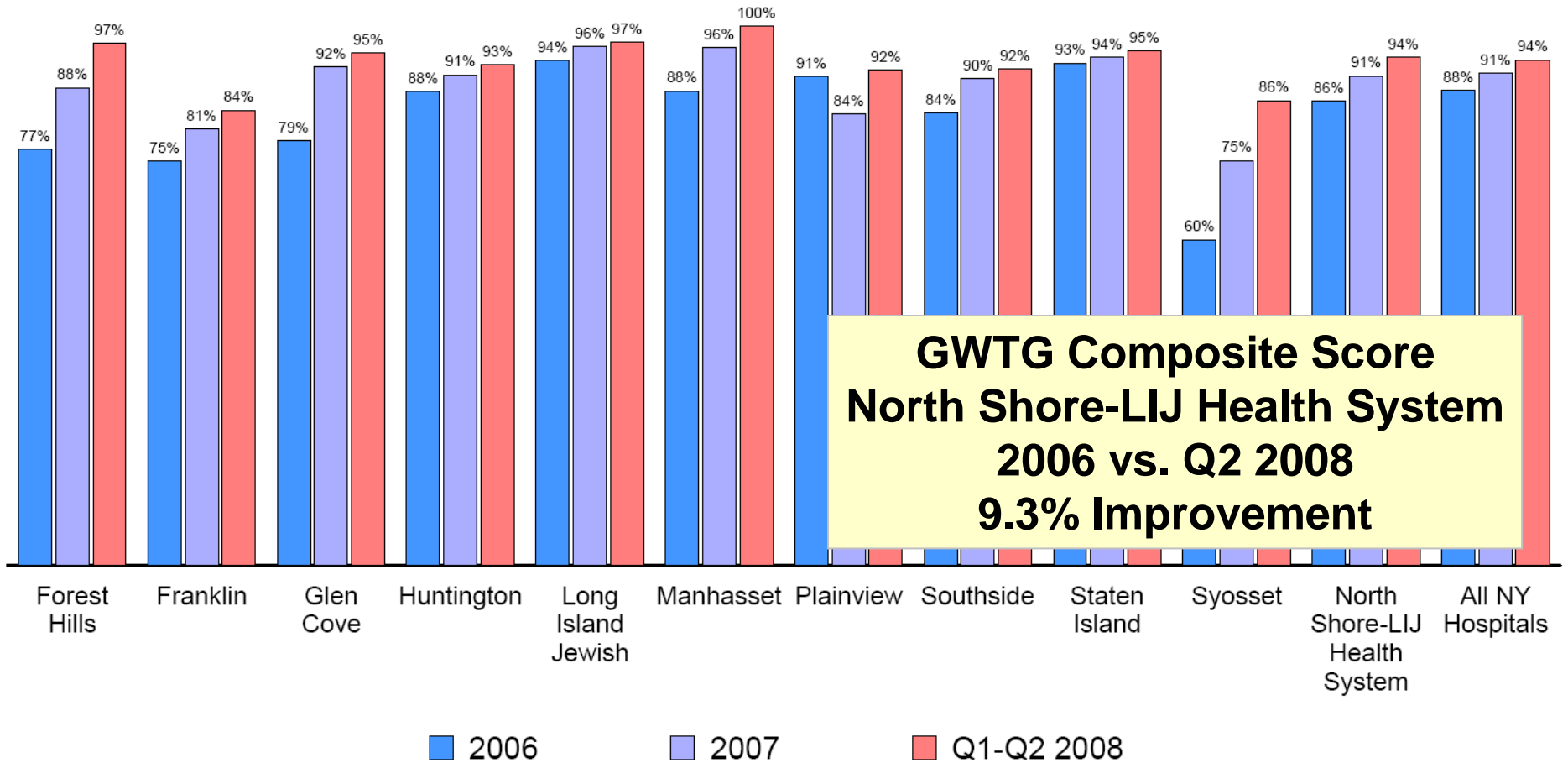
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North Shore-LIJ Health System Stroke Performance Measures Composite Score (2006-Q2 2008)



Data Source: Outcome Science

Center for Disease Control (CDC)/Coverdell (COV) Consensus Measures:

- January 2008 Center for Disease Control, American Heart Association, Joint Commission adopted ten consensus measures:
 - Seven Performance Measures plus three new measures
 - Dysphagia Screening (swallowing)
 - Rehabilitation Considered
 - Stroke Education



