# Use Case Summary

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| **Use Case Name:** | Common Key Service |
| **Sponsor:** | Michigan Health Information Network Shared Services (MiHIN), Michigan Department of Health and Human Services (MDHHS), Blue Cross Blue Shield of Michigan (BCBSM) |
| **Date:** | January 18, 2016 |

## Executive Summary

This brief section highlights the purpose for and value of the use case. The executive summary gives a brief description of the use case's importance while highlighting expected positive impact.

One of the most important goals of sharing patient information electronically is helping doctors build complete, current pictures of their patients using health information from multiple sources. These sources can include other doctors or specialists, hospitals, clinics, pharmacies, skilled nursing facilities and any other healthcare setting where care is provided. Enabling doctors to gather the details to build these complete patient pictures requires accurate "patient-matching" to make sure electronic health information from outside sources is attached to the correct patient.

These patient-matching challenges can cause higher healthcare costs and lower care quality in many ways. When a patient's health information is shared among doctors who use different systems, a lot of effort is needed to find and evaluate variations and identify the correct patient in each health information system. Errors can and do occur, meaning the wrong information can be matched to a patient.

**Purpose of Use Case:** The Common Key Service (CKS) use case provides a consistent and reliable way to match patients with their electronic health information across multiple organizations, applications, and services.

# Overview

This overview goes into more details about the use case.

Patient-matching is very difficult due to the many ways patient information is stored in different computer systems and networks. For example, one hospital registration/ admission system may show gender as "Male," "Female," and "Unknown," while a primary care doctor's office system may simply list "M," "F," and "U." And while this simple difference can be quickly understood, the problem can be much more complex. A patient's name may be entered as Maryann Anthony at the hospital, Marianne Anthony in her primary care physician's system, and Mary Anthony in her specialist's system.

To make the issue more confusing, Maryann's address in one system may be her most recent, while another system still lists the address of her previous home. There may be another "Maryann Anthony" with the same birth date living in the same city or county. And newborn infants that aren't named immediately may be entered into the birthing hospital's system as simply "Baby Girl Anthony." In a case like that, if there is a twin, Maryann's lab results could be added to her twin sister Merry's medical record instead of to hers.

To clarify exactly how common this problem is, in Harris County, Texas in 2012, there were 2,488 real patients named Maria Garcia, 231 of which had the same birth date. In fact, in just that county alone, there were 69,807 pairs of patients who shared both names and birth date.[1]

The implications of an incorrect treatment as a result of these errors could cause serious adverse downstream effects for patients. Failures of care coordination cost $35 billion[2] in annual healthcare waste and can cause complications, hospital readmissions, declines in functional status, and increased dependency (especially for the chronically ill for whom care coordination is essential). Average annual costs to correct mismatching errors range from $500,000 to well over $1 million on human resources alone.[3]

To streamline the exchange of health information, electronic healthcare systems require reliable patient-matching tools to ensure that the right information is attributed to the right patient every time. The Common Key Service (CKS) use case utilizes multiple methods to link health information to individuals, such as:

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[1] Susan D. Hall, "Which Maria Garcia? Bipartisan center seeks to improve patient data matching," *Fierce Healthcare* (June 27, 2012), accessed on July 28, 2016, http://www.fiercehealthcare.com/it/which-maria-garcia-bipartisan-center-seeks-to-improve-patient-data-matching

[2] "Eliminating Waste in US Health Care," *JAMA* 307, no. 14 (April 11, 2012).

[3] "Challenges and Strategies for Accurately Matching Patients to Their Health Data," (Bipartisan Policy Center, June 2012), http://bipartisanpolicy.org/wp-content/uploads/sites/default/files/BPC HIT Issue Brief on Patient Matching.pdf.

1. The CKS uses proven matching criteria to ensure that patient details (such as last name, date of birth, and phone number) positively and accurately identify the patient.
2. The CKS connects with a master person index (MPI) to manage information about patients and to eliminate duplicate entries with great accuracy.
3. This MPI uses an industry best-practice formula to determine that Maryann Anthony, Marianne Anthony, and Mary Anthony are in fact the same person based on her other details (such as last name, date of birth, and last four digits of her Social Security Number).
4. The CKS assigns a unique key that is stored and attached to the patient in the MPI and shared with all systems exchanging information about that patient. Each system can link their respective medical record number to the same common key and then include the common key when exchanging information about the patient.

