A Case for Evolutionary Change:
Collection of Emergency Department Data in New York State

Bob Davis, February 3, 2004

The lack of useful, available data on emergency department services in New York State has significantly challenged physicians' abilities to develop plans and strategies for meeting the needs of individuals who rely on such services. There was a strong need for an enhanced data collection system for emergency department data. This paper describes the evolution of such a system in New York State, including its authorization, development, testing and implementation.

Legislative History

In 1999, 6.5 million people visited the emergency departments of New York State. We know very little about these encounters. We do not know why these people came to emergency departments, nor do we know what services they received. We do not know the age, race, or gender of the people using these services, and we do not know the areas in which they lived. We know very little about the quality of care they received or the specific costs associated with their care. This shortage of useful data hinders our ability to plan effectively to meet the health care needs of our citizens.

This shortage of data made it difficult for one particular emergency department physician in the metropolitan New York City area to care for minority youth with asthma.   This physician made a case with his local state legislator, who in turn embraced the need for better data and initiated the process to enact legislation to authorize the New York State discharge data system, the Statewide Planning and Research Cooperative System (SPARCS), to collect the data.

The next task before the legislation could move forward was to solidify support from the two hospital associations in New York State, Greater New York Hospital Association (GNYHA) and Healthcare Association of New York State (HANYS).   From the beginning, both hospital associations understood the value of such data and philosophically supported the collection of these data.   However, as with the design of any great building, "the devil is in the details." Neither hospital association would support the legislation until more information was made available on how such a system would be implemented.   Both organizations made it clear they could only support this legislation if implementation of the data collection system was sustainable with existing resources, did not impose a submission burden, and did not affect hospital workforce needs (i.e., the system was "work force neutral").

In addition, during preliminary discussions with the New York State Department of Health (NYS DOH), the GNYHA indicated that it would support this legislation only if the implemented solution was compatible with the Health Insurance Portability and Accountability Act (HIPAA).   The exact quote was "if you use the [837] standard, we support it."   It was the NYS DOH's promise that the system would be developed using the 837 standard that solidified the support of the two hospital associations, which was critical to passage of this legislation.

Legislation Becomes Law

Both branches of the New York State Legislature unanimously passed the legislation and Governor Pataki signed the bill into law on September 4, 2001. The legislation started as Assembly Bill 1644, and added a new Section (2816) to the Public Health Law after the Governor signed it into law.

The law mandated the collection of emergency department data through the Statewide Planning and Research Cooperative System (SPARCS) beginning September 2003. However, the legislation did not provide details about how the mandated emergency department data collection system would be implemented. The legislation did not specify what data elements should or should not be included in the system design. The legislation did not specify any data content or format standards. The supporting regulations tasked to the NYS DOH would provide the implementation details.

It is important to note that the events of 9/11 and the subsequent anthrax events that same fall had no impact on the passage of this legislation in New York State. The need for the data was recognized before those events changed the landscape of our country, but the need was certainly underscored by those events.

Implementation Process for the New Law

From the first moments that legislation authorizing the NYS DOH to collect emergency department data was proposed, there was a great deal of excitement generated by a vast array of potential users of an emergency department data collection system. The NYS DOH was tasked with designing a system that satisfied the needs of the litany of potential data users, was sustainable by existing hospital information systems, and was "workforce neutral."

Executive staff at the NYS DOH directed SPARCS staff to form an internal Work Group for the purpose of:

- identifying NYS DOH data needs from an emergency department data collection system;

- developing system design proposals;

- developing industry outreach strategies to solicit comment and support for proposed system designs; and

- drafting supporting regulations.

Both the funding and the timing of the new mandate set limits on the system's design and implementation. When the Work Group began its efforts, the legislation was an unfunded mandate. The expectation was that existing resources would be enough to implement the system. From a development team perspective this meant that from the outset of the discovery and design process, the scope of the data system needed careful consideration and control.

In terms of the timing, HIPAA requirements, specifically the HIPAA claims transaction standard, imposed limits on the scope of the system. The state legislation implementation date for the New York State Emergency Department Data Collection System was close to the

implementation date (October 16, 2003) for the HIPAA transactions and codes rule.   The Health Care Claim standard named in the federal HIPAA legislation was the ANSI ASC X12 837 transaction set. Because the SPARCS system, like many other state discharge systems, has always been a derivative of hospital billing and medical records system, the logical limiting factor to designing the system was the HIPAA claims transaction standard.