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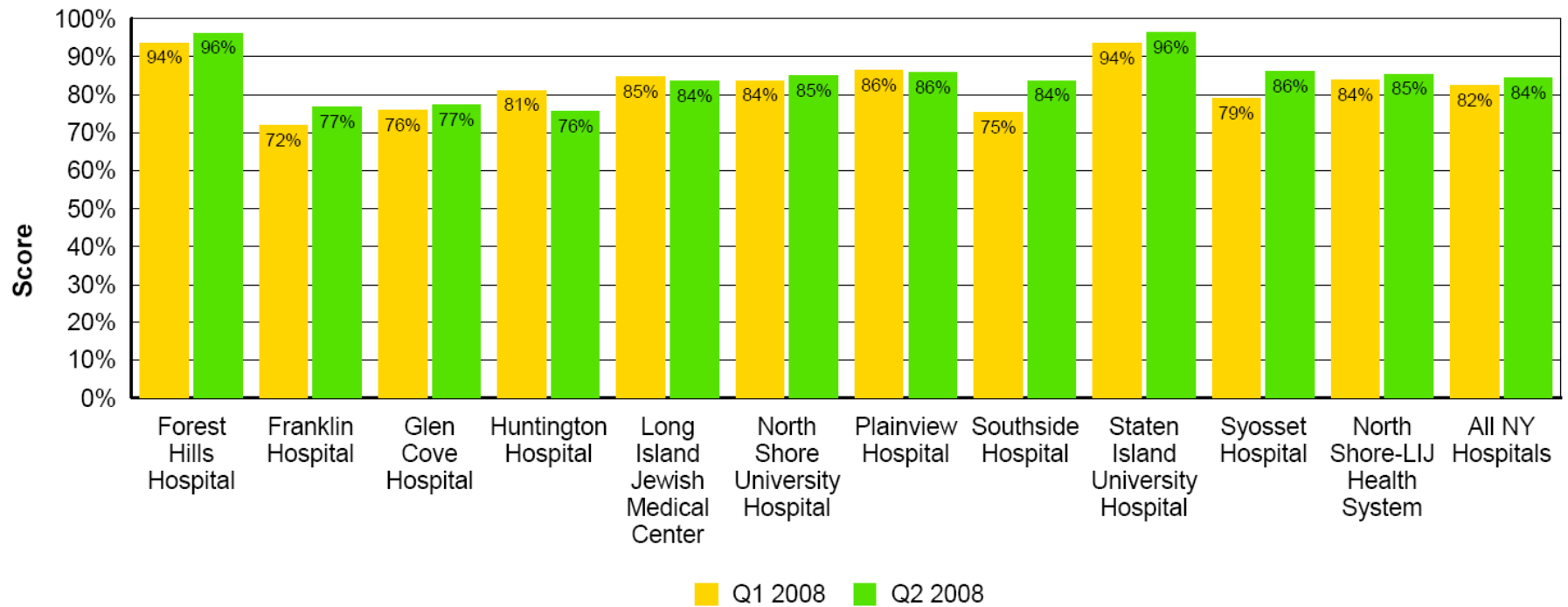


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Stroke Get With The Guidelines Performance Measures

For CDC/COV Composite Score



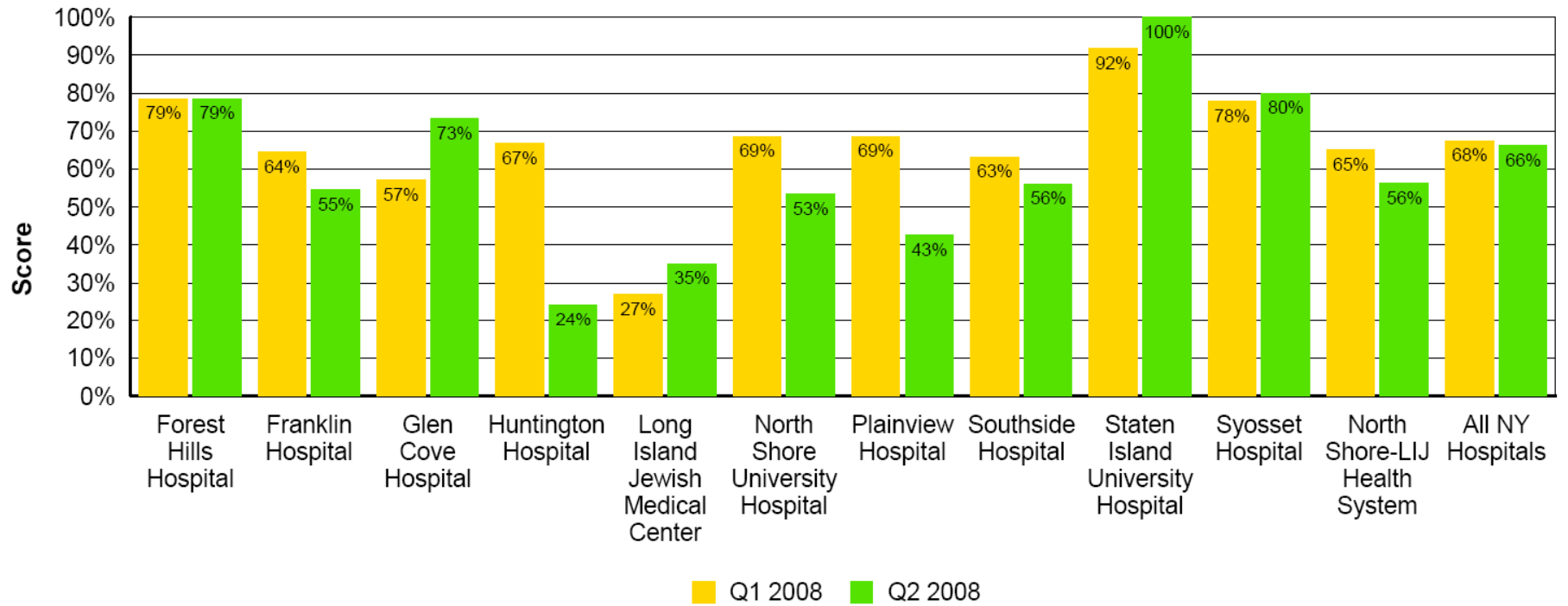
Number of Patients

| | Forest Hills | Franklin | Glen Cove | Huntington | LIJ | NSUH | Plainview | Southside | Staten Island | Syosset | NSLIJ System | All NY Hospitals |
|---------|--------------|----------|-----------|------------|-----|------|-----------|-----------|---------------|---------|--------------|------------------|
| Q1 2008 | 56 | 81 | 42 | 82 | 96 | 182 | 91 | 72 | 138 | 28 | 868 | 4441 |
| Q2 2008 | 42 | 86 | 44 | 60 | 99 | 168 | 88 | 75 | 155 | 25 | 842 | 4349 |

