# THE NEW YORK STATE TRAUMA SYSTEM

## TRAUMA IS A DISEASE

- Accidental Death and Disability: The Neglected Disease of Modern Society was published in 1966 by the National Academy of Sciences
  - 52 million accidents resulted in 107,000 deaths and 400,000 temporarily disabled persons
- Injury in America: A Continuing Public Health Problem was published in 1985 by the National Research Council
  - Trauma was not an insoluble problem

## TRAUMA CARE AS A NATIONAL PROBLEM

- Rural trauma patients have more than a 25% reduced chance of survival
- 21.6 General Surgeons per 100,000 people in rural areas
- 67.2 General Surgeons per 100,000 people in urban areas
- 10.1% of the rural population is within 45 minutes of a trauma center

## TRAUMA SYSTEMS AND CENTERS

- Illinois (1966) and Maryland (1991) developed nation's first statewide trauma networks
- First trauma centers established in 1966 in Chicago and in San Francisco in 1972
- The preventable death rate from trauma is reduced from 33% to 7% when patients go to a trauma center
- Trauma centers reduce the preventable death rate

## TRAUMA CENTERS IN NEW YORK

- Bellevue Hospital is the oldest public hospital – 1736
- The world's first catastrophe hospital – 1941
- First ICU in a public hospital
- Emergency Services for the President and visiting dignitaries when they are in NYC

## DEVELOPMENT OF THE NEW YORK TRAUMA SYSTEM

- The DOH recognized the need for New York to have a trauma system
- NYS trauma experts were polled & agreed that a NYS trauma system was important and needed
- The DOH facilitated a meeting of experts - trauma surgeons, emergency medicine physicians and nurses

## DEVELOPMENT OF THE SYSTEM

- DOH informed hospital representatives and stakeholders that a State Trauma Advisory Committee was being formed
- NYC had a 911 trauma designation system
- The rest of NY did not have any designation system
- The initial focus was to be on Upstate then incorporate NYC into the process

## DEVELOPMENT OF THE SYSTEM

- David Axelrod, MD was the Commissioner of Health
  - Felt that state oversight would help identify and remove negligent or incompetent MDs
  - Felt that DOH was best suited for this task
  - Felt that public reporting of outcomes data would spur MDs and hospitals to perform better

## DEVELOPMENT OF THE SYSTEM

- 1987 NYS developed the formal system of trauma care
- Minimal standards for trauma center designation were written – 708.5
- The regulations were *based* on the then current edition of Resources for the Optimal Care of the Trauma Patient but they were modified significantly

## DEVELOPMENT OF THE SYSTEM

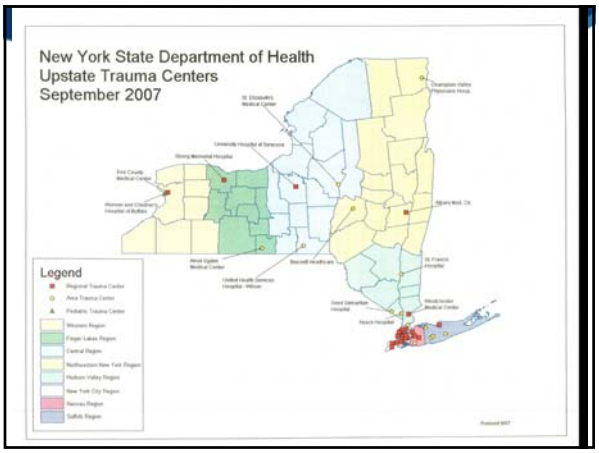
- Trauma Center regulations were completed and were designated to as the 708.5 regulations
- Regional and Area Trauma Center designations were created
- The registry software was supplied only to the Regional and Area Trauma Centers