This factor enabled the Public Health Data Standards Consortium to convince the ANSI ASC X12N organization to approve development of the Health Care Service: Data Reporting guide. This guide mined the data elements from the robust 837 standard that were identified by many states as necessary for public health reporting systems.   This work would prove to be critical for the development of the New York State emergency department system.

To maintain industry support, the DOH Emergency Department Work Group agreed to limit the scope of the initial design to the capabilities of the 837 standard. In early discussions Work Group members speculated on the utility of some elements that were not supported by the 837 standard. The analogy that convinced the Work Group to agree to limit the scope to the ANSI ASC X12 837 standard and in particular the Health Care Service: Data Reporting guide implementation of the standard was:

> Right now what happens in the emergency room is a dark room to us. It is better for that first entry into the room to happen with a flash light so we can best learn how to fully light the room in the future.

It is clear that the DOH Emergency Department Work Group understood the importance of maintaining industry support for this project, even at the expense of some potentially valuable data elements that may not have been supported by the standard. Implementing a data collection system for 6.5 million yearly records at best would be a daunting task, especially as an unfunded mandate. Successful implementation depended on existing information systems.

Although the Work Group agreed on the limited scope of data elements, during early discussions Work Group members, who represented a wide cross section of Department programs that would be using the data, disagreed on which data elements to include. The 837 standards as implemented by the Health Care Service: Data Reporting guide was still a very robust standard. It was obvious that unless a defensible strategy was adopted for inclusion or exclusion of each data element, the Work Group would face contentious outreach meetings with the industry.

To avoid this situation, the Work Group developed an alternative strategy for developing the emergency department specifications document that needed to be included in the supporting regulations for this system.   Rather than suggesting a list of needed data elements, each of the NYS DOH program areas compiled a list of questions that data collected via the emergency department data collection system needed to answer for their purposes.   The list of questions from each program area was then consolidated into one list. The next step was to crosswalk the questions to data elements in the 837 standard that would be used to answer the questions. This strategy provided the industry with the opportunity to question the validity of the question or the validity of the assumptions about which data elements would answer each question. This strategy highlighted the important uses of the data instead of emphasizing any

potential burdens this data collection system might place on the hospital industry in New York State.

It is significant that the DOH Emergency Department Work Group agreed that any data element not needed to answer one of the task statement questions[i] would not be included in the specifications document. The Work Group agreed that this was an important decision in soliciting provider trust early in the development cycle. In order to control the scope of the project, it was also in the Department's best interest to collect only the data elements needed for department purposes.   From the onset of the legislation, the hospitals were concerned that the emergency department data collection system needed to be compatible with their information systems.   The strategy employed was designed to balance the needs of the potential data users with the capabilities of the data sources.

The Work Group produced a series of documents that provided an initial design for the emergency department data collection system, along with justification for the proposal that could be presented to the hospital industry for comment.   Work Group documents include the following:

- Emergency Department Data Specifications Document: This document listed each proposed data element along with definitions and planned edits.

- Task Statements: This document listed the consolidated questions developed by the NYS DOH program areas. These questions highlighted how the program areas planned to use the emergency department data when it becomes available.

- Element and Task Matrix: This document cross references the proposed elements with the questions to be answered by those data elements.

- Data Element Justification: This document provides additional information on how each data element will be used as further justification for its inclusion.

These documents are available at the following web site:

    www.health.state.ny.us/nysdoh/sparcs/eddoc.htm.

Implementation Schedule

The law mandated data that be submitted prior to September 4, 2003.   The Work Group identified two phases to achieve its goal of designing and implementing a system that allowed for data collection by the mandated submission date. Phase One of this project was the testing and implementation of necessary changes to the existing Ambulatory Surgery Data system. Since ambulatory surgery services and emergency department services are both considered outpatient services by hospital information systems, it was necessary to make consistency changes to the ambulatory surgery system. Phase Two of this project was the testing and implementation of the actual emergency department data collection system.

In order to meet the September 4, 2003 deadline, the Work Group developed a series of milestones, listed below. Also included are the timelines when each of these activities took place.