Data Downloaded: August 27, 2008

Stroke Get With The Guidelines Performance Measures

For Dysphagia Screen



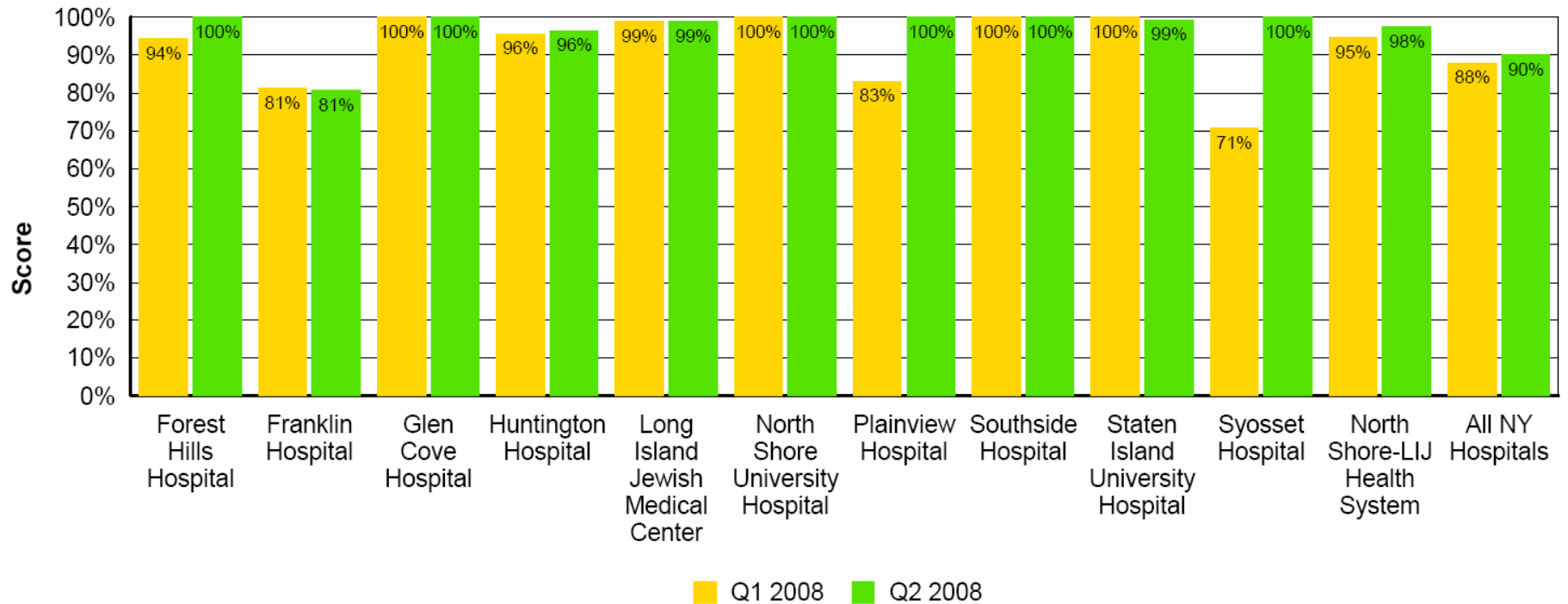
Number of Patients

| | Forest Hills | Franklin | Glen Cove | Huntington | LIJ | NSUH | Plainview | Southside | Staten Island | Syosset | NSLIJ System | All NY Hospitals |
|---------|--------------|----------|-----------|------------|-----|------|-----------|-----------|---------------|---------|--------------|------------------|
| Q1 2008 | 28 | 45 | 14 | 30 | 74 | 118 | 35 | 38 | 73 | 9 | 464 | 2705 |
| Q2 2008 | 14 | 44 | 15 | 33 | 74 | 103 | 40 | 41 | 63 | 10 | 437 | 2681 |

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Stroke Get With The Guidelines Performance Measures