Essentially, the CKS strengthens matching by providing a consistent and accurate detail (the individual patient's common key) that each system can rely on.

This reliable matching capability improves patient safety and data integrity in all use cases when information is shared about a specific patient. Over time, as CKS adoption grows throughout the state and more and more local systems link patients to a common key, it may no longer be necessary to include all of a patient's demographic information when exchanging their medical information. This would further improve the privacy and security of the information exchange as well by de-identifying the message.

## Persona Scenario

To explain this use case, this section follows a persona example from start to finish.

Tricia Franklin, a 29-year-old soon-to-be mother, is ready to give birth to her first child and is preparing to be admitted to a small hospital in Southern Michigan. In the months leading up to the birth, Tricia has been looking for a place to live permanently and ended up bouncing between different doctors in the Upper Peninsula and Southern Michigan to meet her prenatal, behavioral health, and primary care needs. Previously, when Tricia filled out paperwork with new doctors, she used the addresses of different friends she was staying with at a given time. Sometimes Tricia also filled out paperwork with other variations of her name: Trish and Patricia.

While Tricia's doctors are spread out in several different geographic locations, every member of her care team is committed to active involvement in Tricia's healthcare. Each doctor has declared an active care relationship with Tricia in the Active Care Relationship Service (ACRS) and has requested to receive alerts and notifications relating to her care when her status changes.

When Tricia is admitted to Community Family Hospital, an electronic notification is sent to her active care team members. In the past, even the minor differences in a patient identifying information in each of the medical records could lead to failure in finding some of records, which could then lead to incomplete coordination of care. However, because Tricia has been assigned a unique "common key" and each member of her care team has linked Tricia to the same common key in their system(s), all of the care team members will receive the notification that she has been admitted. Each member of the team can easily find their records for her with knowledge that they have identified the correct patient and provided the complete records for her.

Tricia's care team now feels confident that they can better coordinate and stay informed on her care now that they use a common key to help increase the ability to locate the correct health information.

Medical records should not be the first thought on any new parent's mind. And now being part of the CKS, Tricia isn't distracted by it. She gets to focus all her attention on her new bundle of joy.

# Diagram

This diagram shows the information flow for this use case.

