

Implementing an Enterprise Master Person Index (EMPI) at UCSF

Submitter’s information:

Victor Galvez, Integration Services Team Manager, UCSF Information Technology
Victor.Galvez@ucsf.edu 415-353-3809

Julia Wallace, Campus Integration Team Supervisor, UCSF Information Technology
Julia.Wallace@ucsf.edu 415-502-5788

Project Leader(s) and team members:

UCSF Health

David Dobbs, Executive Sponsor
Heidi Collins, Executive Sponsor
Catherine Weber, Project Manager (Patient Implementation)
Julia Wallace, Project Manager (Provider Implementation)
Jeff Love, EMPI Architect
Govardhan Giri, EMPI Administrator
Don Francis, Technology Director
Tim Hoffman, IT Security
Victor Galvez, Integration Manager
Tim Satterwhite, ETL Manager
Amit Shetty, Database Administrator
SheRee Garcia, HIMS Director
Fei Zhao, Epic HIMS and Reporting
Albert Ruiz, HIMS Analyst
Joyce Tanglao, Interface Programmer
Damon Ruhl, Interface Programmer
Rajesh Kamath, Interface Programmer
Veeraragavan Gopalakrishnan, Interface Programmer/API Developer
Mike Kilpatrick, Network Manager

Benioff Children’s Hospital Oakland (BCHO)

Devin Church, Interface Programmer
Kevin Racicot, Interface Programmer
Rebecca Perez, Report Writer
Margaret McNamara, Epic HIMS Manager
Mohua Mukherjee, HIMS Director

John Muir Health (JMH)

Mel Chung, Enterprise Data
Susan Carter, Technical Architect
Tina Landi, HIMS Director
David Hoffman, Business and Dev Portal
Mark Haney, API Programmer
David Greer, Extracts and Reports
Christine Haley, Extracts and Reports
Jeff Teixeira, IT Security
Christian Kernodle, IT Security
Shawn Chapler, Integration Manager
Joe Jung, Interface Programmer
Betty Wright, IT Network
Marty Tedlock, Network Manager

IMT Vendor

Corinne Blair, Project Manager
Jim Dafnis, Solutions Architect
Vincent Tran, Technical Consultant
Young Su Yoon, Technical Consultant
Ronald Connor, Technical Consultant

BayHealth

Pam Hudson, Interim CIO
Cathy Farmer, Technology Director
Daniel Afram, Data Analytics Director
Robert Buckel, Data Scientist

Summary

The near universal use of a certified Electronic Health Record (EHR) has led to higher quality and safer patient care by providing more accurate, up-to-date, and complete electronic information about a patient. It has also supported giving patients more seamless care across healthcare organizations because their medical records are electronic and shareable. All of this depends on being able to uniquely identify a patient so that all their information gets stored on the same medical record. However, because of inaccurate or changing patient

demographic information and different ways of identifying a patient across organizations, duplicate medical records for a patient can get created, each containing a subset of the patient’s complete medical information.

Duplicate patient medical records create patient safety risks, such as adverse medication interactions, because clinicians only have a partial picture of the patient’s diagnoses, procedures, test results, allergies and medications. Duplicate patient medical records also increase the cost of care because costly tests and other clinical activity must be repeated because they are not in the patient’s medical record. A recent study by Black Book Research found that the “average expense of repeated medical care because of duplicate records cost a reported average of \$1950 per patient per inpatient stay and over \$800 per ED visit.”¹

In order to address patient identity issues and support interoperability, UCSF Health (UCSF), in conjunction with Benioff Children’s Hospital of Oakland (BCHO) and John Muir Health (JMH), implemented an Enterprise Master Person Index (EMPI). The EMPI receives patient and provider information from multiple sources and uses probabilistic algorithms with thresholds to match and link this information into unique lists of patients and providers. The EMPI solves patient and provider identity issues not only within UCSF’s EHR but also improves sharing of patient medical records across multiple organizations as each person is assigned a unique cross-organization identifier.

Solution

The tool selected for the EMPI implementation is the IBM® InfoSphere Master Data Management (MDM) v11.5. The project goal was to build a centralized master patient/provider index for UCSF Health, John Muir Health (JMH), and UCSF Benioff Children’s Hospital Oakland (BCHO).

UCSF IT, in partnership with BCHO and JMH, implemented the patient component of the EMPI (EMPI Patient) for the 6 million patients that have been seen at UCSF, BCHO and JMH. The EMPI creates a master index of patients and provides a number of benefits, including understanding where a patient has received medical care, sharing a patient’s health record across organizations, and improving patient referral processes and patient safety. The IBM MDM engine receives data from multiple systems and then analyzes the records to locate ones that have a high probability of match. The matching records are linked into entities, which may point to multiple records across systems. If there is a question about the match, a review task is added to the work queue for a Medical Records Department User. Ownership of data (updates and merges) remains at the source level EHR. The EMPI for Patients was completed in March 2017 with a go-live for Providers slated for May 2018.

