Patient Unified Lookup System for Emergencies (PULSE)
System Requirements

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Submitted to: California Emergency Medical Services Authority
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The PULSE project was developed in collaboration with Office of the National Coordinator for Health Information Technology (ONC) staff to support nationwide health information exchange and care coordination efforts.
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1. Introduction

The California Emergency Medical Services Authority (EMSA) received a significant investment from the Office of the National Coordinator for Health Information Technology to support the integration of health information exchange with emergency medical services in California. This funding in part supports the development of a disaster response medical history portal called the Patient Unified Lookup System for Emergencies (PULSE) that is the subject of this document.

This document specifies the high-level system requirements that govern the development and implementation of PULSE. It also establishes security, initial capacity, and system architecture requirements.

1.1. System Overview

Natural or manmade disaster situations often force individuals to seek care outside of their usual facilities or provider networks. Additionally, the disaster area’s healthcare system is often stretched beyond its limits during a disaster, and volunteers must be placed into service to care for victims and evacuees. The result is that those delivering care may not have access to the primary systems holding the health information of the patients being received at their facility, leading to suboptimal outcomes and potential patient safety issues.

PULSE is intended to provide healthcare professionals with access to electronic health information for victims and evacuees during time of large-scale disaster – information that may be drawn from disparate systems within and outside of the affected region. Users of PULSE include disaster healthcare volunteers that will access health information through a web-based portal, and healthcare professionals that may use the capabilities of PULSE to search for and retrieve information from within the capabilities of their electronic health record systems or health information exchange systems. PULSE is not intended to be a replacement for an electronic health record, electronic patient care reporting system, or any other means for documenting care, but a supplement to existing electronic and paper-based systems designated for that purpose.

PULSE will be integrated with the existing California Disaster Healthcare Volunteers (DHV) database, California’s implementation of Emergency Service Advance Registry for Volunteer Healthcare Professionals (ESAR-VHP) that provides a registry for individuals who wish to volunteer to serve during an emergency or disaster. Healthcare professionals preregistered through DHV and activated for a disaster response will be able to access the PULSE portal, with DHV providing the means for authentication and authorization to access protected health information electronically.

PULSE will also be integrated with Directory Services, a component of the California Trusted Exchange Network (CTEN). Directory Services provides a services registry with the information PULSE requires to identify the healthcare organizations and facilities that participate in PULSE, and the means by which to search for and retrieve health information from them electronically.

There are five primary use cases envisioned for PULSE, which are retrieving health information to aid in caring for:
1. displaced patients evacuated from healthcare facilities in the disaster area for which a potential source of health records may be known
2. injured victims of the disaster transported by first responders for which little identifying information or prior healthcare history may be known
3. injured victims of the disaster transported by themselves, family, or neighbors for which more identifying information and healthcare history may be available
4. walking wounded victims and evacuees presenting to alternate care facilities with minor injuries requiring treatment
5. evacuees seeking primary care for chronic conditions or health issues unrelated to the disaster itself but unable to obtain it through their regular care providers or facilities

PULSE must support all of these potential use cases. It must be able to correctly match patient identities with varying amounts of input demographics or knowledge of organizations that have previously provided care, and be able retrieve health information suitable for the varying needs of the specific victim or evacuee.

See *Patient Unified Lookup System for Emergencies (PULSE)* for more information on the concepts for PULSE.

### 1.2. Scope

This document describes the system-level requirements for PULSE that are visible from outside the system and that may be necessary for:

- proper use by disaster healthcare volunteers
- proper interfacing to Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP), which in California is called Disaster Healthcare Volunteers (DHV)
- proper interfacing to Directory Services
- proper interfacing to participating healthcare systems and health information exchanges

This document does not include requirements for DHV or for Directory Services, save for specifying requirements for the interfaces between PULSE and those external systems.

This document does not describe the system architecture or other design aspects of PULSE, save any architectural constraints imposed as requirements. This document does not describe the software or hardware requirements for PULSE beyond those identified at the system level and visible from outside the system.