For Rehabilitation Considered



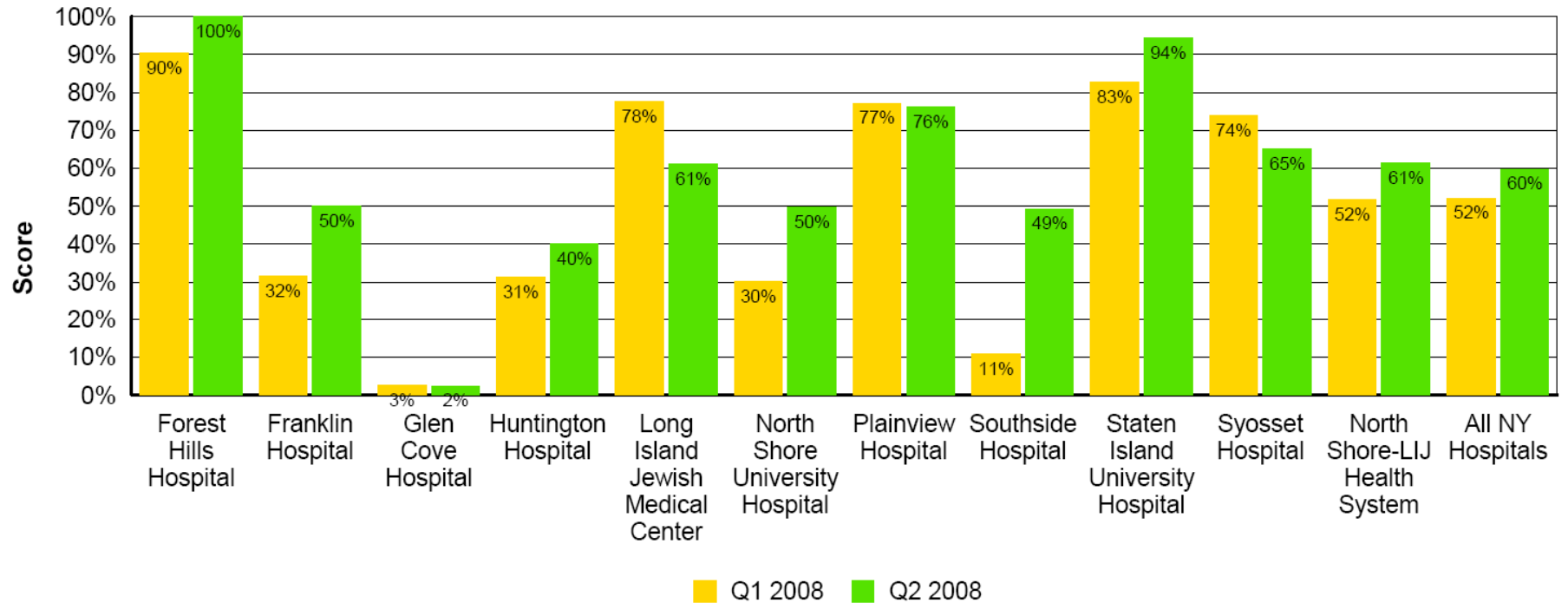
Number of Patients

| | Forest Hills | Franklin | Glen Cove | Huntington | LIJ | NSUH | Plainview | Southside | Staten Island | Syosset | NSLIJ System | All NY Hospitals |
|---------|--------------|----------|-----------|------------|-----|------|-----------|-----------|---------------|---------|--------------|------------------|
| Q1 2008 | 52 | 75 | 38 | 68 | 89 | 164 | 83 | 64 | 127 | 24 | 784 | 3996 |
| Q2 2008 | 34 | 78 | 42 | 55 | 95 | 148 | 80 | 69 | 139 | 22 | 762 | 3908 |

Data Downloaded: August 27, 2008

Stroke Get With The Guidelines Performance Measures

For Stroke Education



Number of Patients

| | Forest Hills | Franklin | Glen Cove | Huntington | LIJ | NSUH | Plainview | Southside | Staten Island | Syosset | NSLIJ System | All NY Hospitals |
|---------|--------------|----------|-----------|------------|-----|------|-----------|-----------|---------------|---------|--------------|------------------|
| Q1 2008 | 52 | 73 | 38 | 67 | 89 | 163 | 83 | 64 | 127 | 23 | 779 | 3905 |
| Q2 2008 | 33 | 78 | 42 | 55 | 95 | 147 | 80 | 69 | 139 | 20 | 758 | 3820 |

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What about the Bottom Line and Outcomes?



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Investments

- **Stroke Center Staffing – Primary and Comprehensive Centers** (varies depending on size and scope of program)
 - Physicians – Interventional, Surgical, Neurology, Intensivists
 - Director Stipends
 - Nurses
 - Data Entry
- **Capital Equipment / Infrastructure**
 - Comprehensive Stroke Center
 - Neuro ICU
 - Bi-Plane
 - OR Equipment
 - Monitored Beds
 - Primary Stroke Center
 - Monitored Beds



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Health System Value of All Strokes

- Total Discharges – approximately 4,000
- Total Contribution Margin Annually - \$27 Million
- Downstream Revenue (not included in \$27 million)
 - Rehabilitation
 - Physical/Speech/Occupational Therapy
 - Radiology – MRI/CT/Doppler Studies
 - Cardiac Services Relationship
- Intangibles
 - Improved Reputation as a Leader in Neurosciences
 - Referral Network Expansion
 - Community Education
 - EMS Education



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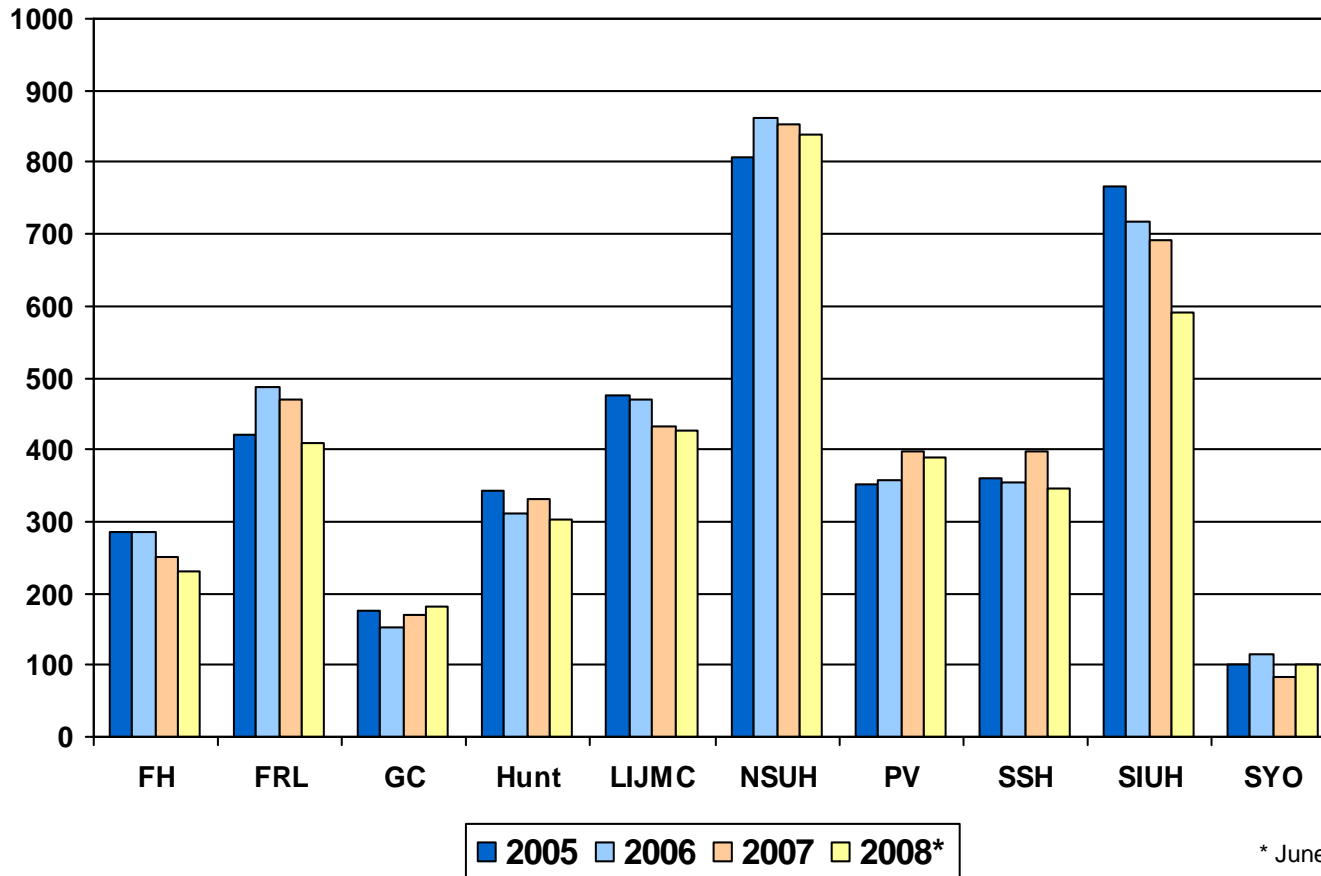