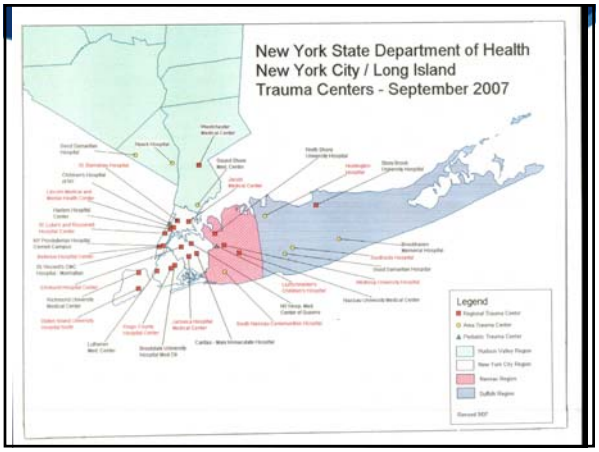
## DEVELOPMENT THE SYSTEM

- A HRSA grant of $1.5 million was obtained to support the program
- The grant was to last for 3 years
- The grant was intended to be seed money for states to develop a trauma system
- The state was expected to continue funding after the grant expired

## DEVELOPMENT OF THE SYSTEM

- 8 regions were created in NYS
- Any hospital could qualify
- 36 hospitals were initially designated
- 1990 saw DOH provide funding to continue development of the trauma system through a HRSA grant
- DOH designated lead facilities based on a competitive RFP




## DEVELOPMENT OF THE SYSTEM

- A State Trauma Registry was purchased by DOH – Trauma One developed by Lancet Technologies
- Trauma centers and non-trauma centers would submit data
- The grant funded the purchase of the registry and data collection (people)
- All hospitals in NYS would "submit" data

# DEVELOPMENT OF THE SYSTEM

- A statewide trauma registry began data collection in 1993
- Registry data included all DOAs, all DIEs, and inpatient admissions ICD codes 800 to 959
- The registry was one of three population based registries in the United States

# STAC

- 1991 – DOH selected members who had helped write the regulations to serve as the State Trauma Advisory Committee (STAC)
- Members came from the 8 regions of the state
- The charge was for the committee to assist the DOH in the Appropriateness Review in evaluating applications for designation

# STAC

- The STAC members were appointed by the Commissioner of DOH and then the Governor
- The STAC was to provide clinical guidance and assist the School of Public Health in data analysis
- The STAC was an advisory body to the Commissioner
- SPH was the data repository

## NEW YORK TRAUMA CENTERS

- The DOH designated trauma centers after reviewing the applications
- There was no verification process during the application process
- The STAC felt strongly that verification was an integral component of the designation process

## NEW YORK TRAUMA CENTERS

- The first trauma center surveys were conducted in 1994
- 15 centers were surveyed
- Surveyor teams were composed of a trauma surgeon, an EM physician and a trauma nurse coordinator
- The HRSA grant supported the surveys

## PROCESS IMPROVEMENT

- The first report of the NYS Trauma System was published in 1994
- Analyzed data from 1991 to 1994
- Data analyzed from SPARCS
- SPARCS data lags calendar year by 18 months
- SPARCS was used to confirm that all appropriate trauma cases were included in the NYS registry

## DEVELOPMENT OF THE SYSTEM

- A complete data set was necessary because the intent was to publicly disseminate hospital and physician specific results
- Data entered by trauma centers was not used
- ICISS
- This was opposed by the surgeons, HANYS and GNYHA
- Not all data was properly coded

## STATE DATA ANALYSIS

- Risk adjustment inpatient mortality rates were calculated
- Difference in inpatient mortality ( Area Centers had lower mortality rate)
- Probably due to the nature of transfers to Regional Centers Upstate

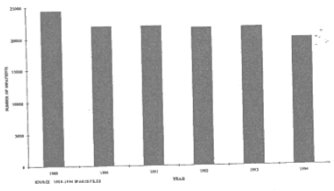
## STATE DATA ANALYSIS

- Data analysis showed weaknesses in care at individual trauma centers and in regions
- "Competition" in the market place forced hospitals to improve their support for trauma care
- The data made the DOH aware of the gaps in trauma coverage in the state
- The DOH realized that "not all hospitals are created equal"