The intended audience for this document includes:

- the PULSE development contractor, as a starting point for PULSE development and system, software, and hardware requirements analysis
- the PULSE Operator that will operate PULSE during the grant period as an aid to implementation and a supplement to system, software, and hardware requirements analysis performed by the PULSE development contractor
1.3. Definitions, Acronyms, and Abbreviations

The following is a list of terms and their definitions as used in this document:

- administrator – A PULSE user with special access to perform configuration or other maintenance functions
- alternate care facility – A site designated on a temporary basis to address “surge capacity” when natural or manmade disasters cause casualties beyond the ability of the local healthcare systems to handle them by serving as triage stations, caring for the “walking wounded,” or providing patient care when local healthcare facility infrastructure is damaged
- California Data Use and Reciprocal Support Agreement or CalDURSA – A multiparty data sharing agreement and associated exchange policies designed to enable trusted exchange of protected health information statewide in California
- California Trusted Exchange Network or CTEN – A common set of policies, procedures, and lightweight technical infrastructure to create a trust environment for statewide health information exchange in California
- Directory Services – When capitalized, an external electronic services registry containing information necessary for PULSE to execute queries and retrieve health information
- Disaster Healthcare Volunteers or DHV – When capitalized, the California implementation of the Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) operated by the California Emergency Medical Services Authority
- disaster healthcare volunteer(s) – When not capitalized, a PULSE user authenticated through DHV and authorized to retrieve health information via PULSE’s web-based portal
- external health system – A health information system operated by a covered entity or its business associate participating in PULSE for the purpose of responding to queries for protected health information
- protected health information – Individually identifiable health information held or transmitted by a covered entity or its business associate, in any form or medium, whether electronic, on paper, or oral, as defined under US law
- user – Either an administrator or disaster healthcare volunteer

The following acronyms and abbreviations are used in this document:

- ACF – alternate care facility
- CalDURSA – California Data Use and Reciprocal Support Agreement
- CTEN – California Trusted Exchange Network
- DHV – Disaster Healthcare Volunteers
- EHR – electronic health record
- ESAR-VHP – Emergency System for Advance Registration of Volunteer Health Professionals
- HIE – health information exchange
• HIO – health information exchange organization
• PHI – protected health information
• PULSE – Patient Unified Lookup System for Emergencies
• SAML – Security Assertion Markup Language

The following terms have the specified meanings when capitalized and used in the statements of requirements in this document:

• SHALL and SHALL NOT indicate an absolute requirement that must be implemented, and its implementation verified. Must and must not are sometimes used as synonyms for shall and shall not, but are not used in this document.
• WILL and WILL NOT indicate a statement of fact or declaration of purpose, and are not subject to verification.
• SHOULD and SHOULD NOT indicate a goal which must be addressed by the design team but is not formally verified. For the most part, goals are not the subject of this document unless of such importance as to require that they be front-and-center to the design team during system design.
• MAY and MAY NOT indicate that an item is truly optional and allowed (or its exclusion allowed), and are used in this document only to clarify allowed optionality in a requirement.

1.4. Applicable Documents
The following documents are referenced within the requirements that follow:

• California Data Use and Reciprocal Support Agreement Version 1.0.2, approved 24 July 2014
• Carequality Connected Agreement (CAA), approved 5 November 2015
• Carequality Query-Based Document Exchange Implementation Guide Version 1.0, adopted 5 November 2015
• HL7 CDA Release 2, CCD. Implementation specifications: HITSP Summary Documents Using HL7 CCD Component HITSP/C32
• HL7 FHIR® Standard for Trial Use 3 (STU3), when released¹
• IHE IT Infrastructure Technical Framework Volume 2a (ITI TF-2a) Transactions Part A Revision 13.0, released 9 September 2016
• Nationwide Health Information Network Messaging Platform Specification Version 3.0, released 27 July 2011
• Nationwide Health Information Network (NHIN) Patient Discovery Web Service Interface Specification Version 2.0, released 27 July 2011

¹ The FHIR STU3 Candidate is in final ballot status at the time of the release of this document. It is the intent of this document that PULSE utilize FHIR STU3 once finalized.
- **Nationwide Health Information Network (NHIN) Query for Documents Web Service Interface Specification** Version 3.0, released on 27 July 2011
- **Nationwide Health Information Network (NHIN) Retrieve Documents Web Service Interface Specification** Version 3.0, released 27 July 2011

The following documents may be useful in understanding the purpose of PULSE and its intended use:

- *Health Information Exchange Services in Support of Disaster Preparedness and Emergency Medical Response*, prepared for the Office of the National Coordinator for Health IT Audacious Inquiry, published 21 April 2014
- *Patient Unified Lookup System for Emergencies (PULSE)*, prepared for the Office of the National Coordinator for Health IT Audacious Inquiry, published 15 March 2015

### 1.5. Revision History

Table 1  Revision history for this document.

