

## Implementation Plan for States & Jurisdictions

(Rev. – 3/30/18)

### I. Background

The purpose of this document is to provide a resource to states, cities, counties and other jurisdictions who wish to provide disaster health volunteers with secure access to an individual's health records in the event of a disaster.

Disasters are unpredictable and disruptive. They occur with little to no warning and place unique demands on public health, private sector healthcare, first responders and other key resources. Sadly, both natural and manmade disasters result in direct casualties and injuries caused by the event itself. But, the effects extend far beyond these victims. Often, the disaster displaces large numbers of people and can disrupt their ability to obtain their normal healthcare services. Healthcare facilities and ambulatory locations may be destroyed or damaged resulting in care being disrupted. Since more Americans suffer from complex chronic medical conditions that require regular treatment or medication, disruptions to this care will have dire negative consequences. The fragility of the US healthcare system to being disrupted by natural or man-made disasters has been well documented.

In response to this impact, the HHS Assistant Secretary for Preparedness and Response (ASPR) is responsible for helping public health and the private US healthcare sector prepare for and respond to all manner of natural and manmade disasters. ASPR, working closely with the CDC and state and territorial health officers, has developed an armamentarium of tools, templates and other resources to support effective preparedness and response by public and private healthcare resources in the US.

States and localities have developed robust disaster response plans which include using Volunteer Health Professionals (VHPs) to supplement healthcare providers who might be overtaxed or themselves be victims of the disaster. These same response plans often call for the use of Alternate Care Sites (ACS) in certain disasters in which field locations are established to treat individuals displaced by a disaster or when the existing healthcare sites are unavailable or overwhelmed. How and when these resources are used will vary widely across jurisdictions. However, timely access to accurate health information about those persons who are being treated at ACS is critical to be able to provide the highest quality of care.

Health information is maintained in multiple electronic health records across different healthcare organizations; and, VHPs are not, normally, authorized users for these organizations. This means that the wealth of health information that does exist is not available to those healthcare providers who need it at the point of care at ACS during and after a disaster. ASPR recognized this problem years ago and worked with the HHS Office of the National Coordinator for Health Information Technology (ONC) to find a way for health information exchange technology to be leveraged in support of treating persons affected by disasters. ASPR/ONC recommended in 2014 the development of a disaster response medical history portal called Patient Unified Lookup System for Emergencies (PULSE) to support treatment of persons affected by a disaster. In late 2014, ASPR and ONC began working with California to pilot the service. A prototype was successfully developed but never fully implemented.

During 2017, portions of California suffered devastating wildfires that required sudden evacuation of communities and the evacuation of two inpatient general acute care hospitals. This created an instant

demand for health information on those persons who were evacuated from their homes without their medications or essential medical equipment. Recognizing the potential value that PULSE could have in this disaster, the California Emergency Medical Services Authority (EMSA) worked closely with ASPR, the California Association of Health Information Exchanges (CAHIE), Audacious Inquiry and The Sequoia Project to make PULSE available to the affected communities. Working collaboratively, they were able to make PULSE operational, with access to most large health systems in CA, in record time during a very hectic holiday season. Fortunately, the worst-case scenario did not occur and PULSE was never actually deployed for use by the local Disaster Healthcare Volunteers. Even so, the California wildfires are a recent and vivid reminder that disasters are eminent and that every state and locality is vulnerable.

## **II. Value Case:**

PULSE addresses a unique need for timely and accurate health information about specific individuals who are disconnected from their regular healthcare support network due to a natural or man-made disaster. “All hazards planning” considers a wide range of possible disasters which could occur, even when the likelihood of any single event actually happening is low. It is well accepted that the US healthcare delivery system is important to almost any disaster response and recovery, which is why it is included as part of the nation’s critical infrastructure. It is well documented that the global healthcare system is vulnerable to disasters as well. Here is a small sample of events over the past 20 years that have disrupted the ability of the healthcare delivery system to function effectively during and after small and large disasters:

