



TRACIE

HEALTHCARE EMERGENCY PREPAREDNESS
INFORMATION GATEWAY

Electronic Health Records
Topic Collection
1/4/2018

Topic Collection: Electronic Health Records

Patient data is as voluminous as it is vital. Recent disasters have highlighted the need for patient data to be accessible by emergency medical providers. Many healthcare facilities have switched to using electronic health records (EHR) to store patient health history and other data, but many still use paper tracking systems. There are several Health Information Technology/EHR programs available, making interoperability a challenge. Lessons learned from recent disasters highlight both the utility of these programs and the challenges associated with data collection, access, quality, and transfer capabilities. The resources in this Topic Collection include guidance and lessons learned specific to EHR.

Access the following ASPR TRACIE Topic Collections for additional, related information: [Communication System](#); [Cybersecurity](#); [Information Sharing](#); and [Virtual Medical Care](#).

Each resource in this Topic Collection is placed into one or more of the following categories (click on the category name to be taken directly to that set of resources). Resources marked with an asterisk (*) appear in more than one category.

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Must Reads

Abir, M., Mostashari, F., Atwal, P., and Lurie, N. (2012). [Electronic Health Records Critical in the Aftermath of Disasters](#). (Abstract only.) *Prehospital and Disaster Medicine*. 27(6): 620-2.

The authors discuss how electronic health records were used after Hurricane Katrina, in Haiti after the 2010 earthquake, and in Joplin MO, post-tornado.

Bresnick, J. (2013). [EHR Downtime: What to Do When an IT Disaster Strikes](#). *EHR Intelligence*.

In addition to emphasizing the importance of having a plan, the author shares tips for managing an outage under several categories: communication, patient intake and scheduling, and clinical documentation.

BridgeHead. (2012). [Whitepaper: Healthcare Disaster Recovery](#).

This white paper provides an overview of the digitalization of healthcare information. Understanding data backups and recovery times to safeguard electronic health records for facility health information systems will support planning and best practices to maintain continuity of patient care during a disaster disruption.

Cascella, L. (n.d.). [Weathering the Storm: Electronic Health Records and Disaster Recovery](#). (Accessed 1/4/2018.)

This article includes a list of considerations that planners can use as guidance when developing or improving information technology and electronic health records systems.

Genes, N., Chary, M., and Chason, K. (2013). [An Academic Medical Center's Response to Widespread Computer Failure](#).

The authors describe the disruption of the computer systems at Mount Sinai Medical Center in New York City on a single day, the hospital's response to the event, and subsequent modifications to emergency plans incorporating lessons learned. They found that departments that utilized a combination of electronic and paper systems were impacted less than the Emergency Department, which was completely reliant on electronic medical records.

Giannini, V. (2017). [The Role of Electronic Health Records when Disaster Comes](#). The University of Maryland Center for Health and Homeland Security.

The author summarizes recent history of the role of paper and electronic health records (EHR) and disaster, emphasizes the need for facilities to modernize record keeping (while addressing privacy concerns), and lists the benefits of EHR.

HITECH Answers. (2012). [Electronic Health Records – Lessons Learned from Sandy](#).

This article summarizes and provides links to resources related to the role played by electronic health records before, during, and after Hurricane Sandy. These resources are primarily articles authored by or interviews conducted with healthcare providers who shared their experiences.

Horahan, K., Morchel, H., Raheem, M., and Stevens, L. (2014). [Electronic Health Records Access During a Disaster](#). Online Journal of Public Health Informatics. 5(3): 232.

While the Long Beach Medical Center (New York) was rendered inoperable after Hurricane Sandy, their electronic health records (EHR) system remained functional. The authors share how the hospital's EHR system helped with continuity and record recovery.

Markle Foundation. (2006). [Lessons from KatrinaHealth](#).

This report describes how KatrinaHealth, an online service developed to help Hurricane Katrina survivors, worked with healthcare providers to grant them access to evacuees' records of medications (including dosages). The authors also share successes and challenges of the program and recommendations for the future.