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>10 February 2017</td>
<td>Draft for initial review</td>
</tr>
<tr>
<td>1.1</td>
<td>3 March 2017</td>
<td>Initial release following customer review</td>
</tr>
<tr>
<td></td>
<td>23 March 2017</td>
<td>Modified following initial user acceptance testing to add 6.7.3 and 6.10.1 as new requirements, delete requirement 6.8.2, and modify requirement 6.10 to allow addition of 6.10.1</td>
</tr>
<tr>
<td>1.2</td>
<td>14 July 2017</td>
<td>Modified to reflect requirements and design change to separate SAML requirements for DHV single sign-on from NwHIN specifications for authorization to access PHI, modifying requirement 4.2.1 and adding a new requirement 4.3.4.</td>
</tr>
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</table>
2. **System Requirements**

This section describes the functional and technical requirements for PULSE. Some requirements have been identified for PULSE, but at a lower priority and may not be implemented in the initial phase of development. Those requirements are so indicated.

2.1. **System Modes and States**

This section identifies the modes and states of PULSE.

1.1. The system SHALL support separate production and a test/demonstration modes.

1.1.1. The test/demonstration mode MAY be implemented as a separate instance of the system.

1.1.2. The production mode SHALL allow a user to search for and retrieve protected health information from external healthcare systems.

1.1.3. The test/demonstration mode SHALL NOT allow a user to search for or retrieve actual protected health information from external healthcare systems.

1.1.4. The test/demonstration mode WILL be used to test connections to participating health systems and health information exchanges test systems, conduct drills, and provide demonstrations.

1.1.5. If implemented as a separate instance of the system, the test/demonstration version SHALL integrate with test/demonstration versions of external systems to ensure that actual protected health information cannot be searched for or retrieved.

1.1.6. The test/demonstration mode SHALL allow a user to search for and retrieve fictitious health information for fictitious patients for testing and demonstration purposes.

Unless otherwise indicated, all subsequent requirements apply to both the production and test/demonstration modes of the system.

1.2. The system SHALL support separate “active” and “inactive” states.

1.3. The system SHALL allow an administrator to determine its current state as active or inactive.

1.4. The system SHALL allow an administrator to change its state from active to inactive and from inactive to active.

1.5. The system SHALL NOT allow a user to search for or retrieve health information when in the inactive state.

Unless otherwise indicated, all subsequent requirements apply to the system in its active state only.

2.2. **System Capabilities**

This section identifies required system capabilities in terms of availability, target deployment environment(s), device accessibility, and/or technical capability.
The following requirements apply to the system in both its active and inactive states.

2.1. The system SHALL be available on the Internet.

2.2. The system SHALL be available 24 hours a day and 365 days a year.

2.2.1. The operator of the system MAY define a specific service level for availability less than 100%.

The following requirements apply to the system in its active state only.

2.3. The system SHALL be accessible by disaster healthcare volunteers via a web browser.

2.3.1. The system SHALL support the web browser(s) included in a standardized bill-of-materials for computers deployed by emergency medical services for use by disaster healthcare volunteers during a disaster, if any.

2.3.2. The system SHOULD support the major browsers in common use.

The following requirements are identified at a lower priority and may not be implemented in the initial phase of development.

2.4. The query capabilities of the system SHALL be accessible by healthcare works through their electronic health records (EHRs) or health information exchanges (HIEs).

2.5. The query capabilities of the system SHALL be accessible by Carequality Connected Clients.

2.3. System Conditions and Constraints
This section identifies system assumptions and/or constraints that may limit the options available to the designer/developer.

3.1. Disaster healthcare volunteers WILL access the system only through the web browser.

3.2. Healthcare professionals that are not acting as a disaster healthcare volunteer and not located at an alternate care facility WILL access the system programmatically through their EHR or HIE.

3.2.1. Healthcare professionals that are not acting as a disaster healthcare volunteer and not located at an alternate care facility WILL be authenticated and authorized to access the system through their existing EHR or HIE.

3.3. Administrators MAY access administrative or configuration functions via authenticated access to the underlying server systems or configuration files.