- Hurricanes Katrina, Rita and Tropical Storm Sandy-flooding of facilities, loss of power and destruction of medical records
- SARS outbreak in Toronto, Canada-massive staff shortages due to illness resulting in hospitals having to cease admissions and implement “work-quarantine” measures to remain open
- Numerous tornados resulting in destruction of hospitals and other healthcare facilities
- Wildfires resulting in rapid evacuation of hospitals in California
- Ebola outbreak in Africa resulting in widespread panic in US hospitals

Planning for the delivery of healthcare services in locations other than traditional healthcare facilities has been a staple of emergency and response planning for many years. Indeed, the idea of using pre-qualified medical professionals as a volunteer surge force is part of many state and local response plans. One major challenge, however, is how to provide emergency volunteers who are authorized to deliver the care with timely and accurate medical information about the persons being treated. Consider the following:

- persons who are hurriedly evacuated from their homes due to flooding or fires often do not remember the medications they take or the doses of those medications;
- elderly persons with cognitive impairments may not recall their medical conditions or drug allergies;

- evacuated persons who have been off their psychotropic medications for several days may exhibit symptoms of their underlying disease;
- the lack of a reliable medical history limits the ability to have observed signs and symptoms to be put into a proper clinical context.

The digitization of health records means that accurate information about almost everyone does exist on one or more electronic medical record systems. This information is not widely available for disaster response efforts, however, due to a variety of reasons (e.g. federal and state laws, data access policies, limited integration of disaster response with clinical care networks). This limits access to information that authorized volunteer health professionals need to appropriately treat individuals in emergencies. While healthcare volunteers, first responders and other paid medical personnel may be authorized to treat individuals in disasters, they may not be able to access information maintained in a patient's electronic medical record. The result is that healthcare providers will do their best to deliver appropriate care to persons affected by disasters with limited, or no, information about their patient's medical history, medications, allergies and other relevant information. Not only does this deprive the disaster victim of the best possible care, it might well bog down the effectiveness of alternate care sites and providers at the very time they need to be able to triage and treat patients quickly.

PULSE was developed to address this exact problem, by making health information available to qualified personnel who are responding to a disaster. PULSE links state and local emergency preparedness and response efforts to patient records maintained in the healthcare delivery system, so that health information about disaster victims is made available during and after a disaster in a safe and secure manner. PULSE leverages the interoperability of the nation's eHealth Exchange, which was incubated by ONC and then transitioned to operate in the private sector as a non-profit organization. This enables ACS to seamlessly communicate with health information exchanges (HIEs) and electronic health record systems, where patient information is maintained.

While there have been individual efforts to provide access to information in disasters, there has not been a uniform way to support such efforts, until PULSE. The purpose of this document is to help states and jurisdictions work through the decision-process to assess whether PULSE fits with the jurisdiction's particular needs. If there is a strategic fit, the document also outlines key decisions and roles and responsibilities for implementing and deploying PULSE.

### **III. Jurisdiction Self-Assessment Checklist**

Appendix A is a self-assessment checklist that can be used by states and jurisdictions to evaluate whether they have a demonstrable need for PULSE. The checklist also outlines key considerations for enabling successful implementation and use of PULSE.

First, it is recommended that states and jurisdictions assess the nature and likelihood of events which may warrant a service such as PULSE. Once need is established, a jurisdiction should evaluate:

- The current state of health record accessibility in the region, either available for a regional/state HIE or a national network.
- Whether there is active and engaged leadership to champion PULSE.

- If there will be sufficient buy-in to support PULSE.

Appendix A includes a Jurisdiction Self-Assessment Checklist that states and jurisdictions can use to their compatibility and need for PULSE.

#### **IV. Resource Management**

##### **Resources Needed to Implement PULSE**

- Each jurisdiction will have varying responsibilities for supporting the technical implementation of PULSE. Planning will be essential to assure appropriate people and financial resources are allocated to support the implementation and ongoing maintenance and use of PULSE to assure that the service remains in an appropriate state of readiness.