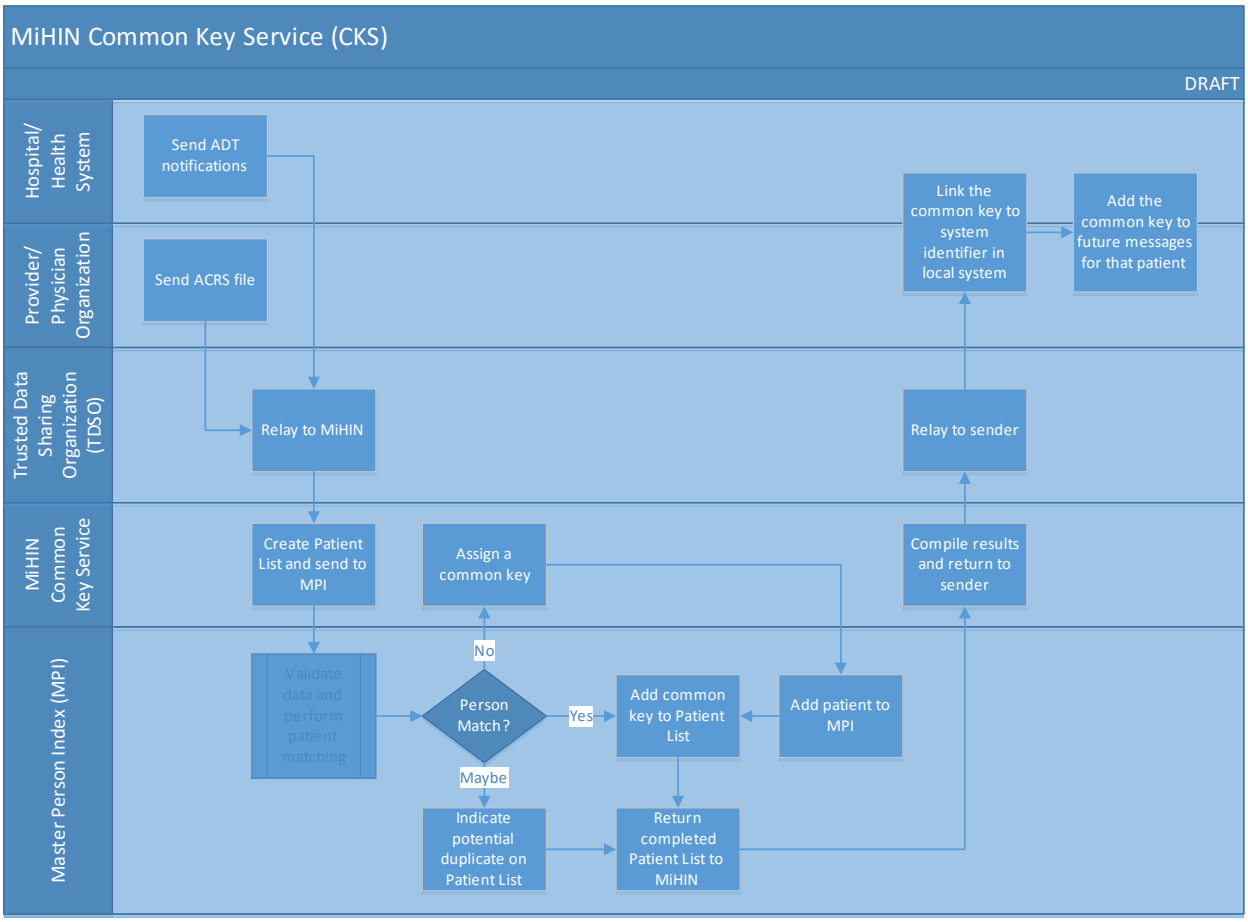


***Figure 1. Common Key Service***

# Regulation

This section describes whether this use case is being developed in response to a federal regulation, state legislation or state level administrative rule or directive.

**Legislation/Administrative Rule/Directive:**

☐ Yes
☒ No
☐ Unknown

Public Law 111-152 (Affordable Care Act)
Public Law 111-5; Section 4104 (Meaningful Use)

**Meaningful Use:**
☐ Yes
☒ No
☐ Unknown

The Common Key Service is not a Meaningful Use requirement; however, CKS supports the ability of EPs/EHs to meet Meaningful Use requirements.

## Cost and Revenue

This section provides an estimate of the investment of time and money needed or currently secured for this use case.

The primary factors in evaluating the return on investment to implement the CKS will be the time savings and increased efficiency derived from a statewide CKS.

This use case creates tremendous cost savings for virtually all health information technology and health information exchange systems within the State of Michigan by enabling all of these systems to be mapped to a statewide MPI via the CKS. For example, any major health system must interact with multiple systems, each having their own unique medical record numbers, which are not easily mapped one to the other for the same person or patient. The CKS eliminates these inefficiencies by enabling uniform patient mapping across organizations, which is also mapped to the MPI.

The average rate of patient-matching error is 8% and can range up to 20% in any given health system.[4] These errors can be very costly not only to a patient's health but to a health system's budget. According to Joey Sudomir, Senior Vice President and CIO of Texas Health Partners, it costs about $600-$800 to remediate duplicate patient identities following hospital discharge. Sharp Healthcare in San Diego has ten full-time employees just to investigate and clean up duplicate records. This costs the center $1 million a year.[5]

An effective patient-matching solution can prevent these errors and save health systems the millions of dollars it takes to correct those errors each year.

[4] "Identity crisis: an examination of the costs and benefits of a unique patient identifier for the U.S. health care system," *RAND Corporation* (2008) and "Summary of CHIME survey on patient data-matching." *College of Healthcare Information Management Executives* (Washington D.C.: Presentation, Bipartisan Policy Center Collaborative on Health IT and Delivery System Reform, May 16, 2012).

[5] Neil Versel, "CIOs push for patient ID progress," *Healthcare IT News* (October 15, 2013), accessed on July 25, 2016, http://www.healthcareitnews.com/news/cios-push-patient-id-progress

Of even greater value are the improvements to statewide patient safety and care coordination that precise and automated patient identification will enable. For example, the CKS will ensure that medication and allergy information is tied to the correct person through the continuum of care, enhancing patient safety and potentially reducing the risk of medical errors.

## Implementation Challenges

This section describes the challenges that may be faced to implement this use case.

One challenge will be the rate of adoption of the CKS within health information exchanges, health systems, physician organizations, health plans, other health care organizations, and the vendors for all of these organizations.