2.4. System Interfaces
This section identifies system requirements for relationships or interactions with other systems, such as DHV, Directory Services, provider systems, or health information organizations (HIOs).
This section includes not only the implemented interfaces, but additional interface capabilities that are contemplated but at a lower priority. These interface capabilities are so indicated, and may not be implemented in the initial phase of development.

Figure 1 illustrates the interfaces to users and external systems references in this section.

![Diagram](https://via.placeholder.com/150)

**Figure 1** System-level diagram illustrating interfaces to users and external systems.

4.1. The system SHALL report its current active or inactive status (Report Status in Figure 1) to DHV via a programmatic interface.

4.1.1. The system MAY define a proprietary but open interface for reporting its active or inactive status.

4.2. DHV SHALL authenticate disaster healthcare volunteers to the system (Authenticate Volunteer in Figure 1) using SAML single sign-on.

4.2.1. The SAML assertion SHALL be compliant with *OASIS Security Assertion Markup Language (SAML)* Version 2.0.

4.3. The system SHALL query external health systems using eHealth Exchange specifications.

4.3.1. The system SHALL query for patient matches (Query for Patients in Figure 1) in a manner compliant with the *Nationwide Health Information Network (NHIN) Patient Discovery Web Service Interface Specification* Version 2.0.
4.3.2. The system SHALL query for existing documents for a matched patient, if any, (Query for Documents in Figure 1) in a manner compliant with the Nationwide Health Information Network (NHIN) Query for Documents Web Service Interface Specification Version 3.0.

4.3.3. The system SHALL retrieve existing documents for a matched patient, if any, (Retrieve Documents in Figure 1) in a manner compliant with the Nationwide Health Information Network (NHIN) Retrieve Documents Web Service Interface Specification Version 3.0.

4.3.4. The system SHALL create a SAML assertion in a manner compliant with the Nationwide Health Information Network Messaging Platform Specification Version 3.0 using necessary information obtained from the SAML assertion for single sign-on provided by DHV.

4.3.5. When querying for matching patients, querying for existing documents, and retrieving existing documents, the system SHALL also be compliant with the Nationwide Health Information Network Messaging Platform Specification Version 3.0 and the Nationwide Health Information Network (NHIN) Authorization Framework Specification Version 3.0.

4.4. The system SHALL query Directory Services (Query for Systems in Figure 1) using FHIR specifications.

4.4.1. The system SHALL retrieve the list of participating external health systems and the connection information required for matching patients, querying for existing documents, and retrieving existing documents using a RESTful FHIR STU3² programmatic interface.

The following requirements are identified at a lower priority and may not be implemented in the initial phase of development.

4.5. The system SHALL respond to incoming queries from an external EHR or HIE using eHealth Exchange specifications.

4.5.1. The system SHALL respond to incoming queries for patient matches (Query for Patients in Figure 1) in a manner compliant with the Nationwide Health Information Network (NHIN) Patient Discovery Web Service Interface Specification Version 2.0.

4.5.2. The system SHALL respond to incoming queries for existing documents for a matched patient, if any, (Query for Documents in Figure 1) in a manner compliant with the Nationwide Health Information Network (NHIN) Query for Documents Web Service Interface Specification Version 3.0.

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² See footnote 1 in Section 1.4 Applicable Documents.
4.5.3. The system SHALL provide retrieved existing documents for a matched patient, if any, (Retrieve Documents in Figure 1) in a manner compliant with the Nationwide Health Information Network (NHIN) Retrieve Documents Web Service Interface Specification Version 3.0.

4.5.4. When responding to queries for matching patients, queries for existing documents, and requests to retrieve existing documents, the system SHALL also be compliant with the Nationwide Health Information Network Messaging Platform Specification Version 3.0 and the Nationwide Health Information Network (NHIN) Authorization Framework Specification Version 3.0.

4.6. The system SHALL respond to incoming queries from an external EHR or HIE using Carequality specifications.

4.6.1. When responding to queries for matching patients, queries for existing documents, and requests to retrieve existing documents, the system SHALL be compliant with the Carequality Query-Based Document Exchange Implementation Guide Version 1.0.

2.5. **User Characteristics**

This section identifies each type of user by function, access environment, and the nature of their use of the system. In the future, as more information on the use of the system is gained, this section may also estimate the number of users in each group.

5.1. The system SHALL allow access to disaster healthcare volunteers.

5.1.1. Disaster healthcare volunteers WILL access the system only through the web browser.

5.1.2. Disaster healthcare volunteers WILL be authenticated to the system and authorized to access protected health information through DHV.