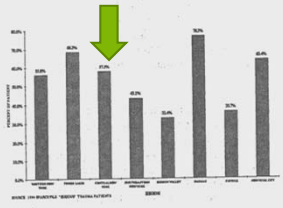
# DATA ANALYSIS

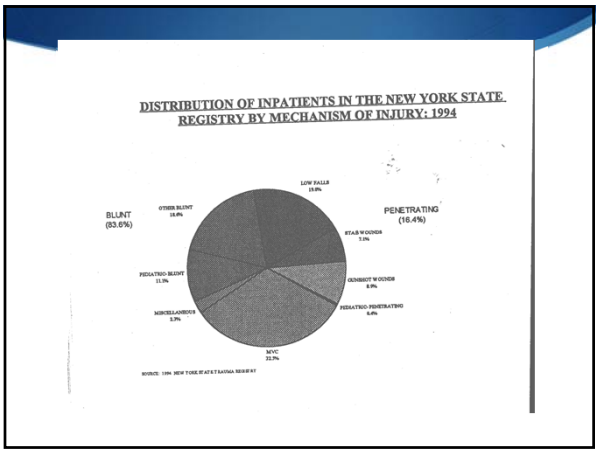
- Some community hospital trauma centers did not meet 708.5 medical staff criteria
- Some university and community hospitals did not meet 708.5 criteria for support staff
- EMS providers did not consistently take trauma patients to a designated trauma center
- Some non-trauma centers "courted" EMS providers to continue to bring trauma patients to them

"SERIOUS" TRAUMA INPATIENTS IN NEW YORK STATE: 1989-1994



PERCENT OF PATIENTS ADMITTED TO TRAUMA CENTERS BY REGION: 1994






## 1994 to 1995

- 1994 – 1995 saw an increase in trauma center admissions from 48.3% to 59.1%
- The inpatient mortality rate decreased from 34.6% to 31.8%
- Inpatient mortality for ISS 16 to 24 decreased by 11% (7.9% to 7%)
- Inpatient mortality for ISS 1 to 14 decreased by 22.9% (3.5% to 2.7%)

## 1994 to 1995

- 33.9% of the patients were from NYC
- None of the other seven regions had more than 11% of the total trauma population
- 87% had blunt mechanism of injury
- MVC accounted for 29.8%
- 12.3% were pediatric patients
- GSW accounted for highest mortality (12.4%)

## 1994 to 1995

- 18% of ED deaths occurred in Regional Centers
- 39% of ED deaths occurred in Area Centers
- There was a great deal of concern since Regional centers did not appear to result in improved survival

## 1994 to 1995

- This was the first documentation that a Regional Center (Level I equivalent) had a different patient population
- Unfair to compare Regional Centers to all other hospitals
- RAMR maybe misleading because injury severity may not be accurately estimated

## 1994 to 1995

- Statistical models were developed for MVC, low falls and other blunt injuries
- Allowed prediction of the probability of dying in the hospital as a function of common risk factors such as ISS, GCS, RR and SBP
- SPH was trying to develop a model that would not need a complete registry

## 1994 to 1995

- Regional Centers tend to have sicker patients triaged to them
- The data is valuable in assessing and improving the quality of trauma care
- The trauma registry was recognized as quality improvement tool by the state

## LOSS OF DIRECTION

- No report issued from 1996 to 2002
- Problems with funding
  - Grant expired
  - BEMS maintained funding through Dormitory Fund
  - Use of the Dormitory Fund was eliminated by auditor
  - New Governor – George Pataki
  - New Director for DOH – Antonio Novello, MD
  - New DOH initiatives

## LOSS OF DIRECTION

- Loss of coordinators and registrars
- Loss of comprehensive data base – non-center data was difficult to obtain
- Dependence on SPARCS to verify registry data
- Paper by Reilly from Kings County questioned the interpretation of SPH and BEMS

## LOSS OF DIRECTION

- Centers dropping out of the system
- No verification visits
- New applications
- Decreasing trauma center volumes
- Frequent change in trauma program staff – directors, coordinators and registrars
- Outdated appropriateness review standards

## LOSS OF DIRECTION

- Registry support lost and now multiple registries used – Trauma One, NTRACS and Image Trend
- Data submitted to NTDB by all registries
- DOH and SPH release report for 1999 to 2002 in 2006
- Mortality for MVC decreased to 8.44% compared to national average of 15.42%