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North Shore LIJ Health System Stroke Discharge Volumes

Range from 100 to 850 annually per site



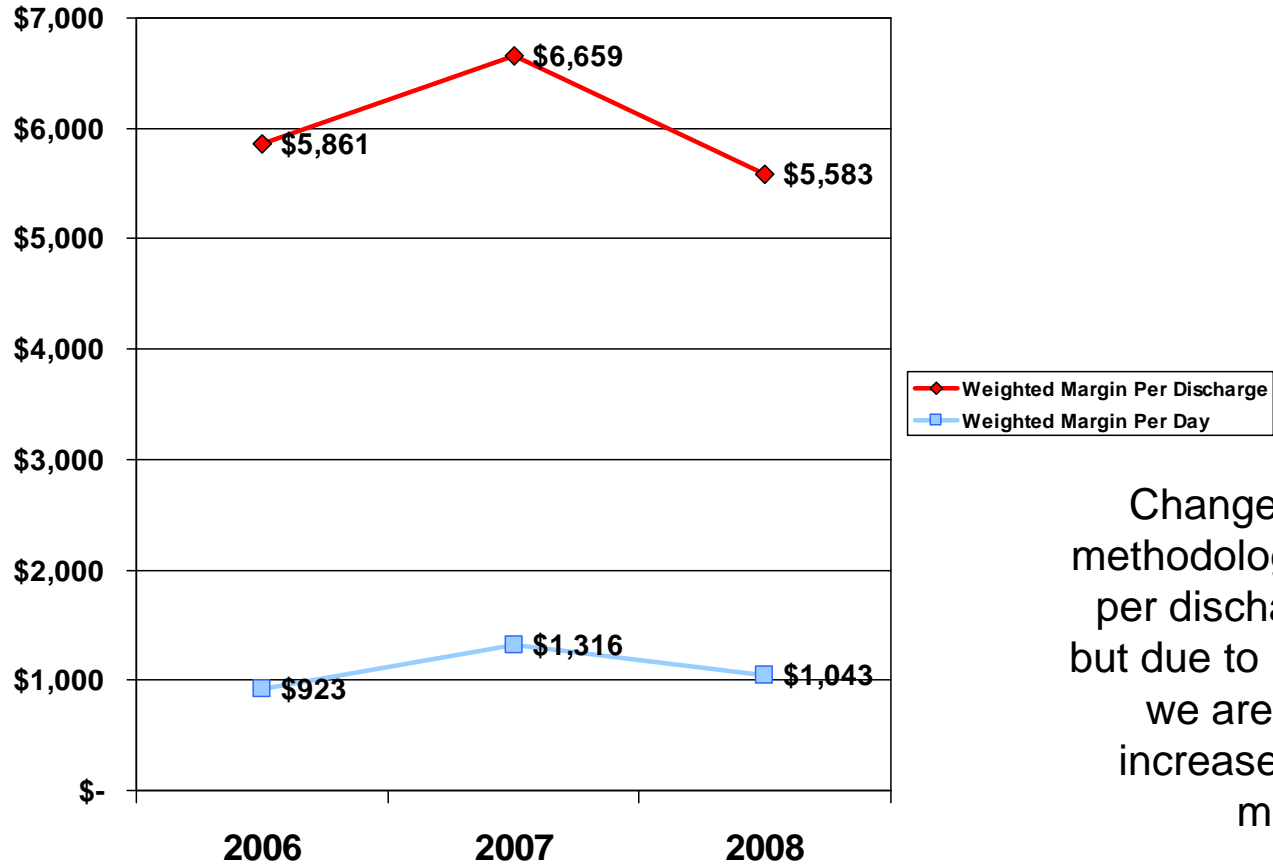
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One Tertiary Hospital Revenue Experience - All Strokes, including hemorrhagic



Change to MS-DRG methodology reduced our per discharge margins, but due to improved LOS, we are working to increase our per day margins