5.1.3. The system SHALL allow disaster healthcare volunteers to search for matching patients, query for available health information on matched patients, and retrieve existing health information on matched patients.

5.2. The system SHALL allow access to administrators.

5.2.1. Administrators MAY access administrative or configuration functions via authenticated access to the underlying server systems or configuration files.

5.2.2. The system SHALL allow administrators to control, monitor, and configure the system.

5.2.3. The system SHALL NOT allow non-administrators to control, monitor, or configure the system.

The following user characteristics are identified at a lower priority and may not be implemented in the initial phase of development.

5.3. The system SHALL allow access to healthcare professionals that are not acting as a disaster healthcare volunteer and not located at an alternate care facility.
5.3.1. Healthcare professionals that are not acting as a disaster healthcare volunteer and not located at an alternate care facility WILL access the system programmatically through their EHR or HIE.

5.3.2. Healthcare professionals that are not acting as a disaster healthcare volunteer and not located at an alternate care facility WILL be authenticated and authorized to access the system through their existing EHR or HIE.

5.3.3. The system SHALL allow healthcare professionals that are not acting as a disaster healthcare volunteer and not located at an alternate care facility to search for matching patients, query for available health information on matched patients, and retrieve existing health information on matched patients.

2.6. **Operational Scenarios**

Given the absence of a Concept of Operations, this section provides requirements that form a high-level description of how the system will be used.

The following requirements support the disaster healthcare volunteer and their access through a web browser or the administrator.

6.1. The system SHALL maintain a list of alternate care facilities (ACFs).

6.1.1. ACFs SHALL be identified by county name plus a two-digit number.

6.1.2. The administrator SHALL be able to configure the list of ACFs that can be selected by users.

6.1.3. Each ACF WILL be associated with a specific location identified by EMSA or its designee when a disaster is declared.

6.1.4. A user SHALL be able to add demographic information on the location of each ACF once a disaster is cleared and PULSE will be or has been activated.

6.2. The system SHALL require the disaster healthcare volunteer to select an ACF upon entering the system.

6.2.1. A disaster healthcare volunteer WILL be instructed on the ACF to which they are to report when activated to respond to a declared disaster.

6.3. The system SHALL obtain a list of participating external health systems from Directory Services.

6.4. The system SHALL obtain information about external health system interfaces from Directory Services sufficient to execute queries and retrieve health information.

6.4.1. The system MAY maintain a cached list of external health systems and their connection information.
6.4.2. The system SHALL refresh any saved information obtained from Directory Services from time to time to obtain any changes made to the list of external health systems or their connection information.

6.5. The system SHALL provide “search” and “review” modes.

6.6. A disaster healthcare volunteer SHALL be able to designate use of search mode or review mode, and be able to switch between modes.

The following requirements apply to the disaster healthcare volunteer using the system in search mode.

6.7. A disaster healthcare volunteer SHALL be able to search for patient matches for an individual by specifying key demographic information on the individual.

6.7.1. The system SHALL support all patient demographic information specified within the *Nationwide Health Information Network (NHIN) Patient Discovery Web Service Interface Specification* Version 2.0.

6.7.2. The system SHALL require only patient demographic information required by the *Nationwide Health Information Network (NHIN) Patient Discovery Web Service Interface Specification* Version 2.0.

6.7.3. The system SHALL require a day, month, and year for the patient date of birth rather than the greatest degree of detail as is available as specified in the *Nationwide Health Information Network (NHIN) Patient Discovery Web Service Interface Specification* Version 2.0.

6.7.4. The system SHOULD provide options for including demographic information in such a way as to support good workflow and not lead to user confusion.

6.8. The system SHALL query external health systems for matching patients using search parameters entered by a disaster healthcare volunteer.

6.8.1. The system SHALL provide feedback on the progress of each external health system in responding to a query for matching patients.

6.9. The system SHALL display a list patient matches and the demographic information returned by each external health system returning a match.

6.9.1. The system SHALL identity which external health systems returned matching patients.

6.9.2. The system SHALL identity which external health systems completed the query but did not return matching patients.

6.9.3. The system SHALL identity which external health systems failed to return a response to the query.
6.10. The system SHALL display a list of all active patient searches for the disaster healthcare volunteer that initiated the search.