##### **Financial Considerations and Contracting**

###### Technical Costs:

- The cost to cover the technical implementation and operation PULSE will vary depending upon whether the jurisdiction wishes to manage and administer the system or if they wish to engage a 3<sup>rd</sup> party to do so. Determine the extent to which the jurisdiction can contract with a third party to implement and operate PULSE and which functions, if any, have to be managed by the jurisdiction.

###### Operating Costs:

- Lessons learned from early experiences implementing PULSE, suggest allocating a significant portion of the funding (e.g. 50%) to on-the-ground preparations to use PULSE, including:
  - Infrastructure – assuring there are laptops and Internet connectivity in the ACS
  - Communications and Outreach to raise awareness of PULSE and encourage volunteer health professionals to register in the state ESAR VHP system (if it is used to authenticate PULSE users)
  - User education and training – to assure users understand what PULSE is and how it is used prior to disasters, with refreshers available in disasters.

###### Funding:

- Determine how PULSE will be funded, including funding limitations or other considerations. For instance:
  - Who should be accountable for securing funding?
  - Are existing funding sources available? If not, what available alternatives are there? Is legislative action needed to make funding available?
  - Is it possible to obtain 90-10 matching funds via the state's Medicaid program and CMS? Can PULSE be supported through other programs that have already been funded? Assess whether PULSE costs can be reimbursed by FEMA or insurance, with proper documentation.

- Is it possible to have PULSE funded as part of the state's disaster response preparedness
- Assess whether there are limitations with contracting directly with non-profits?
- Are there expectations regarding the beneficiaries of the funding (e.g. local versus state)
- Are there price limits that the EMS agency can pay for services?

Contracting:

- Determine who is best suited to handle contracting for PULSE. Are joint sponsors needed?
- Would there be different contracts for implementation and ongoing support?

## V. Key Roles and Responsibilities

There are number of key roles and responsibilities to support a successful implementation, use and ongoing support for PULSE:

Role	Responsibilities
<b>Executive Sponsor</b>	The leader(s) who will embrace the value of health information exchange and champion the successful implementation of the PULSE system.
<b>PULSE Owner</b>	<ul style="list-style-type: none"> <li>• Determine who “owns” the PULSE program within the jurisdiction, including which agency(ies) have authority with respect to local and state emergencies.</li> <li>• Determine how to garner support for PULSE within the jurisdiction. Identify key leaders who need to be engaged and buy-in. Determine the decision process for obtaining approval to implement PULSE.</li> <li>• Identify the expectations for governance of the PULSE program, including the stakeholders who must be engaged, including the respective roles and responsibilities of the jurisdictional leadership and the PULSE operator.</li> </ul>
<b>PULSE Activation, Deployment, Deactivation Authority</b>	<ul style="list-style-type: none"> <li>• Identify decision process and decision-makers for PULSE activation, deployment and deactivation:</li> <li>• Who makes these decisions within your jurisdiction’s incident command structure?</li> <li>• Is there shared decision making between public health and emergency management? If so, how is this decision facilitated?</li> <li>• Can you identify a decision tree or metrics that will lead you to activate PULSE or will this have to be done on a case-by-case basis in response to individual facts and circumstances?</li> <li>• Identify the types of information that incident command will need form incident responders and mangers in order to recognize the need for PULSE in a given event and request that it be activated.</li> <li>• Identify who is responsible for communications throughout the incident / disaster, with clear lines of communication on matters related to PULSE</li> <li>• Establish clear communication protocols for standing up and standing down PULSE. What are the processes for the making decisions, and the actions that need to be taken to deploy PULSE and for deactivation? Is it well documented how decisions to “stand-down” emergency response following an event. How will you</li> </ul>