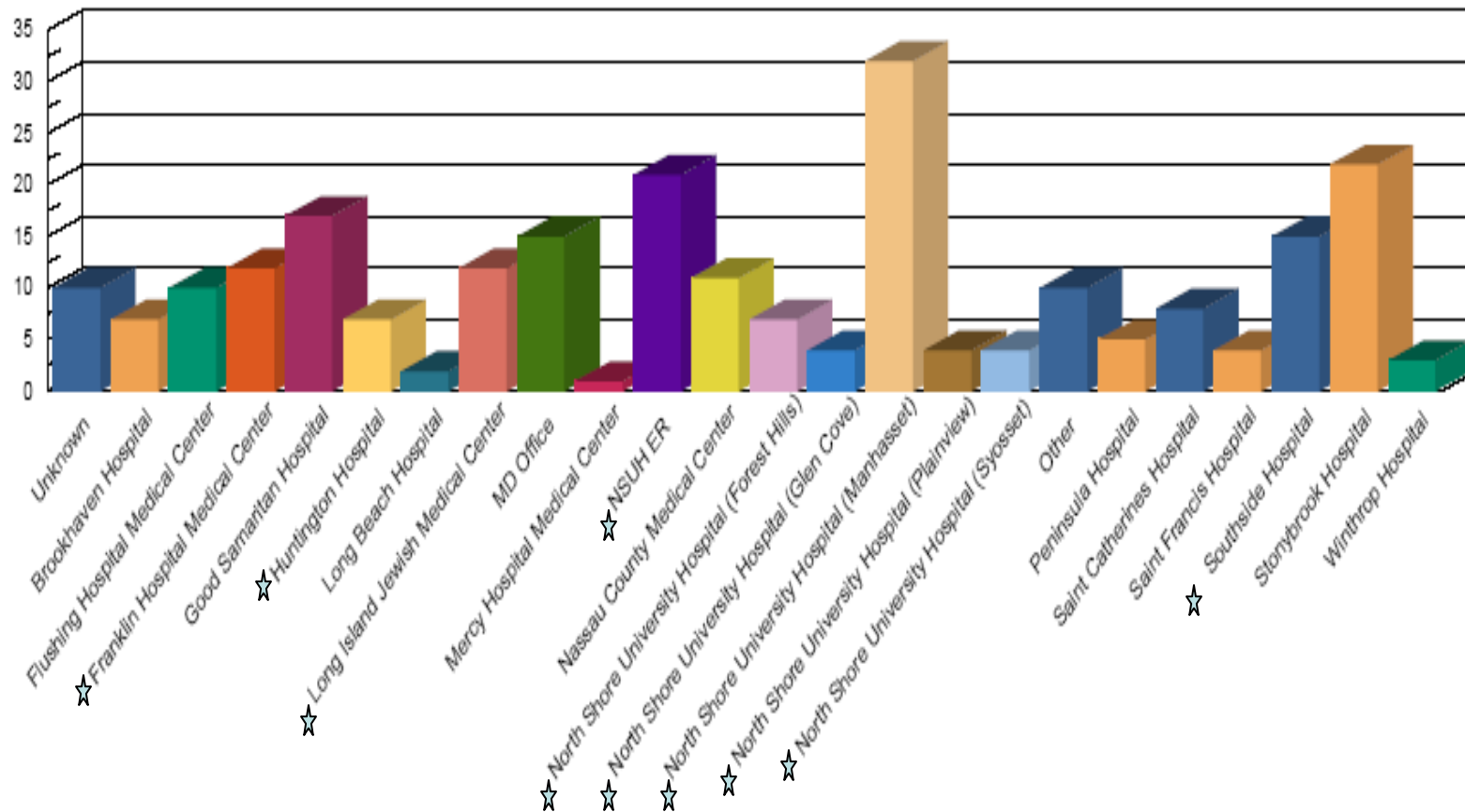
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Comprehensive Stroke Center Referral Sources Beyond North Shore LIJ Health System Hospitals



The Brain Aneurysm Center accepts referrals from both System and Non-System hospitals throughout Nassau, Suffolk and Queens Counties.



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More Importantly, What about Outcomes?



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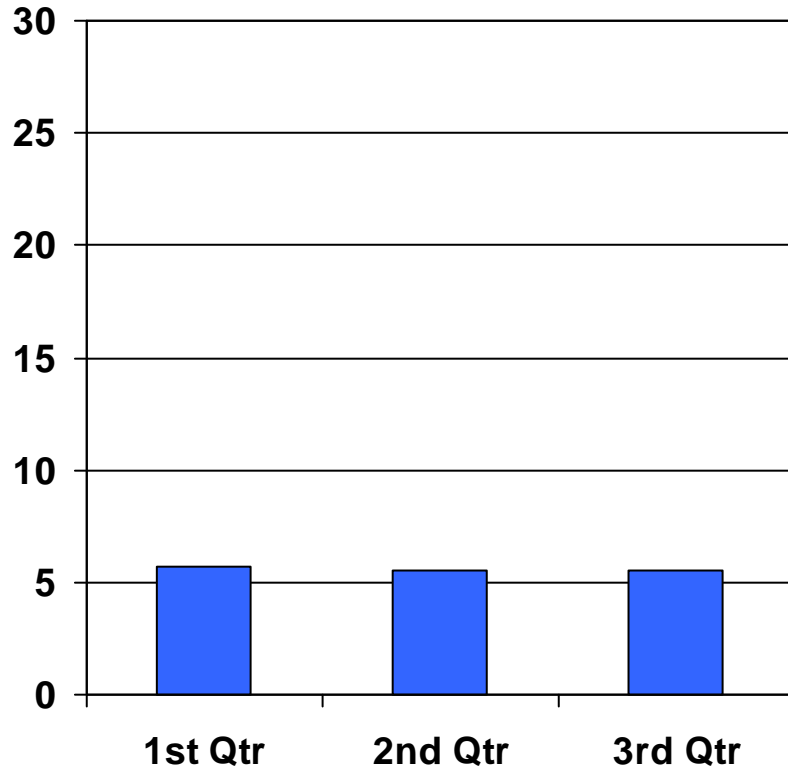