Another challenge will be coordinating data stewardship statewide. Governance will be put in place to coordinate data cleansing activities, including links, splits, merges, and overlays. An overview of these activities and their implications is summarized in the table below:

| Action | Definition | **Statewide CKS Implications** ***(Across health systems, managed by MiHIN)*** | **Local MRN Implications** ***(Within single health system, managed locally)*** |
|---|---|---|---|
| Link | Patients from two sources are determined to be the same person | Patient is a "match" and assigned a single key; linked to MPI | Not impacted by statewide linkages or linkage splits |
| Merge | Two identifiers have been assigned to the same patient | Retire both keys; assign new key; retain audit log; broadcast change on error report | Notify MiHIN if a common key has been assigned to either identifier |
| Split | One identifier has been assigned to two patients | Retire key; assign two new keys; retain audit log; broadcast changes or error report | Notify MiHIN if a common key has been assigned to identifier |
| Overlay | Patient record overwritten in error (such as wrong patient selected at admission) | Not applicable statewide | Requires immediate correction when known; will likely be corrected before discharge message is sent |

A successful integrated approach must also consider:

- New interfaces
- Data cleanup
- Cost
- Engagement
- Defining value to decision makers
- Ongoing maintenance
- Non-U.S. citizens and those without SSNs
- Workload
- Matching like-data
- Building confidence in the matching level
- Data standards

- System limitations
- Turnaround time of query results

## Vendor Community Preparedness

This section addresses the vendor community preparedness to readily participate in the implementation of this use case.

The vendor community will adopt this use case as a result of the strong desire of health organizations to implement the new efficiencies and reduced workflows that CKS affords, as well as the improved outcomes that will result from much better mapping and matching of patients.

This use case will utilize current technical capabilities of vendor products with modern architectures, such as the ability to utilize web services. This use case will also require new functionality at the vendor level where the vendor has a legacy architecture that does not utilize web services or application programming interfaces.

Vendors with the ability to use web services can adapt their products to leverage the CKS very quickly. Vendors without this ability could take significantly longer (or possibly never) to make the transition.

## Support Information

This section provides known information on this support for this use case.

Support can come from multiple levels (Governor, Federal or State Legislature, Michigan HIT Commission, Michigan State Departments, CMS/ONC/CDC, MiHIN Board, Participating Organizations, payer community, interest groups [e.g. MSMS, MHA], or citizen support).

**Political Support:**

☐ Governor
☐ Michigan Legislature
☒ Health Information Technology Commission
☒ Michigan Department of Health and Human Services or other State of Michigan department
☐ CMS/ONC
☐ CDC
☒ MiHIN Board

***Other:*** Patient matching is a nationwide challenge faced by virtually all health organizations, many of which support this use case and are eager to participate. Not only do they see the value in improving outcomes and reducing costs for their patients, but potential financial incentives from health plans may help offset the cost of implementation.

**Concerns/Oppositions:** It should be considered that vendors without the current capability to support a common key may initially oppose implementation of this use case. However, it is thought that the ultimate value proposition for accurate patient-matching is so high that most if not all impacted organizations will see the value in adapting to support better patient-matching efforts.

## Sponsor(s) of Use Case

This section lists the sponsor(s) of the use case.

Current sponsors are:
- MiHIN Shared Services (CKS development and launch)
- State of Michigan Department of Health and Human Service (MPI to CKS integration)
- Blue Cross Blue Shield of Michigan

Future potential sponsors include:
- Health systems
- Health plans
- Pharmaceuticals and others involved in research

## Metrics of Use Case

This section defines the target metrics identified to track the success of the use case.

The metrics used to measure the success of this use case include:
- Completion of successful integration and testing between the MPI and CKS starting with the Medicaid population
- Deploying the CKS with the first of each of the following types of organizations:
  - Trusted data-sharing organizations. For example, health information exchange-qualified organizations, sponsored sharing organizations, state-sponsored sharing organizations, consumer-qualified organizations, etc.
  - Health Systems
  - Health Plans
- Increasing the number of non-Medicaid patients in the MPI
- Deploying CKS with more HIEs, health systems, health plans, and other health organizations

# Other Information

This section is provided to give the sponsor(s) an opportunity to address any additional information with regard to this use case that may be pertinent to assessing its potential impact.

Critical success factors to a successful integrated approach include:

- Conservative approach
- Clean MPI
- Clean data standards
- Cooperation
- System ability to store keys
- Leadership buy-in
- Stakeholder participation
- HIE involvement
- Inclusive approach
- Alignment between health system and payers
- EMR (electronic medical records) vendor representation
- National standard alignment