TRACIE

HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY

Continuity of Operations (COOP)/Failure Plan Topic Collection

10/11/2016

ASPR

ASSISTANT SECRETARY FOR PREPAREDNESS AND RESPONSE

Topic Collection: Continuity of Operations (COOP)/Failure Plan

Disasters and public health emergencies can have a significant impact on the population and critical infrastructure, and healthcare personnel and facilities are no exception. Plans that allow medical facilities and providers to sustain their mission, core essential functions and services for patients already receiving care, as well as respond to potential surges in patients with space, staffing (including leadership), and equipment/supply issues are required. The goal is to ensure continuity of operations and facilitate operational and financial recovery. The following resources highlight selected plans and planning guidance, lessons learned, tools, and promising practices for healthcare facility COOP.

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.

Must Reads

California Hospital Association. (2012.) Hospital Continuity Planning Toolkit.

> This toolkit provides examples for hospitals to follow when developing their continuity plans. It is a companion document to the California Hospital Association's Hospital Continuity Program Checklist.

Devlen, A. (2009). How to Build a Comprehensive Business Continuity Programme for a Healthcare Organisation. (Abstract only.) Journal of Business Continuity and Emergency Planning. 4(1):47-61.

> The author describes an approach to integrating risk management practices into business continuity programs for hospitals.

Dynes, S., Pixley, S. and Madory, D. (2009). Managing Risk of IT Disruptions in Healthcare Settings: A Continuity of Operations Planning Process. Proceedings of the Fifteenth Americas Conference on Information Systems.

The authors describe a risk management process to mitigate the effects of IT and Communications failures on patient care. They discuss lessons learned to assist other facilities with planning.

Federal Emergency Management Agency. (2015). Continuity of Operations.

FEMA shares links to information on continuity planning, online courses, and other COOP resources.

Kansas Department of Health and Environment. (n.d.) Continuity of Operations Plan Guidance Document. (Accessed 10/21/15.)

This document contains guidance for hospitals to develop continuity of operations plans, and includes a checklist of required elements and a template for an annex to be completed and attached to a hospital's Emergency Operations Plan.

Lesperance, A. and Miller, J. (2009). Preventing Absenteeism and Promoting Resilience Among Health Care Workers in Biological Emergencies. Pacific Northwest National Laboratory.

The authors interviewed managers and emergency planners at hospitals and public health agencies to determine factors associated with health worker absenteeism during a biological emergency. They present data on expected absenteeism rates and individual determinants of absenteeism, and provide recommendations for hospitals, emergency medical services organizations, public health organizations, and government agencies to minimize absenteeism. Though not specific to COOP, this document provides guidance on a key facet of maintaining hospital operations.

Smith, D., Paturas, J., Tomassoni, A., and Albanese, J. (2011). Resource Allocation: An Approach for Enhancing Hospital Resiliency. (Abstract only.) Journal of Business Continuity and Emergency Planning. 5(2):140-9.

This article describes a model for evaluating and assigning staff for emergency response in the hospital setting. The authors designate those staff that are not assigned to an emergency support function to augment those that are. In this way, surge capacity is achieved using only internal resources.

Tosh, P., Feldman, H., Christian, M. et al. (2014). Business and Continuity of Operations: Care of the Critically Ill and Injured During Pandemics and Disasters: CHEST Consensus Statement. Chest. 146(4 Suppl):e103S-17S.

The Business and Continuity of Operations Panel of the American College of Chest Physicians developed a series of questions related to supply chain vulnerabilities during disasters that healthcare facilities should be asking as they create their response plans. The authors provide 18 suggestions to mitigate these vulnerabilities focused on medication/ medical supply shortages and continuity of information technology (IT) operations.

U.S. Department of Health and Human Services, Office of the Assistant Secretary of Preparedness and Response. (2015). Healthcare COOP and Recovery Planning: Concepts, Principles, Templates and Resources.

This guide includes an overview of healthcare continuity of operations planning, customizable templates, and other related resources.

U.S. Department of Homeland Security, Office of Cyber and Infrastructure Analysis. (2014). Sector Resilience Report: Hospitals.

This report features information on the "Hospitals Segment" within the Healthcare and Public Health Sector and Direct Patient Healthcare Subsector. The authors share results from assessments and recommendations for improving system and facility resilience.

Education and Training

Boston Public Health Commission, DelValle Institute for Emergency Preparedness. (n.d.) Continuity of Operations (COOP) Planning: Awareness. (Accessed 10/21/15.)

This hour-long course provides an overview of continuity of operations planning and how it supports maintenance of essential functions during emergencies or disasters. It is targeted to hospital, community health center, and long term care managers responsible for developing a COOP plan.

Colorado Hospital Association. (2013). Continuity of Operations Planning.

This page links to an e-learning platform consisting of continuity guidance, tools, templates, and plan examples for small and rural hospitals.

Federal Emergency Management Agency, Emergency Management Institute. (2010). IS-522: Exercising Continuity Plans for Pandemics.

This eight-hour course covers fundamental continuity principles and processes and a focused exercise on the special continuity requirements for pandemics.

Federal Emergency Management Agency, Emergency Management Institute. (2013). IS-520: Introduction to Continuity of Operations Planning for Pandemic Influenzas.

This hour-long course provides an overview of pandemic influenza and strategies for continuity during a pandemic.

Federal Emergency Management Agency, Emergency Management Institute. (2013). IS-523: Resilient Accord – Exercising Continuity Plans for Cyber Incidents.

This three-hour online course provides an overview of continuity of operations and discuss how to execute continuity operations during a cyber-security event.

Federal Emergency Management Agency, Emergency Management Institute. (2013). IS-546.A: Continuity of Operations Awareness Course.