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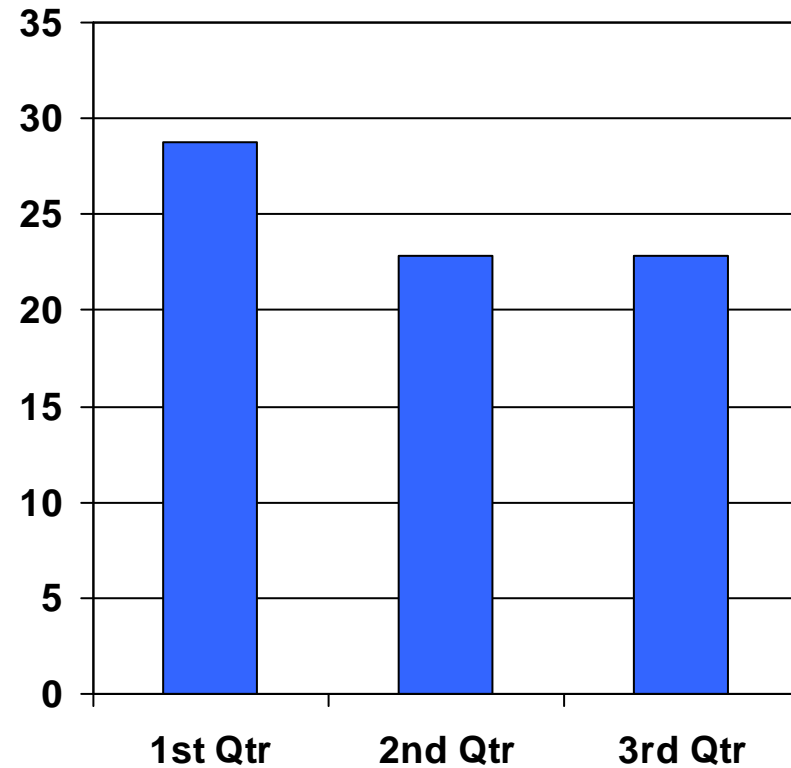
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North Shore LIJ Health System 2008 Length of Stay

Medical Strokes - All Hospitals



Surgical Strokes - All Hospitals



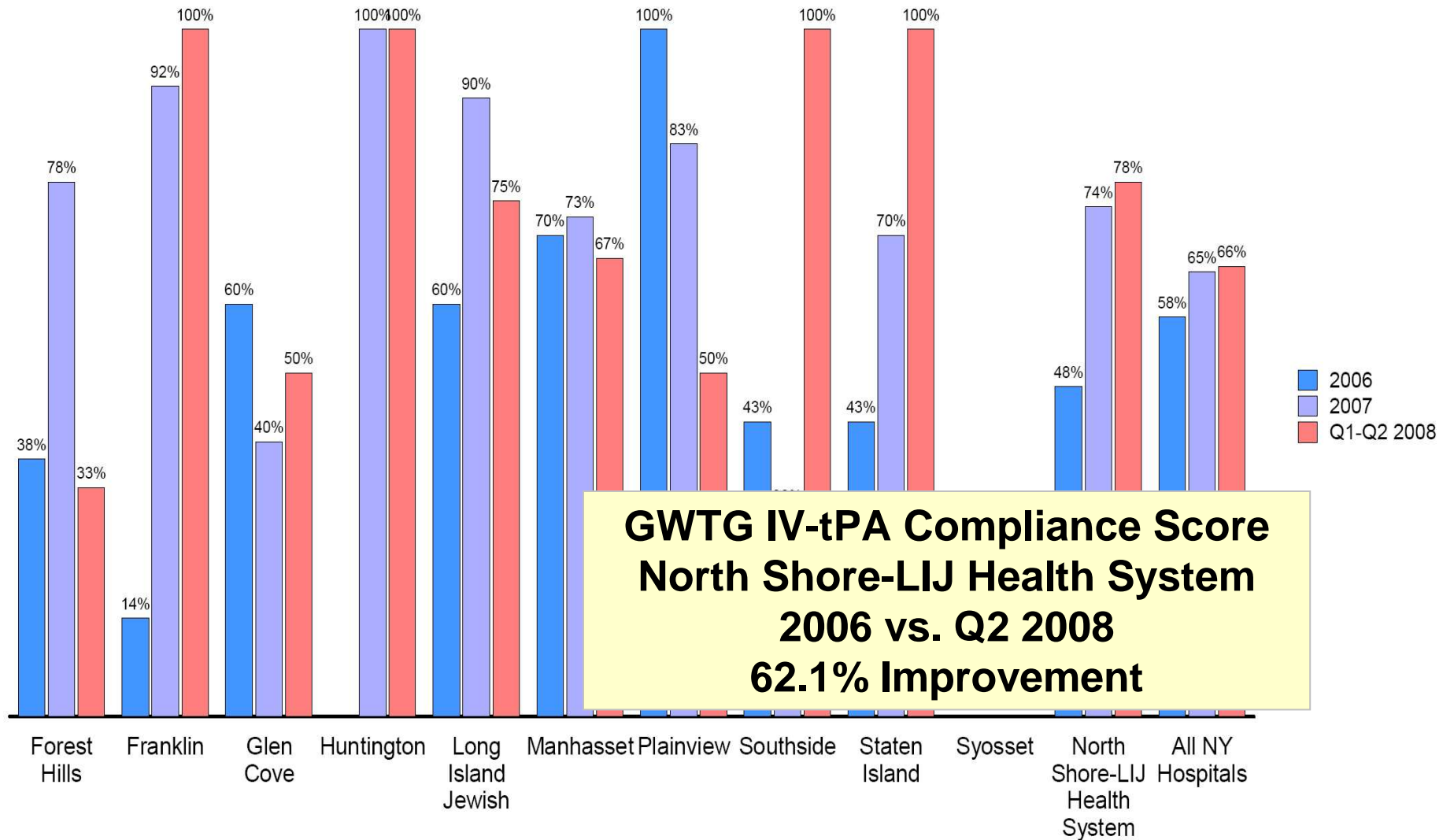
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Ischemic Stroke IV-tPA Compliance 2006 - Q2 2008



Note: Percent change is based on data from 2007 - 2008 for Huntington Hospital.