Role	Responsibilities
	<p>determine that the situation no longer requires use of the PULSE system? Is it tied to the use of alternate care locations or might PULSE continue be used even after these alternate care locations have stood down?</p>
<b>Program Lead</b>	<p>This individual or office is the day-to-day primary point of contact on PULSE implementation, maintenance and support who will:</p> <ul style="list-style-type: none"> <li>• Oversee and coordinate implementation of PULSE, in coordination with the technology provider and networks to which PULSE will connect.</li> <li>• Serve as the point of coordination within the jurisdiction, working with other agencies and offices.</li> <li>• Assuring the PULSE is properly integrated into the jurisdiction’s emergency response plans, with appropriate coordination with the authorities in charge.</li> <li>• Facilitating decisions which must be made on a host of policy matters, such as: authority to activate/deploy PULSE, etc.</li> <li>• Coordinate communications, outreach and training to other stakeholders, emergency response managers and responders to make them aware of PULSE and train on its use and maintenance</li> <li>• Since PULSE sits idle in a state of readiness, it will be important to periodically test PULSE. This role will oversee and plan the periodic table top drills, reviewing the results and informing ongoing readiness and integrating PULSE with statewide drills as applicable. Determine frequency and related scenarios, roles and responsibilities, with the aim of getting disaster health volunteers involved.</li> </ul>
<b>Policy &amp; Requirements Definition</b>	<p>If implemented at state-level:</p> <ul style="list-style-type: none"> <li>- Decisions are likely made by the agency sponsoring PULSE, or in consultation with multiple agencies (e.g. public health, EMS, Medicaid)</li> </ul> <p>If implemented as a local assistance program:</p> <ul style="list-style-type: none"> <li>- Consider forming a Workgroup with representation of local stakeholders to vet the requirements, including policies, process and governance.</li> </ul>
<b>Regional, State, National Health Information</b>	<p>Define respective roles and responsibilities for governing PULSE, and identify points of contact for coordination:</p> <ul style="list-style-type: none"> <li>- Role of an HIE, to the extent that an HIE would facilitate the records requests via PULSE to other care providers</li> </ul>

Role	Responsibilities
<b>Exchange Connectivity</b>	<ul style="list-style-type: none"> <li>- Reliance on national networks to provide or augment connectivity to healthcare providers via PULSE</li> </ul>
<b>Jurisdictional Governance</b>	<p>Governance will vary depending upon a number of factors, such as: whether PULSE is implemented statewide or if implemented to address city, county or local needs. At a minimum, the jurisdiction has authority over use of PULSE, such as:</p> <ul style="list-style-type: none"> <li>- Governs policies and oversees operation of PULSE for jurisdiction events</li> <li>- Asserts authorization for volunteer workers and PULSE users</li> <li>- Defines and decides when to activate, deploy and deactivate PULSE</li> <li>- Integrates PULSE into the disaster response plans and processes</li> <li>- Coordinates with authorities and responders within the Jurisdiction and with the PULSE operator before, during and after events</li> </ul>
<b>Coordination</b>	<p>Identify necessary liaisons between those responsible for operating the PULSE system, Incident Command and other responders. These liaisons should have clear lines of communication with the PULSE operator real-time before, during and after an event.</p> <p>Define how PULSE deployment will be coordinated with EMS, hospitals, behavioral health resources, law enforcement, and temporary housing resources. An event of the size likely to trigger PULSE activation may affect the existing health care system in many ways. One must assume that the existing health care system may be operating at diminished capacity caused by physical damage, loss of utilities or staffing shortages.</p>
<b>Technical Implementation</b>	<p>Determine the role that the jurisdiction will have in the technical implementation of PULSE. For details, see Appendix B – Technical Implementation Process.</p>
<b>End User and Field Operations</b>	<p>Identify how VHPs will be provided with computers and Internet access to access PULSE. Will they bring their own laptops or will these be part of the fit-out of the alternate care facility?</p> <p>Develop field operations plan with input from applicable agencies / offices involved in emergency response.</p> <p>Develop user guide that addresses operational issues occurring with PULSE in the field for time-critical problem resolution.</p>