Minghella, L. (2013). [Be Prepared: Lessons from an Extended Outage of a Hospital's EHR System](#).

The author shares her experience losing access to her facility's electronic health record system for ten days following a power outage.

Office of the National Coordinator for Health Information Technology. (2014). [Self Assessment Contingency Planning: General Instructions for the SAFER \(Safety Assurance Factors for Electronic Health Record Resilience\) Self Assessment Guides](#).

When electronic health records (EHR) are unavailable, this can have a negative effect on patient care and can lead to medication errors, images being unavailable, and the need to cancel procedures. The guidance in this document can help healthcare facilities establish contingency planning for planned or unplanned EHR outages.

Sebek, K., Jacobson, L., and Wang, J. (2014). [Assessing Capacity and Disease Burden in a Virtual Network of New York City Primary Care Providers Following Hurricane Sandy](#). Journal of Urban Health. 91(4): 615-622.

The Primary Care Information Project (PCIP) at the New York City Department of Health and Mental Hygiene worked with local clinicians to establish an electronic data system, and the authors reviewed PCIP-generated data sets to assess the impact of Hurricane Sandy. The authors discuss findings, including the strengths and challenges associated with using electronic health records in post-disaster settings.

Shin, P. and Jacobs, F. (2012). [An HIT Solution for Clinical Care and Disaster Planning: How One Health Center in Joplin, MO Survived a Tornado and Avoided a Health Information Disaster](#). Online Journal of Public Health Informatics. 4(1).

The authors explain how the use of electronic medical records (EMR) helped the healthcare community maintain operations after the Joplin tornado and emphasize the importance of incorporating EHR and information technology into emergency operations plans.

Upadhyay, D., Sittig, D., and Singh, H. (2014). [Ebola US Patient Zero: Lessons on Misdiagnosis and Effective Use of Electronic Health Records](#). *Diagnosis*. 1(4): 283.

The authors share their hypothesis regarding the treating physician's notes from the primary encounter with the first-ever travel-associated case of Ebola in U.S. history and highlight how language and symptom description were likely chosen from pre-scripted options in the electronic health record (EHR) system, contributing to a missed diagnosis. They explain the ripple effects of diagnostic errors made in EHRs and suggest related reforms in policy and practice.

U.S. Department of Health and Human Services. (2016). [Hospitals Largely Reported Addressing Requirements for EHR Contingency Plans](#). Office of the Inspector General.

This report details findings from a questionnaire sent to 400 hospitals that are reimbursed for using a certified electronic health records (EHR) system. Nearly all respondents reported having contingency plans for their EHR systems, but the authors emphasize the need for the Office of Civil Rights to implement a related, consistent audit program.

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2017). ASPR Electronic Medical Record (EMR) Data Share with FL Department of Health. (Contact fusion@hhs.gov for more information or to set up EMR data sharing capabilities.)

ASPR provided a de-identified data share of electronic medical record (EMR) data for patient encounters in the field to Florida Department of Health (FL DOH) from Disaster Medical Assistance Team (DMAT) teams deployed after Hurricane Matthew to provide medical support at Holmes Regional Medical Center in Melbourne, FL. ASPR was able to provide an automated EMR data share (updated every 15 minutes) directly to FL DOH's surveillance system ESSENCE-FL resulting in robust state/federal data sharing.

Guidance

Bookman, K. and Zane, R. (2013). [Expedited Electronic Entry: A New Way to Manage Mass-Casualty Radiology Order Workflow](#). (Abstract only.) *Prehospital Disaster Medicine*. 28(4): 391-392.

After a mass casualty incident (MCI), a task force was formed to review delays in radiology orders. They created a "browse page" that listed every type of x-ray and CT scan that might be needed in a similar event (and all required information was to "Disaster"). Tools like this can save time and hasten patient care in MCI and surge scenarios.