6.10.1. The system SHALL NOT display patient searches initiated by other disaster healthcare volunteers.

6.11. The disaster healthcare volunteer SHALL be able to cancel any active search.

6.11.1. The disaster healthcare volunteer SHALL be able to cancel any active search for a specific external health system.

6.11.2. The disaster healthcare volunteer SHALL be able to cancel any active search for all external health systems.

6.12. The disaster healthcare volunteer SHALL be able to repeat any completed search.

6.12.1. The disaster healthcare volunteer SHALL be able to repeat any search attempted by a specific external health system, whether or not it completed successfully or was cancelled.

6.13. The disaster healthcare volunteer SHALL be able to delete any completed search.

6.14. The disaster healthcare volunteer SHALL be able to select among returned patient matches those that are to be associated with the specific patient of interest.

6.14.1. The disaster healthcare volunteer SHALL be required to identify the name, gender, and date-of-birth to display for the patient in review mode.

6.14.2. The system SHALL associate the patient with the ACF selected by the disaster healthcare volunteer when entering the system.

6.14.3. The system SHALL query the appropriate external health system(s) for existing documents automatically so they are available for retrieval.

6.14.4. The system SHALL remove the patient query and the results for all external health systems from the list of active patient searches after matching patients are selected.

The following requirements apply to the disaster healthcare volunteer using the system in review mode.

6.15. The system SHALL display a list of all patients with existing health information.

6.15.1. The patient SHALL be identified by the name, gender, and date-of-birth designated by a disaster healthcare volunteer in search mode.

6.15.2. The patient list SHALL include only those patients searched for within the ACF selected the disaster healthcare volunteer when entering the system.

6.16. The system SHALL display the number of existing documents containing health information for each patient in the patient list.
6.17. The disaster healthcare volunteer SHALL be able to view the metadata returned by the external health system for each existing document for each patient.

6.17.1. The system SHALL support all metadata returned as specified within the Nationwide Health Information Network (NHIN) Query for Documents Web Service Interface Specification Version 3.0.

6.17.2. The system SHOULD display only information to support good workflow and not lead to user confusion.

6.18. The disaster healthcare volunteer SHALL be able to request retrieval of any document associated with a patient.

6.18.1. The system SHALL provide feedback on the progress of each external health system in returning a requested document.

6.18.2. The system SHALL identify which external health systems returned documents successfully.

6.18.3. The system SHALL identify which external health systems failed to return the requested document.

6.19. The disaster healthcare volunteer SHALL be able to cancel any active request for a specific document.

6.20. The disaster healthcare volunteer SHALL be able to repeat a request for an existing document if cancelled or unsuccessful.

6.21. The disaster healthcare volunteer SHALL be able to view any retrieved document in the system.


6.21.2. The system SHOULD be able to display other common document formats returned by external health systems.

6.22. The disaster healthcare volunteer SHALL be able to print any retrieved document that can be displayed in the system.

6.23. The disaster healthcare volunteer SHALL be able to delete any patient and their health information from the system.

6.24. The system SHALL automatically delete a patient and their health information if not accessed within a configurable amount of time.
6.24.1. The administrator SHALL be able to configure the amount of time that a matched patient and their health information are retained without access by a disaster healthcare volunteer before being deleted.

6.24.2. The administrator SHALL be able to delete all matched patients and their health information.

The following requirements are identified at a lower priority and may not be implemented in the initial phase of development. They support the healthcare professional that is not acting as a disaster healthcare volunteer and not located at an alternate care facility accessing the system via an EHR or HIE.

6.25. A healthcare professional SHALL be able to search for patient matches via their EHR or HIE.

6.25.1. The system SHALL support searches for matching patients via queries conforming to the Nationwide Health Information Network (NHIN) Patient Discovery Web Service Interface Specification Version 2.0.

6.25.2. The system SHALL support searches for matching patients via queries conforming to the Carequality Query-Based Document Exchange Implementation Guide Version 1.0.

6.25.3. The system SHALL query all external health systems for the patient and return a consolidated result.

6.26. A healthcare professional SHALL be able to search for existing documents for discovered patient matches via their EHR or HIE.


6.26.3. The system SHALL query the external health systems with patient matches for documents and return a consolidated result.

6.27. A healthcare professional SHALL be able to retrieve discovered documents via their EHR or HIE.

6.27.1. The system SHALL support document requests conforming to the Nationwide Health Information Network (NHIN) Patient Discovery Web Service Interface Specification Version 2.0.

