



**HIT Policy Committee
Privacy & Security Tiger Team
Patient Linking Hearing
Panel 3**

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Presentation by Surescripts, LLC

Presented by:

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My name is Paul Uhrig, and I am Surescripts' Chief Administrative & Legal Officer; Chief Privacy Officer. Also presenting with me today is Mark Gingrich, Surescripts' Chief Information Officer. We thank the HIT Policy Committee – Privacy & Security Tiger Team for the opportunity to comment on our experiences with patient matching as part of our network operations.

Surescripts created the first and largest nationwide health information network with e-prescribing as its anchor service. We connect and enable pharmacies, payers, pharmacy benefit managers (PBMs), physicians, hospitals, health information exchanges and health technology firms to easily and securely move health information. By securely and reliably providing health information during emergencies and routine care, Surescripts is committed to saving lives, improving efficiency, and reducing the cost of health care for all. Our success is the result of the vision and support of the nation's pharmacies and PBMs and the contributions that have come from a diverse set of constituents and ideas.

The Surescripts network connects over 200,000 prescribers, over 55,000 community pharmacies, six of the largest mail order pharmacies, and over 25 of the nation's largest PBMs for the purpose of exchanging prescription-related information in the ambulatory setting. Today, Surescripts provides access to prescription benefit and history information for more than 65 percent of patients in the United States on behalf of payers and pharmacies and approximately 90 percent of community pharmacies in the United States are connected for prescription routing. More than 250 technology vendors' systems have been certified to connect to and access the Surescripts network. (For a specific listing of vendors and certification status, please visit <http://surescripts.com/connect-to-surescripts.aspx>.) Surescripts is privately owned: the National Community Pharmacists Association (NCPA) and the National Association of Chain Drug Stores (NACDS) own 50 percent with the balance split evenly between CVS Caremark, Express Scripts and Medco Health Solutions. Surescripts is headquartered in Arlington, VA, with major technology operations in St. Paul, MN.

As creators of the first and only nationwide means of electronically sharing health information, we feel a responsibility to state clearly and plainly who we are and what we believe. We do this by publicly stating our principles. Surescripts' principles both outline our philosophy as an organization and enable connections between the nation's health care participants.



- **Security and Privacy.** We constantly review and update all procedures and technology to guarantee the integrity of our system and to ensure everyone's privacy is protected. More information can be found at <http://surescripts.com/about-us/commitment-to-privacy.aspx>.
- **Neutrality.** Surescripts implements and consistently applies objective standards for certification and implementation of technology systems that promote an open, neutral network and interoperability.
- **Choice.** Surescripts' network is designed to support patient choice of pharmacy and prescriber choice of drug therapy. Commercial messaging is not allowed on the network. In addition, our choice to focus on the certification of e-prescribing and EHR software — and not its development or sale — helps ensure a wide choice of options for providers.
- **Transparency.** Our policies are made public to current and potential network participants through extensive participation in government and industry workgroups and through Surescripts own workshops and documentation.
- **Collaboration.** Surescripts works throughout the healthcare community to develop educational programs, quality initiatives, and certification standards, and to promote dialogue to support the future growth of e-prescribing and health information exchange.
- **Quality.** Making health information electronic is not enough – it must be accurate. Through our quality program, we measure, analyze and take action to ensure the accuracy and reliability of prescription information, from the time the prescription is prepared to the time it is dispensed.

Surescripts recently announced that it will expand its nationwide e-prescribing network to support and enable the electronic exchange of all types of clinical information, including up-to-date summaries of patients' recent visits with their health care providers. By enabling e-prescribing as well as the secure electronic exchange of clinical information, Surescripts services may enable the meaningful use of electronic health records. Taken together, these capabilities help improve health care quality and safety while reducing the cost of care. Importantly, Surescripts supports all federal and state policies and standards for health information exchange – including privacy and security standards (such as HIPAA and state law), technology interoperability standards (such as NHIN Exchange) and message types such as HL7, CCR, and CCD. In addition, Surescripts is also following the Privacy and Security Team's recommendations adopted by the HIT Policy Committee and the standards being developed by the NHIN Direct Project. As such, the announcement was recognized by experts throughout the nation's health care system.

Surescripts' Prescription Benefit service puts eligibility benefits, medication history, and formulary information at a prescriber's fingertips at the time of prescribing, enabling prescribers to select medications that are on formulary, are covered by the patient's drug benefit, and will not negatively interact with other medications the patient is identified as taking. Surescripts



enables providers to access a patient's medication history during the patient's office visit by aggregating patient medication history from pharmacy dispensed data and payer medication claims data.

Surescripts' Medication History service enables emergency care providers in the acute care setting to access critically important information on their patient's current and past medications and assists the provider to become better informed about potential medication issues and improve patient safety and quality of care. Patients' medication histories may be used for medication reconciliation support for patients being treated in inpatient settings as well.