Bouri, N. and Ravi, S. (2014). [Going Mobile: How Mobile Personal Health Records Can Improve Health Care During Emergencies](#). *Journal of Medical Internet Research-mHealth*. 2(1):e8.

This article describes personal health records (PHRs) and their utility in disaster situations. It contrasts the instant availability of PHRs against the electronic medical record/health records that require 3rd party (provider) routing

Bresnick, J. (2013). [EHR Downtime: What to Do When an IT Disaster Strikes](#). EHR Intelligence.

In addition to emphasizing the importance of having a plan, the author shares tips for managing an outage under several categories: communication, patient intake and scheduling, and clinical documentation.

BridgeHead. (2012). [Whitepaper: Healthcare Disaster Recovery](#).

This white paper provides an overview of the digitalization of healthcare information. Understanding data backups and recovery times to safeguard electronic health records for facility health information systems will support planning and best practices to maintain continuity of patient care during a disaster disruption.

Demers, G., Kahn, C., and Johansson P. (2013). [Secure Scalable Disaster Electronic Medical Record and Tracking System](#). (Abstract only.) Prehospital and Disaster Medicine. 28(5): 498-501.

This article highlights the benefits of using an electronic medical record system to help manage mass casualty incidents.

HealthIT.gov. (2017). [Emergency Medical Services & Emergency Preparedness](#).

This webpage provides information and resources on emergency medical services (EMS) and emergency preparedness as it relates to health information technology.

Hoffman, S. and Podgurski, A. (2012). [Big Bad Data: Law, Public Health, and Biomedical Databases](#). (Abstract only.) Journal of Law, Medicine and Ethics. 41(s1):56-50.

The authors discuss the challenges associated with electronic health records (e.g., data entry error, interoperability and processing issues) and present suggestions for addressing these challenges.

Mansoori, B., Rosipko, B., Erhard, K., and Sunshine, J. (2014). [Design and Implementation of Disaster Recovery and Business Continuity Solution for Radiology PACS](#). Journal of Digital Imaging. 27(1):19-25.

The integration of Picture Archiving and Communication System (PACS) has improved access to patient image retrieval and storage. The authors emphasize the importance of having a robust disaster recovery plan in place to minimize PACS disruption; they list six primary issues for planners to consider integrating in their recovery designs.

RTI International. (2012). [Southeast Regional HIT-HIE Collaboration \(SERCH\): Final Report](#).

This report discusses health information exchange, state-specific legal barriers, and the benefits of using electronic health records and other data sources before a disaster strikes to promote more efficient response and recovery phases.

Sahi, A., Lai, D., and Li, Y. (2016). [Security and Privacy Preserving Approaches in the eHealth Clouds with Disaster Recovery Plan](#). (Abstract only.) *Computers in Biology and Medicine*. 1(78): 1-8.

With cloud computing being used to help store and handle large amounts of data, it is important to be aware of threats to security and privacy preservation. The authors review studies and propose and discuss two approaches to healthcare cloud data management: the Security-Preserving approach and the Privacy-Preserving approach.

Scheid, D., Yeaman, B., Nagykaladi, Z., and Mold, J. (2013). [Regional Health eDecisions: A Guide to Connecting Health Information Exchange in Primary Care](#). Agency for Healthcare Research and Quality.

While not disaster- or emergency-specific, this guide can help healthcare coalitions and healthcare providers and facilities learn more about the role of electronic health records systems in local health information exchanges.

The Office of the National Coordinator for Health Information Technology. (2017). [Section 4: Opioid Epidemic & Health IT](#). Health IT Playbook.

This section of the playbook explains how healthcare providers can use health information technology solutions (including electronic health records) to address the opioid epidemic. Links to other helpful tools and resources are also provided.

Lessons Learned: Earthquakes

Bambrick, A., Passman, D., Torman, R., et al. (2014). [Optimizing the Use of Chief Complaint & Diagnosis for Operational Decision Making: An EMR Case Study of the 2010 Haiti Earthquake](#). *PLoS Currents*.