- NYS DOH Work Group activities – Began September 2001

- Industry Outreach Meetings (Round 1) for comment on proposed system design – Conducted throughout the Spring of 2002

- Industry Outreach Meetings (Round 2) to finalize the system design – Conducted throughout the Late Summer and Fall 2002

- System development activities – Began in October 2002

- Industry Outreach Meetings (Round 3) to train industry hospitals on the particulars of the data collection system – Began in late Fall 2002 and extended throughout the Spring of 2003

- Phase One testing – Began in late November 2002

- Phase One implementation – Began on January 1, 2003

- Phase Two testing – Began in March 2003

- Phase Two implementation – Planned to begin on September 4, 2003, but actually began in July 2003

The remainder of this section presents highlights from each of these activities.

Outreach Meetings: Round 1

Armed with the documents developed by the DOH Emergency Department Work Group, the hospital associations sponsored a series of meetings around the state to discuss the proposed system design. A summary of those first outreach meetings is in a Frequently Asked Questions (FAQ) document on the SPARCS web site.

www.health.state.ny.us/nysdoh/sparcs/eddoc.htm

Below are the significant highlights from the Round 1 outreach meetings.

- Meetings were attended by a cross section of the industry including, ER physicians, ER nurses, hospital administrators, hospital medical records coders, hospital billing staff, and potential data users.

- A common message from across the state was that Emergency Department data were already included in inpatient data sent to the NYS DOH and changes to that system would be burdensome to hospitals providing emergency services.

- Another common message from across the state was that those emergency cases not admitted as inpatients are part of the outpatient billing systems, as are ambulatory surgery visits. For this reason, mandating a separate emergency department submission would be burdensome to hospitals providing emergency services.

- At all outreach meetings, there was strong support for implementing a HIPAA- compatible solution using HIPAA data content and planned support for HIPAA formats.

- At all outreach meetings, there was a strong appeal that different outpatient services be identified by existing UB revenue codes.

- There were considerable regional differences in the definitions of some of the proposed data elements.

- All regions' industry representatives requested an opportunity to comment on changes resulting from industry input.[ii]

- At the end of each outreach session the industry expressed appreciation for the Department's sensitivity to hospital capabilities in the proposed system design.

Outreach Meetings: Round 2

The second round of outreach meetings targeted groups or organizations that voiced dissent on the proposed emergency department data collection system. In particular, the meetings addressed the specific issues that prevented industry consensus.   The controversial issues focused on data element definitions (i.e., meaning of the data in an emergency room setting). Of note, though the discussions brought-out disagreements in the way data elements were defined, the larger questions about data use never created controversy.   We have to assume the reason for that was the task statement questions that were employed by the Emergency Department Work Group were able to alleviate the larger questions about the underlying reasons for each data element included in the proposed data collection system. This "question centered" justification strategy was an attempt to focus on the questions to be answered by the data rather than each of the data elements in isolation.

Below are the data elements that were questioned along with a brief description of the controversy:

- Admission Hour – The question was whether Admission Hour is when the patient is triaged or when the admissions clerk conducts an interview. Round 1 of the outreach meetings indicated that there is not a uniform definition of Admission Hours across the state.

- Discharge Hour – The question was whether the Discharge Hour is when the patient left the hospital or when the physician signs the discharge order.

- Physician Definitions – The question was how to classify emergency department physicians. The inpatient and ambulatory surgery definitions for attending, operating, referring, or other physicians do not apply in the emergency department setting, since emergency room doctors work shifts and there is no single doctor responsible for the care of an individual.

- Principal /Primary Diagnosis - This question again was raised because of the nature of care provided in the emergency department.[iii]

- Principal /Primary Procedure Code - This question again was raised because of the nature of care provided in the emergency department.[iv]

Each of the definitions for the above data elements is included in the Final Specifications document at the following URL:

www.health.state.ny.us/nysdoh/sparcs/eddoc.htm.

An interaction between the New York College of Emergency Physicians (NYCEP) and the NYS DOH Emergency Department Work Group best illustrates the work that occurred during the Round 2 Outreach Meetings. NYCEP voiced concern that emergency department physician data would not be interpreted correctly. Since a patient's stay in the emergency room could span several emergency department physicians' shifts, any interpretations of the data about the

quality of care would need to include all doctors responsible for the patient's care. This stimulated a particularly interesting discussion because there was even disagreement within the physician organization on this issue. The Work Group's role in resolving this dispute was one of a mediator. The final resolution was simple—to provide alternative definitions for the emergency department physicians. The attending, operating, and other physicians were defined as physician 1, physician 2, and physician 3 respectively for the delivery of emergency department services.