Role	Responsibilities
<p><b>Ongoing Support, Maintenance and Performance Improvement</b></p>	<p><b>Ongoing Support and Maintenance</b></p> <ul style="list-style-type: none"> <li>- Determine who has responsibility for the ongoing program support and maintenance for PULSE.</li> <li>- Define a change management process, in consultation with the governance and PULSE operator. Determine how change requests should be submitted, to whom and how they are prioritized and addressed.</li> <li>- Clarify roles and responsibilities of the jurisdiction and the PULSE operator.</li> </ul> <p><b>Periodic Testing and Drills</b></p> <p>Given the nature of PULSE, the system is expected to be idle for periods of time, until the system is activated and deployed for an event or disaster. It is very challenging to find licensed professionals who are available during the disaster to test PULSE. If unlicensed professionals are not authorized users of PULSE, it further limits the ability to test PULSE during a disaster. As a result, it will be imperative to do advance testing and drills to assure system readiness.</p> <p>It is critical that PULSE be tested periodically to have assurance of system readiness and availability. This can be accomplished through ongoing technical testing and table top drills.</p> <ul style="list-style-type: none"> <li>- <u>Test System Readiness and Availability</u>: Define process and frequency for ongoing testing to assure system readiness. This could include, quarterly or biannual end-to-end testing or periodic technical testing to verify system up-time and availability.</li> <li>- <u>Table Top Drills</u>: Develop and facilitate table top exercises, with end user engagement, to address:             <ul style="list-style-type: none"> <li>o Hypothetical scenarios</li> <li>o Scenarios in an environment with real patients</li> </ul> </li> </ul> <p>It will be important to assess whether the drills (which typically use fictitious data) will use a staging system or production system. In some instances, systems may not use fictitious data. If a staging system is used for the drill, it will be important to assess substantive differences from how PULSE would work in a production environment.</p>

Role	Responsibilities
	<p><b>Performance Improvement:</b></p> <ul style="list-style-type: none"> <li>- Determine who should be involved in periodic evaluations of PULSE to assess its performance and value in supporting disaster response efforts. To the extent possible, incorporate PULSE to existing performance evaluation processes to critique and improve disaster preparedness and response.</li> </ul>
<p><b>Communications and Information Management</b></p>	<p><b>Response Communications:</b></p> <p>Determine who is accountable for a communications plan that incorporates PULSE into disaster response plans and communications</p> <ul style="list-style-type: none"> <li>- Consider communications channels, protocols and approvals in coordination with other agencies, command center and Volunteer Health Professional Coordinators</li> <li>- Establish clearly understood communications during an event that links to Incident Command</li> <li>- Provide VHPs with necessary communication gear to support stable and secure communication. Plan for cell service to be unreliable.</li> <li>- Implement HIPAA compliant physical, administrative and technical safeguards to protect the privacy and security of patient information, including authorized access to PULSE.</li> </ul> <p><b>Awareness, Education and Outreach:</b></p> <ul style="list-style-type: none"> <li>- Develop communications package for PULSE</li> <li>- Build awareness of PULSE and its role in disaster response efforts, among leadership, disaster response stakeholders and the user community.</li> <li>- Encourage registration of volunteers to maximize those who have access to PULSE</li> </ul>
<p><b>Training</b></p>	<p><b>Prepare PULSE Training Materials</b></p> <ul style="list-style-type: none"> <li>- PULSE Users Guide and Rollout Kit</li> <li>- PULSE training toolkit for disaster health volunteers and administrators</li> </ul> <p><b>Train End Users, Volunteer Coordinators and Administrators</b></p> <ul style="list-style-type: none"> <li>- Deliver advanced and on-site training for local Volunteer Health Professional Coordinators and Volunteers on how to use PULSE</li> </ul>

Role	Responsibilities
	- Define process for PULSE technical support in coordination with the PULSE operator

## VI. Key Policy Considerations

There are a number of key policy considerations that will need to be made by the jurisdiction. For details, see below.