After the 2010 Haiti earthquake, the U.S. Department of Health and Human Services used an Electronic Medical Record (EMR) system to support healthcare decision-making and report patient encounters. The authors share lessons learned, including the need to improve the EMR diagnosis categorization process since close to half of the records were missing medical data.

Levey, G., Blumberg, N., Kreiss, Y., et al. (2010). [Application of Information Technology Within a Field Hospital Deployment Following the January 2010 Haiti Earthquake Disaster](#). *Journal of the American Medical Informatics Association*. 17(6): 626-630.

This article explains how the Israel Defense Force Medical Corps set up a field hospital after the 2010 Haiti earthquake, complete with information technology that included electronic medical records (EMR). The authors share their positive experiences with the EMR and encourage the incorporation of similar systems in disaster response plans.

Lessons Learned: General

Abir, M., Mostashari, F., Atwal, P., and Lurie, N. (2012). [Electronic Health Records Critical in the Aftermath of Disasters](#). (Abstract only.) *Prehospital and Disaster Medicine*. 27(6): 620-2.

The authors discuss how electronic health records were used after Hurricane Katrina, in Haiti after the 2010 earthquake, and in Joplin MO, post-tornado.

Electronic Health Record Association. (2017). [Interoperability Success Stories: The Journey Continues](#).

These success stories—while not disaster-related—highlight the benefits of interoperability (which could bolster disaster response), such as improved care coordination, accelerated emergency discharges, more accurate documentation, and reduction in duplication.

Funt, D. (2017). [Interoperability During Disasters: Lessons from Tragedy](#). *Healthcare Analytics News*.

The author cites recent incidents (the shooting in Las Vegas, the fires in Northern California, and the hurricanes in Houston, Puerto Rico, and throughout the Southeast) and the critical role played by electronic health records in patient tracking, determining medical and medication history, patient identification and reunification.

Giannini, V. (2017). [The Role of Electronic Health Records when Disaster Comes](#). The University of Maryland Center for Health and Homeland Security.

The author summarizes recent history of the role of paper and electronic health records (EHR) and disaster, emphasizes the need for facilities to modernize record keeping (while addressing privacy concerns), and lists the benefits of EHR.

Goralnick, E., Halpern, P., Loo, S., and Gates, J. (2015). [Leadership During the Boston Marathon Bombings: A Qualitative After-Action Review](#). (Abstract only; supplementary materials available.) *Disaster Medicine and Public Health Preparedness*. 9(5): 489-495.

The project team analyzed qualitative data from focus groups and interviews conducted with physician leaders from seven hospitals who handled patients injured during the Boston Marathon bombings. Challenges with technology were discussed (along with other issues) as were plans for incorporating lessons learned.

Heisey-Grove, D., Chaput, D., and Daniel, J. (2015). [Hospital Reporting on Meaningful Use Public Health Measures in 2014](#). U.S. Department of Health and Human Services, Office of the National Coordinator for Health Information Technology.

The authors share how hospitals reported data (immunizations, emergency department visits, and infectious disease laboratory results) as it related to the Centers for Medicare and Medicaid Services' Electronic Health Record (EHR) Incentive Program. While not disaster-specific, the findings can be used to determine readiness and integration, and identify gaps in EHR planning.

Landman, A., Teich, J., Pruitt, P., et al. (2015). [The Boston Marathon Bombings Mass Casualty Incident: One Emergency Department's Information Systems Challenges and Opportunities](#). (Abstract only.) *Annals of Emergency Medicine*. 66(1): 51-59.

The authors share findings from post-incident briefing that included challenges with “unidentified patient naming convention, real-time situational awareness of patient location, and documentation of assessments, orders, and procedures.” To address these lessons learned, they updated select systems and clarified roles and responsibilities for maintaining electronic systems.