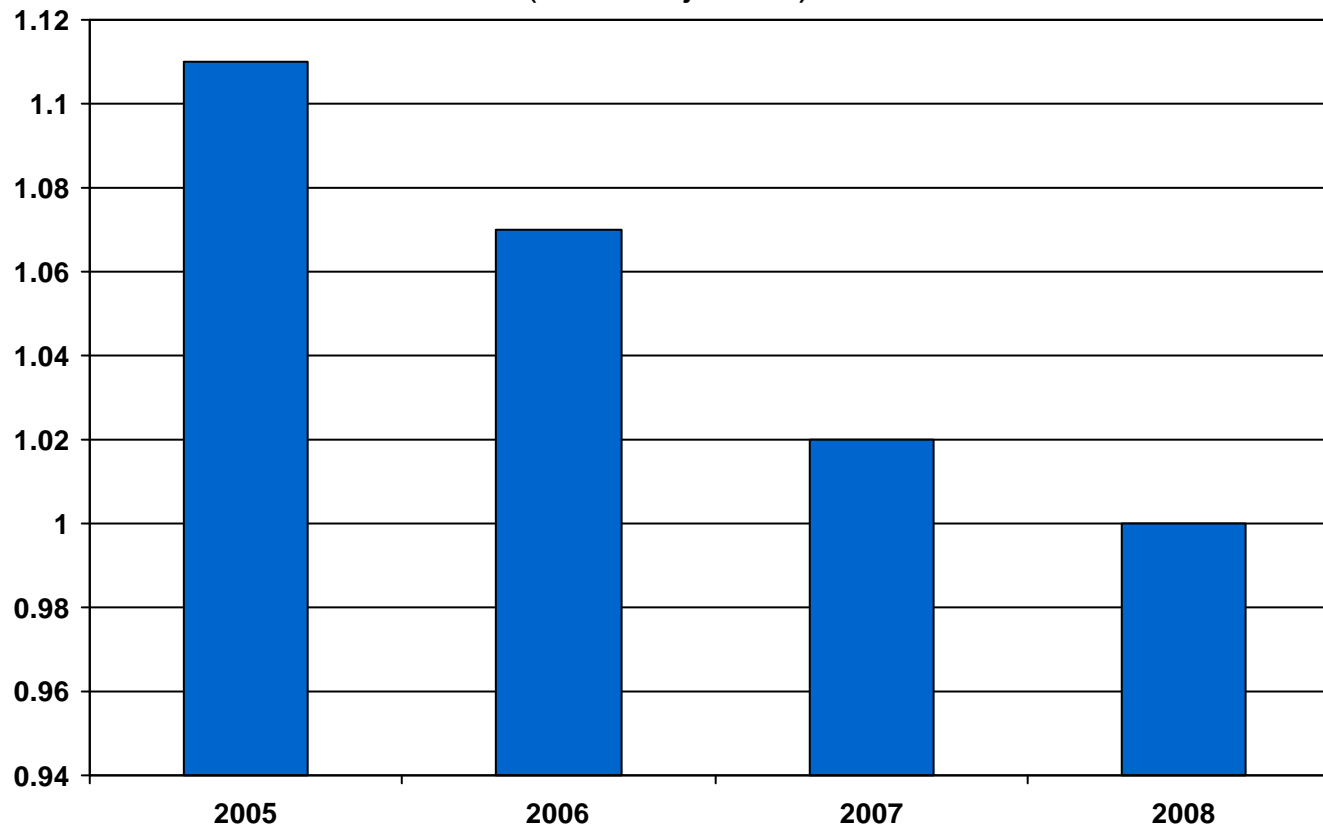
**No percent change was calculated for Syosset Hospital because they had no eligible patients for IV-tPA 2006-2008.

Data Source: Outcome Science

Data Download: 11/12/2008

North Shore LIJ Health System Expected Mortality Rate Index

An Index of 1 Indicates the Expected Mortality Equals the Observed Mortality
(Risk Adjusted)



Data Source-Premier
Clinical Advisor



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What's Next?

- Continue to Strengthen Clinical Documentation
- Continue to Raise the Bar – Stroke Task Force Focus
 - Improve Consensus Measures
 - Individual Physician Performance Monitors (Clinical Advisor)
 - Service Excellence Enhancements
 - Cost Reduction/LOS Reductions
 - Mortality Reduction and Quality Enhancements
 - Long Term Outcome Studies
 - Continue Community and EMS Education Outreach
- Continue to Develop Referrals
 - Telemedicine and Robotic Coverage Models
- Establish Metrics for Comprehensive Stroke Centers
 - Angiography/embolization Quality Measures
 - LOS for Interventional/Operative Stroke
- Possible Requirement for Cardiac Monitoring for all Stroke Patients
 - Capital Impact Assessment being Completed
 - Staffing Impact Assessment being Completed



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Success comes from

- Accountability
- Leadership commitment to using data to assess performance across the hospitals
- Communicating through multidisciplinary teams
- Education and Collaboration
- Recognizing the value of standardizing processes across facilities to reduce variation in care
- Using data to target specific clinical interventions for improved outcomes
- Communicating data from the bedside to the Board of Trustees



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