EMPI Patient goals:

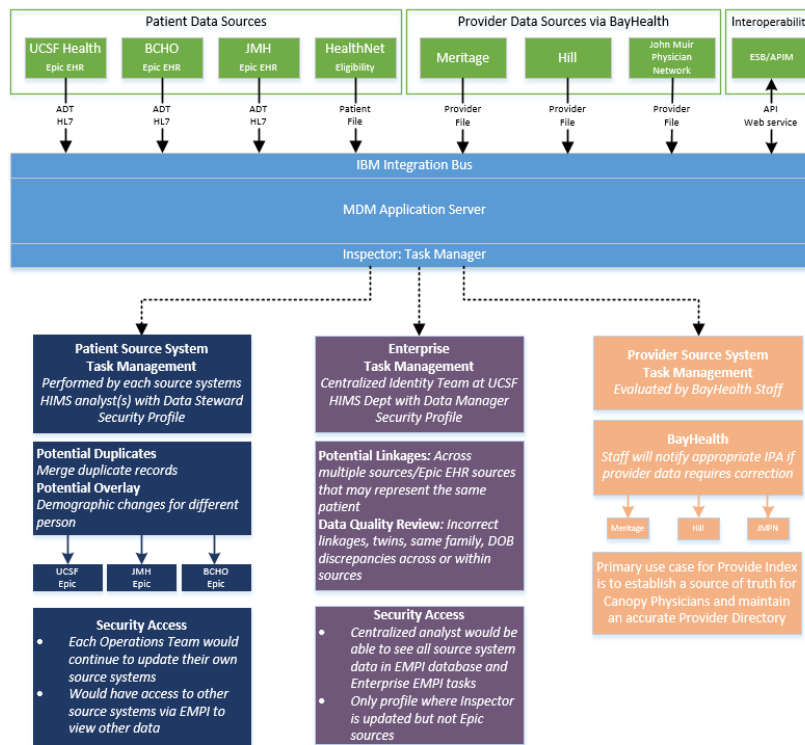
- Establish a source of truth patient database populated with data sent from each health system’s Electronic Health Record (EHR) source system. The patient index will have an enterprise ID assigned that contains the Medical Record Numbers (MRNs) specific to each facility that the patient has visited.

¹ Improving Provider Interoperability Congruently Increasing Patient Record Error Rates, Black Book Survey, <https://www.prnewswire.com/news-releases/improving-provider-interoperability-congruently-increasing-patient-record-error-rates-black-book-survey-300626596.html>

- Improve patient safety by reducing duplicate patient medical records containing only partial patient medical record information.
- Support sharing of patients’ medical records across organization.
- Support UCSF Health’s current and future affiliations and partnerships.

EMPI Provider goals:

- Establish provider database to be used as a source of truth populated with data from each Independent Physician Association (IPA) associated with Canopy. The provider index will have an enterprise ID assigned that contains the source ID numbers specific to each IPA that a provider belongs to.
- Provide view of Primary Care Physician (PCP) relationships with patients.



The EMPI was able to support the sharing of medical information across the 3 health systems by identifying and linking over 350,000 patient records across sites. The EMPI was also able to find and flag nearly 60,000 patients that had duplicate medical records within a health system. This both reduces patient safety risks and has the potential to save millions of dollars by not having to repeat costly tests and clinical activity. Since the patient EMPI was implemented the duplicate errors across all the organizations has significantly been reduced.

	March 2017 (go-live)	April 2017	May 2017	May 2018 (this month)
UCSF Duplicates	45,436	43,344	30,400	4
JMH Duplicates	9,562	6,372	2,899	2,972*
BCHO Duplicates	4,704	2,893	6	5

*JMH increase due to recent implementation of Community Connect

In addition to the successful implementation of EMPI Patient, the EMPI was leveraged for interoperability projects at UCSF by using a re-usable EMPI API for patient matching. Completed projects includes:

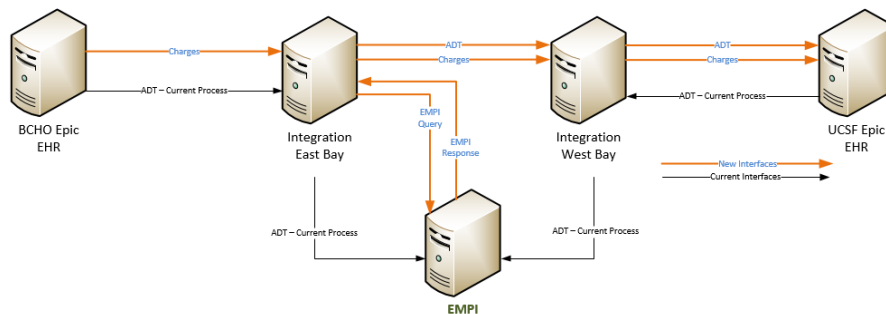
- Submission of professional charges for UCSF clinicians providing services at UCSF Benioff Children’s Hospital Oakland (BCHO). This eliminates an ongoing 4 FTEs worth of effort and decreases the time it takes to bill and collect professional fees.
- Matching UCSF patients to deceased individuals on the California Death Registry. This provides important outcome information in the medical record and keeps UCSF faculty and staff from trying to contact and enroll deceased patients into studies and trials.
- Supporting the operational needs of the Berkeley Outpatient Clinic (BOPC) by linking UCSF and JMH patients into a Health Information Exchange (HIE) patient medical record repository.