Simpson, C. and Novak, L. (2013). [Place Matters: The Problems and Possibilities of Spatial Data in Electronic Health Records](#). AMIA Annual Symposium Proceedings.

The authors discuss how linking electronic health record data could have helped healthcare providers identify at-risk patients after the Middle Tennessee Flood of 2010. They emphasize that geocoding patient addresses can be combined with other data to help produce “actionable alerts, reminders and other events for clinical decision support, care coordination and outreach.”

Teich, J., Wagner, M., Mackenzie, C., and Schafer, K. (2002). [The Informatics Response in Disaster, Terrorism, and War](#). *Journal of the American Medical Informatics Association*. 9(2):97-104.

The authors provide an overview on three threats (bioterrorism, mass-casualty events, and the delivery of optimal health care to remote military field sites), and the associated demand for collection, analysis, coordination, and dissemination of health data.

U.S. Department of Health and Human Services. (2016). [Hospitals Largely Reported Addressing Requirements for EHR Contingency Plans](#). Office of the Inspector General.

This report details findings from a questionnaire sent to 400 hospitals that are reimbursed for using a certified electronic health records (EHR) system. Nearly all respondents reported having contingency plans for their EHR systems, but the authors emphasize the need for the Office of Civil Rights to implement a related, consistent audit program.

Lessons Learned: Hurricanes

Brown, S., Fischetti, L., Graham, G., et al. (2007). [Use of Electronic Health Records in Disaster Response: The Experience of Department of Veterans Affairs after Hurricane Katrina](#). *American Journal of Public Health*. 97: S136–S141.

In this study, the authors explain how electronic health records helped the Department of Veterans Affairs maintain continuity of care for evacuated veterans after Hurricane Katrina.

DeSalvo, K. and Petrin, C. (2017). [From Katrina to Wildfires: Leveraging Technology in Disaster Response](#). Health Affairs Blog.

Healthcare planners can learn more about how incorporating electronic health records (EHR) and other lessons learned from recent disasters bolstered the medical responses to Hurricane Harvey and the California wildfires. The authors share lessons learned from Hurricane Katrina (particularly from the Veteran’s Administration, which used EHR at the time); describe the role of the Health Information Technology for Economic and Clinical Health Act; and share how tools such as EmPOWER serve vulnerable populations before, during, and after disasters.

HITECH Answers. (2012). [Electronic Health Records – Lessons Learned from Sandy](#).

This article summarizes and provides links to resources related to the role played by electronic health records before, during, and after Hurricane Sandy. These resources are primarily articles authored by or interviews conducted with healthcare providers who shared their experiences. (Note: link to audio is broken.)

Horahan, K., Morchel, H., Raheem, M., and Stevens, L. (2014). [Electronic Health Records Access During a Disaster](#). *Online Journal of Public Health Informatics*. 5(3): 232.

While the Long Beach Medical Center (New York) was rendered inoperable after Hurricane Sandy, their electronic health records (EHR) system remained functional. The authors share how the hospital’s EHR system helped with continuity and record recovery.

Markle Foundation. (2006). [Lessons from KatrinaHealth](#).

This report describes how KatrinaHealth, an online service developed to help Hurricane Katrina survivors, worked with healthcare providers to grant them access to evacuees’ records of medications (including dosages). The authors also share successes and challenges of the program and recommendations for the future.

Molteni, M. (2017). [Harvey Evacuees Leave their Belongings—and Health Records—Behind](#). *Wired*.

Lessons learned from Hurricanes Katrina and Sandy helped healthcare develop and implement electronic health records (EHR) systems, but because of several challenges, many patients find their records difficult to access after a disaster. The author explains these challenges and shares how the federal government's "Patient Unified Lookup System for Emergencies," or "PULSE" program is being pilot tested to help healthcare providers address these challenges.

Sebek, K., Jacobson, L., and Wang, J. (2014). [Assessing Capacity and Disease Burden in a Virtual Network of New York City Primary Care Providers Following Hurricane Sandy](#). *Journal of Urban Health*. 91(4): 615-622.