6.27.2. The system SHALL support document requests conforming to the Carequality Query-Based Document Exchange Implementation Guide Version 1.0.

6.27.3. The system SHALL request the document(s) from the external health system(s) in which they were discovered and return a consolidated result.
3. Policy and Regulation Requirements

This section specifies the relevant applicable laws, regulations, policies, and standards that will affect the operation and performance of PULSE, as well as any relevant external regulatory requirements, or constraints imposed by normal business practices. For example:

- multilingual support
- labor-related policies
- protection of personnel information
- reports to a regulatory agency

3.1. Policy Requirements

This section specifies requirements based on relevant organizational policies of EMSA or other organizations, or constraints imposed by normal business practices, that will affect the operation or performance of the system.

7.1. Disaster healthcare volunteers WILL be authenticated only via DHV.

7.2. Policies for accessing the system WILL be determined, configured, and enforced within DHV.

7.3. Disaster healthcare volunteers WILL be provided with notice within DHV of their responsibilities regarding access to protected health information retrieved by the system.

7.4. Disaster healthcare volunteers WILL be provided with notice within DHV of their responsibilities regarding protected health information printed by the system.

7.5. The system SHALL provide capabilities in such a way as to conform to policy requirements for the CTEN as identified in the California Data Use and Reciprocal Support Agreement.

7.6. The system SHALL provide capabilities in such a way as to conform to policy requirements Carequality Connected Agreement.

3.2. Regulation Requirements

This section specifies requirements based on any relevant external federal, state, or local regulations.

8.1. The system SHALL provide capabilities in such a way as to conform to all state and federal law.
4. **Security Requirements**

This section specifies the security and privacy requirements for the systems and its users.

9.1. The system SHALL provide access only to authenticated users.

9.2. The system SHALL encrypt all protected health information while at rest.

9.3. All protected health information SHALL be encrypted during transport.

9.3.1. All interfaces used by the system SHALL conform to *Transport Layer Security (TLS) Protocol Version 1.2* unless otherwise specified.

9.4. The system SHALL log information associated with all patient searches in an audit log.

9.4.1. The audit information SHALL include at least the date and time of the search, the disaster healthcare volunteer making the request, search parameters, the external health systems that were searched, which health systems completed a query, and which health systems reported a matching patient.

9.4.2. The audit information SHALL conform to audit log guidelines identified in the applicable profiles within the *IHE IT Infrastructure Technical Framework Volume 2a (ITI TF-2a) Transactions Part A Revision 13.0*.

9.5. The system SHALL log information associated with every request to retrieve health information in an audit log.

9.5.1. For queries for documents, the audit information SHALL include at least the date and time of the search for existing documents, the disaster healthcare volunteer imitating the search, the external health systems that were searched, which health systems responded to the query, which health systems reported that documents were available, and what documents they reported were available.

9.5.2. For requests for existing documents, the audit information SHALL include at least the date and time of each request for an existing document, the disaster healthcare volunteer imitating the request, the external health systems from which the document was requested, and whether the external health system responded with the document.

9.5.3. For all retrieved documents, the audit information SHALL include at least the date and time that a disaster healthcare volunteer viewed the document, if ever.

9.5.4. The audit information SHALL conform to the Audit Trail and Node Authentication (ATNA) profile in the *IHE IT Infrastructure Technical Framework Volume 2a (ITI TF-2a) Transactions Part A Revision 13.0*.

9.6. The administrator SHALL be able to extract information from the audit logs upon authorized request.
5. Initial Capacity Requirements

This section should provide an initial estimate of system capacity requirements, which might include anticipated number of concurrent users, estimated number of connected systems, and/or estimated number of transactions. Without any operational experience, it is difficult to estimate capacity requirements and they are not included at this time. They may appear in a future version of this document.
6. Architecture Requirements

This section identifies data platform, hardware, software, programming languages, tools, or operating system requirements, if any, for the application or project. This section is not intended to provide a system design, but only requirements that may constrain the architecture. For example:

- Any specialized hardware requirements that must be used in the system
- Any specialized software requirements that must be incorporated into the system
- Any programming languages or tools selected for the development or operation of the system
- Any network/operating system or combination of network/operating systems that will be used for the system

There are no system architecture requirements.