### 1. Identify the response scenarios where PULSE is intended to be used

- PULSE was originally designed to be used by Volunteer Health Professionals only where delivering care at an alternative care site (e.g. field hospital, evacuation center).
- Each jurisdiction will need to determine which scenarios PULSE is intended to be used and define appropriate terms regarding the activation, deployment and deactivation of PULSE. For instance: At what point is PULSE activated and available for use? When is PULSE actually deployed and in use by VHPs. When is PULSE deactivated?
- Factors to consider include:
  - Type of event: Is this event likely to result in large numbers of injuries that would require activation of alternate care facilities or result in large numbers of people being evacuated from their homes and current medical support network
  - Expected duration of the event: The longer an event lasts, the greater the impact on normal healthcare services and the ability of patients to access those services
  - Number of people affected and how they are affected: The issue here is the impact of the event on people. For instance, there might have large numbers of people effected, but not severely; and/or a smaller number of people affected dramatically.
  - Location (major metropolitan area v. isolated area): If the event impacts a major metro area then the number of people effected is, usually, higher. However, isolated areas often have much less resiliency in terms of healthcare resources so even a small number of people effected can create problems.
  - Magnitude of event: Assess whether the event is serious enough to require activation of alternate care locations. The essence of PULSE is to enable healthcare providers who are not part of the existing infrastructure to access information about patients and more effectively triage and treat them. Not every event, even large-scale events, will create a demand for this service. Assess the types of scenarios where PULSE would be of benefit.

### 2. Determine whether PULSE is intended to be used solely for treatment purposes

- PULSE was originally designed and used to treat individuals who were displaced due to a disaster and seeking care in an alternative care site.
- It is assumed that requests for records using PULSE are related to treatment of individuals affected by disasters.
- Assess whether PULSE is intended to only be used for treatment purposes.
- If it is contemplated for other uses (e.g. public health, non-health related emergency response), then changes to the PULSE system may be needed.

**3. Clarify that PULSE only provides the ability to find health records in the normal healthcare delivery system**

- PULSE was designed to request an electronic copy of health records from care providers in order to make timely decisions when treating individuals affected by events. PULSE is an historical medical health record lookup system and cannot be used for recording a patient encounter or treatment.

**4. Determine how long the searches and retrieved documents should be stored in PULSE while in use.**

**5. Determine Which Types of Health Volunteer Professionals are Authorized to Use PULSE**

- Define which VHPs are authorized users of PULSE. For instance:
  - Licensed volunteers – will there be an initial starter set of licensed professionals, with plans to expand? Or, are all licensed volunteers authorized to access PULSE?
  - Unlicensed volunteers – will unlicensed volunteers be provided access to use PULSE (e.g. to serve as registrars at the ACS locations)

**6. Define how user identities should be verified (authenticated) to assure that only authorized users can access to PULSE**

- Define how VHPs will be authenticated to PULSE
  - Identify the most appropriate data source for authenticating VHPs (e.g. ESAR VHIPs system)
  - Determine whether single sign on to PULSE (e.g. using the ESAR VHPs process) is required?

As an example: in California, the ESAR VHP system passed the assertion to PULSE, which identified the individual, role (i.e. authorized occupation) and purpose for the request.

**7. Determine Role Based Access for Users**

- For details, see Appendix C for Role-based Access Control options supported by PULSE.

**8. Determine how many patients have records available in the affected area**

- The jurisdiction should assess how many patients and records are accessible in a disaster area. This is an important metric to assess the value of PULSE during an event.
- Determine how patient record coverage information can be obtained.
  - For example, if there is a statewide HIE, the HIE may be able to provide this information. If there is not an HIE, are there other mechanisms to assess the availability of patient records for the affected population, such as working with a national network?
- Determine who will maintain or provide access to the patient record coverage information over time, as this will likely be used to assess whether PULSE would be beneficial to the response scenario.

## Appendix A: Self-Assessment Checklist for Implementing PULSE

Rev. 3/8/18

The following is a resource to help a state, county, city or other jurisdiction assess the strategic fit of PULSE, as well as the jurisdiction's readiness to implement and support PULSE.

### 1. Perceived Value of Patient Health Record Access in Disaster Response

- Would there be benefit in providing volunteer health professionals access to patient health records when treating individuals who are displaced by a disaster and seeking care in an alternative treatment facility?
- Is there value in having real-time access to this information electronically at the alternative treatment facility?
- Do you believe that PULSE would be embraced by the agency/ies responsible for disaster response?
- To what degree would a service such as PULSE be valued by your jurisdiction?