The Primary Care Information Project (PCIP) at the New York City Department of Health and Mental Hygiene worked with local clinicians to establish an electronic data system, and the authors reviewed PCIP-generated data sets to assess the impact of Hurricane Sandy. The authors discuss findings, including the strengths and challenges associated with using electronic health records in post-disaster settings.

Swann, J. (2017). [Electronic Health Records Blunt Hurricane Harvey's Impact](#). Bloomberg Law.

Because the majority of healthcare providers in the Houston area use electronic health records, patient evacuation and tracking and general health data management post-Hurricane Harvey continued relatively smoothly. The author shares how lessons learned from past incidents were incorporated into existing plans and programs.

Tahir, D. (2017). [Health IT Passes First Big Test with Hurricane Harvey](#). Politico.

Several hospitals contacted by the author reported that their electronic health records (EHR) systems remained connected throughout and after the storm. The author also discusses the past and future of EHR and the use of emPOWER to identify and communicate with patients who rely on electricity-dependent medical and assistive equipment.

* U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2017). ASPR Electronic Medical Record (EMR) Data Share with FL Department of Health. (Contact fusion@hhs.gov for more information or to set up EMR data sharing capabilities.)

ASPR provided a de-identified data share of electronic medical record (EMR) data for patient encounters in the field to Florida Department of Health (FL DOH) from Disaster Medical Assistance Team (DMAT) teams deployed after Hurricane Matthew to provide medical support at Holmes Regional Medical Center in Melbourne, FL. ASPR was able to provide an automated EMR data share (updated every 15 minutes) directly to FL DOH's surveillance system ESSENCE-FL resulting in robust state/federal data sharing.

Lessons Learned: Infectious Disease

Kurtzman, L. (2017). [UCSF Innovators Use EHRs to Track Hospital-Acquired Infection](#).

This article summarizes a study that used electronic health records (EHR) to track patient movement and the odds of C. diff infection resulting from exposure. EHR allowed the researchers to note patient locations outside of their hospital rooms (e.g., CT scanners in the emergency department) which contributed to the study's robust methodology and results.

Oza, S., Jazayeri, D., Teich, J., et al. (2017). [Development and Deployment of the OpenMRS-Ebola Electronic Health Record System for an Ebola Treatment Center in Sierra Leone](#). Journal of Medical Internet Research. 19(8): e294.

The authors share their experiences and lessons learned from developing "OpenMRS-Ebola," an EHR system for the Kerry Town (Sierra Leone) Ebola Treatment Center.

Upadhyay, D., Sittig, D., and Singh, H. (2014). [Ebola US Patient Zero: Lessons on Misdiagnosis and Effective Use of Electronic Health Records](#). Diagnosis. 1(4): 283.

The authors share their hypothesis regarding the treating physician's notes from the primary encounter with the first-ever travel-associated case of Ebola in U.S. history and highlight how language and symptom description were likely chosen from pre-scripted options in the electronic health record (EHR) system, contributing to a missed diagnosis. They explain the ripple effects of diagnostic errors made in EHRs and suggest related reforms in policy and practice.

Lessons Learned: Information Technology Failure/Cyberattack

Genes, N., Chary, M., and Chason, K. (2013). [An Academic Medical Center's Response to Widespread Computer Failure](#).

The authors describe the disruption of the computer systems at Mount Sinai Medical Center in New York City on a single day, the hospital's response to the event, and subsequent modifications to emergency plans incorporating lessons learned. They found that departments that utilized a combination of electronic and paper systems were impacted less than the Emergency Department, which was completely reliant on electronic medical records.

Minghella, L. (2013). [Be Prepared: Lessons from an Extended Outage of a Hospital's EHR System](#).

The author shares her experience losing access to her facility's electronic health record system for ten days following a power outage.