## LOSS OF DIRECTION

- Two regions collected inclusive data – CNY (Upstate) and Suffolk (Stony Brook)
  - Due to determination of trauma coordinators
  - SPH did not analyze community data from registry
  - RTACS in these two regions were functional and focused on regional QI
  - Some community hospitals were reluctant to allow data submission but were persuaded to continue

## SURVIVAL OF THE SYSTEM

- STAC was not a statutorily recognized body in the DOH
- High turnover in STAC membership
- New trauma center in the Bronx
- New Executive Committee
- New BEMS liaison

## SURVIVAL OF THE SYSTEM

- September 11, 2001
- 2002 HRSA and ACS-COT published *Model Trauma System Planning and Evaluation*
- 2006 IOM *The Future of Emergency Care in the US Health Care System*
- Public Health model
- New recognition that trauma care was important

## PUBLIC HEALTH MODEL FOR TRAUMA CARE

## PUBLIC HEALTH MODEL FOR TRAUMA CARE

- The public health principles :
  - Prevent epidemics and spread of disease
  - Protect against environmental hazards
  - Prevent injuries
  - Promote and encourage healthy behaviors
  - Respond and assist communities when disaster strikes
  - Assure quality and accessibility of health services

## NEW LIFE

- New Executive Committee members brought new perspectives and enthusiasm
- The NYS Trauma System and STAC not statutorily recognized
- NYS ACS chapter and changed from a 503(c) organization to a taxable organization so that lobbying was legal
- ATS

## NEW LIFE

- Focused lobbying efforts by ACS and ATS
- Support from both Democratic (Assembly) and Republican (Senate) Health Committee Chairs
- The first two attempts at moving legislation from the Committees to floor were unsuccessful
  - Budget issues
  - Lack of understanding

## NEW LIFE

- State Hospital Review and Planning Council (SHRPC) became involved with a NYC issue – an additional trauma center in the Bronx
- SHRPC requested STAC perform a review of the NYC Trauma System
- NYS had never performed a systems review
- 2005 saw article 30B passed as Emergency Medical, Trauma and Disaster Care Act

## NEW LIFE

- A revision of 708.5 was attempted
- Verification review visits were resumed
- Efforts made to have more current state reports
- NYC trauma centers were lobbying for de-designation of facilities that did not meet the current standard or were redundant

## NYC REVIEW

- First systems review by DOH
- Determine if there is a high quality of trauma care in NYC
- Determine the number of trauma centers required for NYC
- Assessment of accessibility to trauma care in NYC

## NYC REVIEW

- High quality care is provided in NYC but cannot comment on uniformity
- 25% of care is provided by non-trauma centers
- Did not determine how many centers were needed
- Trauma care is accessible to all patients except in southern Kings County

## NYC REVIEW

- DOH accepted the view that trauma care is a public health problem
- Problems with trauma patients going to non-centers and lack of outcome data
- Inability to determine if there were too many trauma centers in NYC
- Conflict among stakeholders – FDNY, GNYHA, HHC

## NEW LIFE

- 1999 to 2004 report released in 2006
- Data was stale
- Users of the report (legislature and DOH) were unhappy with time delay
- Findings were helpful in determining the direction the system should take

## 2012

- Meeting with the Commissioner of Health, BEMS, senior DOH members and STAC
- The need for support from state to STAC to complete revisions of 708
- The option of using VRC verification was discussed
- March 2012 the state decides to use VRC

## ACS - COT

- Level I, II, III and IV centers
- Verification based on the capability of the hospital to support the trauma program
- Level I and II essentially the same
- Level III has longer response times
- Level IV has a trauma team

## THE NEED FOR MORE TRAUMA CENTERS

- Large areas of state without trauma care
- Reduced number of general surgeons
- Lack of infrastructure
- Hospital cost

## THE FUTURE

- New report is to be released
- Goal is to maintain and improve outcomes
- Provide adequate resources for NYS
  - NYC review revealed 19 neurosurgeons providing care to 19 hospitals
  - Upstate NY has lost Orthopaedic and Neurosurgery coverage – centers have closed

## THE FUTURE

- NYS physician deficit issues are mandating a new approach
- BEMS staffing
- ACS- COT verification process to be considered as the trauma center verification regulations
- Better trauma care for all New Yorkers