UCSF IT is now preparing for a May 2018 go-live of the provider component of EMPI (EMPI Provider). This will resolve provider identity for a network of more than 5,000 doctors that form part of Canopy Health, an Accountable Care Network that is a joint venture between UCSF Health and John Muir Health.

Use of EMPI – Interoperability Case Studies

Pro-fee billing for UCSF clinical services provided at BCHO (BCHO Charges)

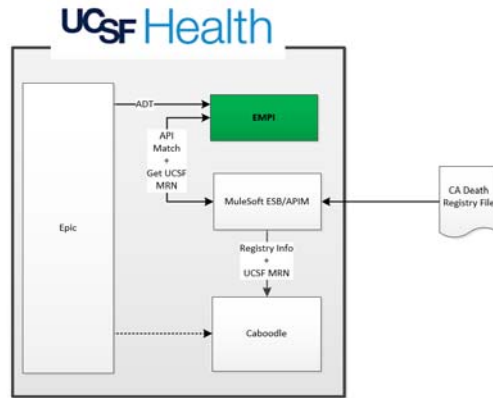
- Prior pro-fee billing process was completely manual:
 - Billers logged in to BCHO’s Electronic Health Record system and then manually replicated patient registration and encounter information in UCSF’s Electronic Health Record system.
 - 5 FTEs then manually posted the pro-fee charges in UCSF’s system.
- Automating the charge capture process has reduced 4 FTEs from process and has reduced the time to capture charges and the charge capture error rate.
- **A key component in the solution was use of the EMPI for patient identity so that charges could be matched to patients with better certainty.**



Identifying UCSF deceased patients from the California Death Registry

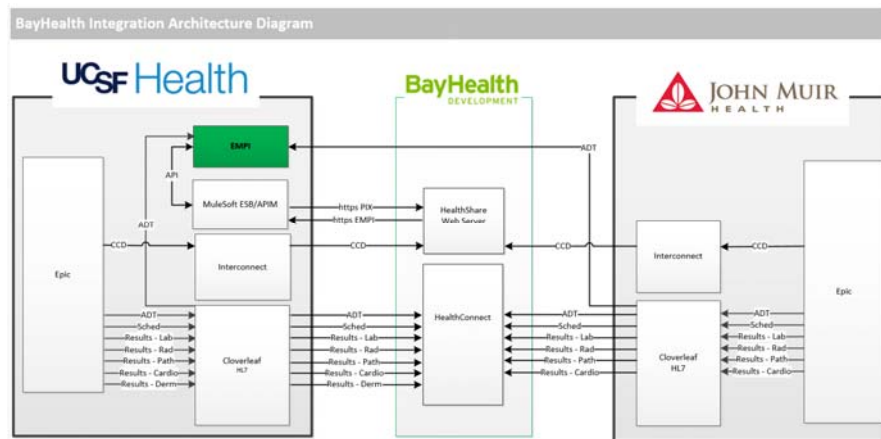
- Identify deceased UCSF Health patients from the California Death Registry file provided monthly to UC San Diego (UCSD) by California Department of Public Health.
- Leverages the EMPI to match patient identity and enriches the CA Death Registry data with the UCSF Medical Record Number (MRN).

- Information regarding the mortality² of UCSF patients is available to UCSF researchers.

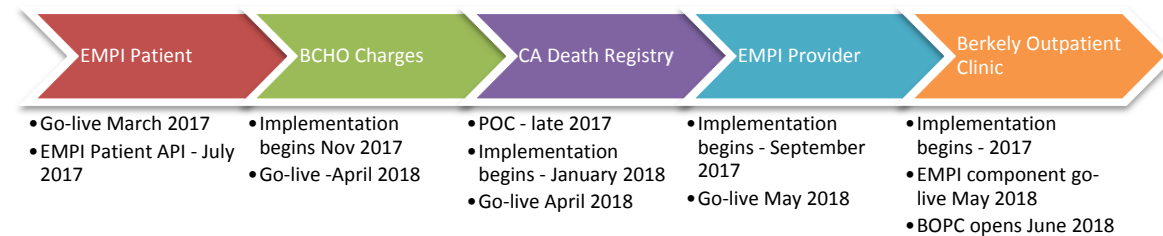


Supporting the operational needs of the Berkeley Outpatient Center (BOPC)

- Berkeley Outpatient Center is a JMH and UCSF joint medical center for primary care and specialty care.
- BOPC uses both John Muir Health’s EHR and UCSF’s EHR, the IT infrastructure at BOPC queries EMPI using UCSF or JMH MRN to get the enterprise id, and MRN at the other organization if the patient was seen at both the locations.
- In addition, an event notification interface was implemented from EMPI to the IT infrastructure at BOPC to keep the enterprise id in sync between the two systems if the enterprise id is updated in EMPI due to link, unlink, merge or unmerge events in EMPI.



Timeline



² The output of this project is not appended to the UCSF EHR.