An integral part of our operations is the ability to identify and match patients to their insurance eligibility, benefit, and formulary records and to provide medication history to the requesting health care provider. All requests and responses for medication history and eligibility are pursuant to NCPDP standards and ANSI X12 standards, respectively, adopted by CMS under the Medicare Modernization Act. At a high-level, pursuant to the NCPDP and ANSI X2 standard message, prescribers submit patient-identifying information (name, date of birth, zip code, and gender) in a medication history or eligibility request. In order to facilitate the proper and correct response to that request by participating payers and pharmacies, Surescripts utilizes the demographic information provided in the request to match the individual to his/her pharmacy and PBM records by searching what is referred to as a master patient index ("MPI"), described in greater detail below.

The MPI is a collection of membership and patient demographics that is provided from each payer of the drug benefit, PBMs, health plans and pharmacies participating in the Surescripts network (Data Participants). The demographic information is updated on a daily basis by the Data Participants with updates on 20-30 million members per day during high enrollment periods. When a request for medication history or eligibility data is made, the MPI returns either a "patient found" or a "patient not found" response.

If a patient is found, then in the case of an eligibility request, the MPI matches the patient with a payer-assigned unique identification number for payer information and forwards the eligibility benefit request to the PBM. The PBM uses the patient demographics and the payer-assigned unique identification number to confirm that coverage exists, and to retrieve and return benefit coverage information. In the case of a medication history request, if a patient is found, the MPI matches the patient with database keys that are used to retrieve the medication history records. Such records are then transmitted back to the requesting treating provider.

If a patient is not found, then a message is sent back to the requesting provider stating that the patient was not found and no data is available.

More specifically, the MPI runs on a mathematical algorithm that electronically compares submitted patient data to demographic information stored in the MPI. The technology produces a proprietary probability score to "match" patients based on pre-determined and weighted factors. A threshold must be met in order to generate a patient found response and return associated records to the requestor.



For example, let's assume that a treating provider submits an eligibility request for patient John Smith. Mr. Smith is a male born on January 1, 1990, and is currently living in zip code 20036. This information is entered into the MPI and compared against the payer records. If the MPI has a record for a male Jon Smith who is born on January 1, 1990, and currently living in zip code 20036, the probabilistic score that this is a match is high and the request will generate a patient found response. However, if the MPI has a record for Jon Smith who is born on February 1, 1990, or is currently living in a different zip code, the probabilistic threshold cannot be satisfied and a patient not found message will be returned to the requestor.

The foregoing is a simplistic example and there are variances to the above example, but this example demonstrates the process by which the MPI identifies and matches patients. Surescripts highly values patient confidentiality and safety and, as such, we established a high probability threshold in the MPI that will always err on the side of caution. As a matter of best practices, Surescripts strongly encourages that the requestor review the retrieved information from the MPI match to ensure that the information returned matches that requested.

Per your request, we compiled information in response to the Tiger Team's specific questions posed for Panel 3.

1. What are your standards for identifying individuals?

We are not aware of a single or uniform industry standard for identifying individuals. Different industry standards and message types are utilized for identifying individuals. For example, the Integrating the Healthcare Enterprise (IHE) technical framework utilizes the Patient Identified Cross-Reference HL7 V3 (PIXV3) and Patient Demographic Query HL7 V3 (PDQV3) standard for identifying individuals. Surescripts utilizes specific required fields in the transmittal message (an HL7, X12, or NCPDP message) to match patients, supporting standards adopted by CMS.

The requestor inputs the patient's name, date of birth, gender and zip code into the requestor's EHR. Social security numbers, license numbers and the like are not used by Surescripts to identify patients. The EHR sends the message to Surescripts and the MPI then matches the information provided to a unique patient identifier. With respect to payer information, Surescripts receives patient information from payers and the payer's unique code for each patient. With respect to pharmacy information, such information is queried by Surescripts based on foreign keys stored in the MPI unique to each patient. The information from the requestor and payers/pharmacies are compared and, if the information meets the thresholds established, the software determines a match exists.

The MPI runs based on an algorithm tuned to Surescripts' specific needs and accounts for mistyped fields. For example, the algorithm has the ability to conduct "derivative" search such that if the patient's name does not precisely match the payers' or pharmacies' records, searches and comparisons are done on variations of the name (e.g., phonetic matches, common nicknames and edit distances).

If the comparison score exceeds the match threshold, the software produces a "match" result. As previously discussed, a "match" is defined by a mathematical process, using assigned

weight values, which produces a high probabilistic score indicating that the returned records are the records intended for the patient.

Some patients may have multiples records. For example, if a patient is married, coverage may exist under both his/her employer's and spouse's insurance plans. The MPI would then return two "hits" on the patient and would return results for both hits. Conversely, some patients may not have any records and a patient not found message would be returned to the prescriber requestor (e.g., an uninsured patient).