System Development Activities

The NYS DOH based development of the emergency department data collection system on a hybrid of existing code from the current inpatient and ambulatory surgery systems. It was not necessary to generate a significant amount of new code; rather, the code was extracted from existing processes, and had been tested and refined over the previous nine years through routine interactions with the health care industry in New York State. Consequently, the testing cycles for the hybrid system are expected to be shorter than if more original code was necessary.

A significant amount of new code was unnecessary largely because in 1994, the NYS DOH rewrote the SPARCS system to use UB-92 data standards. Thus, before HIPAA, the NYS DOH was already using the data content that would later become HIPAA requirements. When the legislation authorized the collection of emergency department data in 2001, the legacy system was already HIPAA-compatible. All of the basic edits and the current de-facto data format were solidly in place. However, the current ambulatory surgery data collection system did not collect all of the data elements necessary for identifying a second kind of outpatient service (i.e., emergency department visits). Consequently, changes had to be made to collect these data. Although these changes impacted the outpatient output formats necessary for data use, the similarities between the long standing edits used for inpatient submissions and the planned edits for emergency department data drastically reduced the need to develop new code for emergency department data. Because emergency department data were considered outpatient services along with ambulatory surgery service data, the data submission format did not have to change.

To be completely HIPAA-compatible, the system also needed to accept an ANSI ASC X12 837 as implemented according to the Health Care Service: Data Reporting guide. The NYS DOH contracted with a translation vendor to map the 837 input format to an application friendly format which, for New York State, is the current UB flat file format. Outsourcing this aspect of the system freed up internal resources to dedicate the entire fall of 2002 on the necessary programming for the backend production system to incorporate emergency department data into the existing ambulatory surgery master files.

The system development activities can be summarized as an evolutionary, rather than revolutionary process. By the time the legislation took effect, the system development stars were already aligned. The data content and formats had been implemented in prior years. The major impact of the legislation was to ramp up for additional capacity. Neither the base NYS DOH system nor the provider systems needed significant changes to collect emergency department data. Though still a daunting task with no additional funding, successful system implementation was attainable.

Outreach Meetings: Round 3

From the beginning of this project, the hospital industry understood the need for and was cooperative in providing constructive and valuable input into the system design.   The third round of outreach meetings across the state was designed to provide the industry with necessary system training on when and how to send the Department the mandated emergency department data. This training was sponsored by the New York Health Information Management Association (NYHIMA), whose members are the line personnel typically responsible for submitting SPARCS data to the Department.   Throughout the system's development, a great deal of effort was expended looking for partners to become involved in the process. The relationship between NYHIMA and the NYS DOH is yet another example of a partnership that was formed as part of the development cycle.

Phase One Activities

Phase One represented activities designed to change the existing ambulatory surgery data collection system.   To lessen any potential burden on the hospital industry, all outpatient submissions, which includes ambulatory surgery and emergency department visits, were aligned with SPARCS. This was one of the principle lessons learned from the outreach meetings.

Phase One represented the most extensive programming change for the SPARCS system, since several additional data elements needed to be added along with an expansion of the current outpatient output file.   Below are the URLs for documents detailing the changes and documentation for the expanded outpatient output file layout.

- www.health.state.ny.us/nysdoh/sparcs/pdf/chng2002.pdf; and
- www.health.state.ny.us/nysdoh/sparcs/outpat.htm.

Given that the designed system was HIPAA-compatible, these changes where hoped to be less burdensome for the hospitals. The SPARCS system underwent significant changes when the HIPAA legislation was first passed to use the code sets named in the HIPAA law. Interestingly, those hospitals that previously had their vendors or in-house programming staff write special code to satisfy the letter of the SPARCS requirements, which did not include all the code sets named in the HIPAA legislation, had more difficulty adapting to the year 2003 changes. It has always been a feature of the SPARCS system to ignore data sent in the standard formats that were not required by SPARCS.   This included those code sets named in the HIPAA legislation. The principle of "ignore, don't reject" enabled SPARCS to use payer formats and data standards without significant modifications.   Providers that sent the data necessary to pay outpatient claims to SPARCS prior to 2003 had little or no programming to do when SPARCS too would now need more of the data needed to pay a claim. These providers were already sending the HIPAA code sets to SPARCS that would now be necessary as part of the emergency department collection system.