### 2. Characteristics of Disasters Which Create Demand for Patient Record Lookup

- What is the level of risk for disasters, either natural or man-made, that could have major impacts?
- What is the likelihood that a disaster would result in large numbers of injured or displaced individuals who require care in alternative treatment facilities?
- Is advanced planning a high priority due to recent experiences or seasonal or recurring emergencies?
- Is advanced planning a high priority for unexpected disasters or those with limited lead time for evacuations?

### 3. Leadership Champions Support Use Case and Clearly Agreed Upon "Owner"

- Does the jurisdiction have leaders who will serve as champions for the successful implementation of the PULSE system? For instance, are there strong, willing, motivated and savvy leadership in public health, Medicaid and Emergency management services who will work together and support PULSE?
- To what extent does the leadership embrace the value of health information exchange (e.g. EMS programs which get data for Medicaid programs or that share data with EDs or other data sharing initiatives)?
- Is there clear agreement on which agency / office should have accountability for the PULSE program?

- Would they champion PULSE and help articulate the value proposition of PULSE given the jurisdiction's threat assessment?

#### **4. Potential Overlap or Conflict with Existing Programs**

- Does the jurisdiction already use other programs or systems to facilitate access to patient health records for disaster response?
- If so, are these other programs perceived as filling the need that PULSE addresses? Is the perception accurate; and, if not, what can PULSE do that the jurisdiction's current programs or systems cannot?

#### **5. Resources Available**

- Can the jurisdiction financially support the PULSE Program? What funding mechanisms are available; and, who would be responsible for securing funding commitment?
- Are there other resources, such as staffing, to support the program?

#### **6. Jurisdiction Risk Tolerance**

- Is the jurisdiction willing to absorb the risk of implementing a new program? Every new program entails some level of risk. A jurisdiction will need to be prepared to deal with this should the implementation not go as planned.
- Is there prior experience with implementing new programs, with the resilience to weather expected challenges that any new IT program encounters? Is there well-established public health leadership who are willing to take on the risk?

#### **7. Jurisdiction Connectivity**

- How extensive are document-based queries implemented in the jurisdiction? For instance, is there a sufficient portion of the population covered so that patient information is likely accessible in the event of a disaster?
- To what extent are there Health Information Networks (such as HIEs) or other data sharing initiatives already supporting health records exchange (specifically queries for clinical documents) in the jurisdiction? What other types of data exchange exist within the jurisdiction; and, are these complementary or duplicative to PULSE?

## Appendix B: Technical Implementation Process

The following outlines a proposed process to support technical implementation of PULSE:

- 1) Understand
  - a. Work with stakeholders to obtain their requirements (capacity, legal requirements, IT systems integration, user database, permissions / security model, workflow, etc.)
- 2) Design
  - a. Design the deployment architecture to accommodate the identified requirements, which are largely anticipated to be configuration options.
- 3) Provision
  - a. Deploy the PULSE system hardware and software in data centers, partitioned for the agency, which could be supported by the PULSE operator.
- 4) (Optional) Customize
  - a. If needed, customize the PULSE system to accommodate agency-specific requirements such as custom integrations or legal requirements.
- 5) Configure
  - a. Configure required PULSE system parameters to implement the identified requirements (user data, geographic information, directories, local connections if needed, workflow, etc.).
- 6) Validate
  - a. Test proper operation of the system (verify compliance with agency-specific policy requirements, test performance, integrations, digital certificates, etc.).
- 7) Warm Standby State
  - a. Maintain the system in a warm standby status so that it's ready for activation and deployment as needed.
- 8) Activation State
  - a. Configure the system for anticipated deployment (alternate care facilities, connectivity, users, geography, etc.)
- 9) Deployed State
  - a. Production use for an approved field deployment.
- 10) Stand Down
  - a. Securely archive, scrub, and put system back into Warm Standby state.



## Appendix C: Role Based Access Control Options

For details regarding the user and group management functions and the roles defined for PULSE users, see: <https://github.com/pulse-us/portlet#user--group-management>