2. How can you be sure that you are accurately linking a patient with his/her data?

Surescripts highly values and strives to maintain patient confidentiality. As such, the MPI is structured patients to their data with a high degree of certainty. Although absolute accuracy cannot be guaranteed, Surescripts has confidence in the MPI based on our significant and ongoing analysis since we implemented this functionality in 2002. We analyzed approximately 50 million PBM patient benefit records to determine the fields and data elements to most accurately match patients. We also conducted extensive research and maintenance of appropriate indexing or bucketing of patient information for this search functionality. Surescripts also regularly tests the MPI for quality—conducting test cases for accuracy and testing the algorithm. This testing provides for quality results and continuous improvement opportunities.

In order to further protect patient confidentiality and integrity of results our system generates, we have structured the MPI to "dynamically link" patients to their records (as opposed to static linking). What do we mean by dynamic versus static linking? Static linking generally refers matching and grouping of records when being loaded into the database, creating a bundle of records. If a patient matches to one record in the bundle, the entire bundle is considered a match. In contrast, dynamic linking requires that each record must individually constitute a match. In seeking to protect patient confidentiality and to promote quality of patient care and safety, The MPI matches patients to their records based on dynamic, not static, linking.

Additionally, once the patient is identified, Surescripts' Application Certification Requirements require the display of demographics and benefit information for confirmation by the application user of the patient match. Demographic differences in the content of the request and response transactions must be indicated to the user. For example, a provider may ask his or her patient to confirm that the patient has coverage from a particular insurer. If the patient confirms the coverage, the provider further ensures that the match is accurate.

3. What problems are you having with patient-matching, internally and/or for information exchange? What is the source of those problems?

- a. How do you handle patient matching problems (wrong/ambiguous match)? What should be done when there is no match although one was expected?**
- b. In your experience, what are the consequences of a wrong match?**

Because the MPI relies on statistical measures, *absolute* certainty in patient identification is not attainable. The accuracy of the MPI depends on data completeness, quality of data, and the number of records. The number of records is important to provide weight calculation in the software's threshold because frequency of data value is inversely proportionate to its weight in

the scoring process. For example, “Mary” is the most common first name in the US population. Therefore, it has a very low weight. The weight values are calculated based on their frequency within the records in the database. In certain cases, the MPI will return a patient not found message because the statistical threshold we require is not met, based on the information available at the time of the search—a false negative result. Alternatively, the MPI could return a mismatched record—a false positive result. Because we want to avoid false negative results as much as possible, we require a very high probabilistic match to return records to a requestor.

In our view and experience, based upon the algorithms established, the risk of a false positive response is extremely low. In the past nine years, ten false positive events (out of approximately 1 billion requests to the MPI) have been reported to our customer service desk. In response to such notifications, Surescripts modified the MPI by tuning the weights used to compute the probabilistic score used to determine if a match exists. To date this year, we have received 160 logged MPI inquiries, mostly regarding why insurance coverage was not found – a false negative result. In 2009, we processed 268 million eligibility requests, matching those to 192 million benefit coverage records, and through November 2010, we’ve processed 534 million eligibility requests for 380 million benefit coverage responses. In addition in 2010, we’ve processed 73 million medication history requests through the MPI, returning history results for 29 million of those requests. Given the foregoing, we believe the MPI has sufficient safeguards to ensure patient privacy and safety.

False positive and false negative results may occur due to a number of reasons—outdated information, misspelled names, translated names for which the English alphabet produce varying results, transposed letters or numbers, etc. Surescripts actively seeks to reduce any potential false positives and false negatives by seeking updated information from connected payers, PBMs and pharmacies on a daily basis and establishing a high threshold for patient matching. To ensure patient confidentiality, we set a stringent match threshold in the MPI that results in a higher level of false negative results but reduces the level of false positive results. Payers and PBMs can also apply their own business logic as an additional security measure.

If, however, a problem occurs, we encourage network participants to contact customer support to update information or report the problem. For example, if a requesting prescriber receives a patient not found but knows that the patient has coverage, the request prescriber may contact Surescripts’ customer support team that will then investigate the issue and work with the payers to correct the information.

4. What level of accuracy do you establish for patient matching?

Please see our responses to Question 3 above.

5. What lessons learned do you have from solving this problem?

Please see our responses to Question 3 above.

6. What are the cost implications of various solutions?



Costs for such solutions can be significant and are associated both with the cost of licensing a solution and implementing and maintaining the solution and the attendant infrastructure. Information is updated on a daily basis and quality checks and other ongoing maintenance all contribute to the cost implications.

7. What should ONC do to address patient matching problems in information exchange?

Surescripts believes that uniform standards for name translations and updating of source information would improve the patient matching processes currently utilized in private sectors. We believe that completeness of data and timely updates/maintenance of such information is a key component to accurate and safe patient matching. We urge ONC and the Tiger Team to continue their important inquiry into such querying processes given ongoing developments and innovation in the exchange of health information.

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Thank you for the opportunity to share our experiences with patient matching in the exchange of prescription information across the Surescripts network with the Tiger Team today. We welcome any questions.