Hospitals needed about four months to reconcile system differences and programming anomalies for the submission of required 2003 ambulatory surgery data to SPARCS. During the time when hospitals were beta and general testing phase one data submissions, the SPARCS

programming staff was re-formatting the prior years outpatient output files to the expanded 2003 output format. Past experience has shown that use of the file is simplified and increased when the format and content of the data files are consistent across all collection years.

Implementation of Phase One system changes was a triumph for the use of data standards in an evolutionary, rather than revolutionary way. Implementing HIPAA- compatible changes fit into the hospitals pre-established work plans as well as being well understood by all providers.

Phase Two Activities

Phase Two represented the collection of emergency department data, which was designed to and turned out to be a smooth and easy process. Most typically, once a hospital successfully completed Phase One testing, it passed Phase Two testing on the very next submission. Interestingly, early in Phase Two activities hospitals asked the SPARCS Unit to implement the production system sooner than the September 4, 2003 requirement. For those hospitals that successfully tested emergency department data, they found it more burdensome to separate the two different types of outpatient data than to combine it. Because of their request and SPARCS's agreement to turn on the emergency department production system early, hospitals did not have to separate their data.

Summary

The SPARCS system was built on a tradition of uniformity and commitment to consistency. The original SPARCS system design was one of the first discharge systems built on the concept of a uniform billing form (UBF). The early success of the UBF in New York State provided the road map for the development of a national UB form. In the early 1990s, the nation migrated to a new version of a uniform and consistent billing form: UB-92. At that time, New York State chose to migrate along with the rest of country to the national standard. It was fortunate that in 1996, the HIPAA legislation also chose to make the UB-92 data specifications the foundation for a national standard. These events created an environment of evolutionary change.

Grounded in the notion that standardization is good, New York State steadily increased the scope of the standards being applied to go beyond its state borders. This roadmap of evolutionary change has always been followed by the keepers of the SPARCS data system.

The national experience with HIPAA implementation is a graphic example for the advantages of evolutionary change over revolutionary change. It is clear that some systems have been able to develop, test, and implement HIPAA-compliant systems well before mandated deadlines. The evidence suggests that this was possible because the necessary system cornerstones were laid many years before. It would be interesting to compare some successful HIPAA implementation efforts from some unsuccessful ones.

To outside observers, the SPARCS development, testing, and early implementation of the emergency department data collection systems was a large dose of magic. This paper suggests that success was more a function of a longstanding commitment to standards. The authorizing legislation passed before the nation experienced the events of September 11, 2001. The implementation was expected at a time of huge state and national budget deficits. This success story would not have been written if the SPARCS system:

- stayed a state proprietary standard;

- had needed to make significant changes to become a HIPAA compatible system, or had not coincided with the state mandate to collect emergency department data; and

- had not joined forces with the provider community for an evolutionary adoption to changes in the health care deliver system.

Like the story of the singer, dancer, artist that becomes the overnight sensation, what is left untold is the years and years of hard work prior to the moment of discovery. The same is true on the telling of this success story. Years and years of careful planning and an unwavering commitment to standards have made the SPARCS system ready for the building of an emergency department data component during a time of fiscal crises, but at a time of great need for the data. The purpose of the telling this story is to provide inspiration for other stories in other parts of the country in the future.

Endnotes

[i] A series of task statement questions were developed by NYSDOH program areas to represent how the emergency department data would be used.

[ii] Both hospital associations (GNYHA and HANYS) agreed to serve as arbitrators between their member hospitals and the NYS DOH to resolve regional definition differences. GNYHA would arbitrate in NYC and HANYS would arbitrate for its members upstate. Both associations played a significant role in resolving regional and definitional differences in the proposed system.

[iii] Emergency and inpatient care departments consider different issues in coding diagnosis and procedures. For example, a gun shot wound victim would be given a Principle Diagnosis of "Gun Shot Wound" in the emergency room. However, when the victim was transferred to an inpatient bed, a Primary Diagnosis would be given for the victim's collapsed lung experienced as a result of the gun shot wound.

[iv] Ibid.