Lessons Learned: Tornadoes

Makulowich, G. (2013). [Tornado Victims Benefit from Information System that Helped Doctors Quickly Access Medical Records](#). Rural Roads. 11(3): 30-34.

The author explains how the Moore Medical Center (which was destroyed by the May 20 tornado) treated, transferred, and tracked incoming and existing patients using electronic medical records.

Shin, P. and Jacobs, F. (2012). [An HIT Solution for Clinical Care and Disaster Planning: How One Health Center in Joplin, MO Survived a Tornado and Avoided a Health Information Disaster](#). Online Journal of Public Health Informatics. 4(1).

The authors explain how the use of electronic medical records (EMR) helped the healthcare community maintain operations after the Joplin tornado and emphasize the importance of incorporating EHR and information technology into emergency operations plans.

Thew, J. (2012). When Disaster Strikes: [EHRs Key in Managing Medical Emergencies](#).

Having an electronic health records (EHR) system in place allowed the St. John's Medical Center (Joplin, MO) to continue providing care even after the tornado devastated the facility and surrounding areas. The author shares lessons learned and her thoughts on the need for a nationally integrated EHR system.

Plans, Tools, and Templates

Association of State and Territorial Health Officials. (n.d.). [Improving Your Access to Electronic Health Records During Outbreaks of Healthcare-associated Infections](#). (Accessed 11/9/2017.)

The purpose of this toolkit is to help professionals working in local, state, and territorial health departments have better access to the electronic health record systems in healthcare facilities (e.g., hospitals, outpatient clinics, surgical centers) during outbreaks, including outbreaks of healthcare-associated infections.

California Association of Health Information Exchanges. (2017). [PULSE](#).

This tool allows select healthcare professionals involved in an active disaster response to access to a patient's health information during time of a large-scale emergency or disaster. Links to registration and other helpful resources are included on this webpage. (Access Cothren 2017 for related PowerPoint presentation.)

Cascella, L. (n.d.). [Weathering the Storm: Electronic Health Records and Disaster Recovery](#). (Accessed 1/4/2018.)

This article includes a list of considerations that planners can use as guidance when developing or improving information technology and electronic health records systems.

Cothren, R. (2017). [Patient Unified Lookup System for Emergencies \(PULSE\)](#).

In this PowerPoint presentation, the author provides an overview of the tool, how it is designed, and how data flows through the system.

Office of the National Coordinator for Health Information Technology. (2014). [Self Assessment Contingency Planning: General Instructions for the SAFER \(Safety Assurance Factors for Electronic Health Record Resilience\) Self Assessment Guides](#).

When electronic health records (EHR) are unavailable, this can have a negative effect on patient care and can lead to medication errors, images being unavailable, and the need to cancel procedures. The guidance in this document can help healthcare facilities establish contingency planning for planned or unplanned EHR outages.

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2016). [ASPR Fusion Tools](#).

This webpage contains links to the Fusion Analytics Dashboard, GeoHEALTH, and “Fusion Forums.” These tools can help with decision making and tactical changes during a response, as they provide visibility on electronic medical record data and other factors. The page also includes a link to “Fusion Forums,” where the public health emergency community discusses emerging technologies and trends in situational awareness and rapid decision support.

* U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2017). ASPR Electronic Medical Record (EMR) Data Share with FL Department of Health. (Contact fusion@hhs.gov for more information or to set up EMR data sharing capabilities.)

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Agencies and Organizations

Note: The agencies and organizations listed in this section have a page, program, or specific research dedicated to this topic area.

Centers for Medicare & Medicaid Services. [Electronic Health Records](#).

[Electronic Health Record Association.](#)

Healthcare Information and Management Systems Society. [Interoperability and Health Information Exchange.](#)

Office of the National Coordinator for Health Information Technology. [HealthIT.gov.](#)

This ASPR TRACIE Topic Collection was comprehensively reviewed in December 2017 by the following subject matter experts (listed in alphabetical order):

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