This hour-long course provides participants with a basic understanding of continuity of operations planning.

Federal Emergency Management Agency, Emergency Management Institute. (2013). IS-547.A: Introduction to Continuity of Operations.

This 2-hour course describes the Continuity Management Cycle and how it should be used to develop a plan.

Federal Emergency Management Agency, Emergency Management Institute. (2014). IS-525: Guardian Accord (GA) Workshop.

This four-hour online course provides instruction on the importance of incorporating the specific risks of terrorism into continuity planning.

Federal Emergency Management Agency, Emergency Management Institute. (2015). The Continuity Excellence Series.

The Continuity Excellence Series provides a curriculum for earning a certificate as either a Professional Continuity Practitioner (Level I) or Master Continuity Practitioner (Level II).

Matthews, G. (2005). Maintaining Business Continuity After a Public Health Disaster. University of Washington, Northwest Center for Public Health Practice.

This hour-long webinar discusses business continuity and recovery by summarizing lessons learned from SARS in Toronto and Hurricane Katrina in New Orleans.

Rucks, A. (2008). Continuity of Operations Planning. South Central Preparedness and Emergency Response Learning Center.

This hour-long course provides an overview of continuity of operations planning concepts and principles. The course has four modules: 1. Introduction to Continuity of Operations Planning; 2. Developing a Continuity of Operations Policy; 3. Clinical Aspects of Blast Injuries; and 4. Practical Ideas about Continuity of Operations Planning.

San Diego State University, California-Nevada Public Health Training Center. (2013). Continuity of Operations Planning.

This 30-minute course provides guidance to private, government, and non-profit entities on continuity of operations planning. Topics include: prioritization of business activities

and suspension of non-essential functions; use of alternate facilities, supplies, and means of communication; protecting vital information; and chain of succession.

*Training and Education Collaborative System - Preparedness and Emergency Response Learning Center. (2013). Expanding Medical Surge Outside Hospital Settings.

This hour-long course discusses continuity of operations planning for a community health center, and describes how to develop protocols to allow a community or regional health center to supplement hospital care during an emergency.

Event-Specific Lessons Learned

*Abir, M., Jan, S., Jubelt, L. et al. (2013). The Impact of a Large-Scale Power Outage on Hemodialysis Center Operations. (Abstract only.) Prehospital and Disaster Medicine. 28(6):543-6.

The authors provide survey results for 36 dialysis centers affected by a wide-scale power outage in 2012. They found that those with pre-existing plans, including provisions for back-up generators and referral agreements with other dialysis centers, offered continuity of care to their patients.

Arrieta, M.I., Foreman, R.D., Crook, E.D., and Icenogle, M.L. (2008). Insuring Continuity of Care for Chronic Disease Patients After a Disaster: Key Preparedness Elements. American Journal of Medical Sciences. 336(2):128-33.

The authors interviewed 30 key informants (KI), including health and social service providers that provide healthcare to the under- and uninsured along the Mississippi and Alabama Gulf Coast. Pre-disaster issues of importance were patient education and preparedness; evacuation guidance and support; planning for special medical needs shelters; and health care provider preparedness. Post-disaster issues were communication; volunteer coordination/credentialing; and donation management, particularly for medications.

Arrieta, M.I., Foreman, R.D., Crook, E.D., and Icenogle, M.L. (2009). Providing Continuity of Care for Chronic Diseases in the Aftermath of Katrina: From Field Experience to Policy Recommendations. Disaster Medicine and Public Health Preparedness. 3(3):174-82.

The authors interviewed 30 key informants (KI), including health and social service providers that provide healthcare to the under- and uninsured along the Mississippi and Alabama Gulf Coast. Respondents indicated that mental health, diabetes mellitus, hypertension, respiratory illness, end-stage renal disease, cardiovascular disease, and cancer were medical management priorities after a disaster. The most frequently mentioned barrier to providing care was maintaining continuity of medications. Inaccessible medical records, poor patient knowledge, and financial constraints also impacted care. Implemented or suggested solutions included better pre-disaster patient education; support for electronic medical records at community health centers; and better management of donated medications/medical supplies.

*Genes, N., Chary, M., and Chason K. (2013). An Academic Medical Center's Response to Widespread Computer Failure. American Journal of Disaster Medicine. 8(2):145-50.

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.

Kirsch, T., Mitrani-Reiser, J., Bissell, R. et al. (2010). Impact on Hospital Functions Following the 2010 Chilean Earthquake. Disaster Medicine and Public Health Preparedness. (Abstract only.) 4(2); 122-128.

The authors describe loss of functions and structural damage experienced by hospitals in Chile following a major earthquake. Loss of communications capability was cited by hospital administrators surveyed as being most problematic.

*Lei, J., Guan, P., Gao, K. et al. (2014). Characteristics of Health IT Outage and Suggested Risk Management Strategies: An Analysis of Historical Incident Reports in China. International Journal of Medical Informatics. 83(2):122-30.

The authors identified and characterized 116 health information technology outage incidents in China. They found that about 70% of outages occurred in the morning and over 50% disrupted patient registration and payment systems. The main causes for outages included software defects, overcapacity issues, and malfunctioning hardware.

Matthews, G. (2005). Maintaining Business Continuity After a Public Health Disaster. University of Washington, Northwest Center for Public Health Practice.

This hour-long webinar discusses business continuity and recovery by summarizing lessons learned from SARS in Toronto and Hurricane Katrina in New Orleans.

Porth, L. (2012). Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011. Missouri Hospital Association.

This report describes response and recovery operations by several hospitals during the 2011 natural disasters in Missouri. It summarizes lessons learned, with a focus on the Joplin tornado.

*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).

This article describes the planning one health center undertook to secure its data so that it could be accessed after a disaster, and discusses why healthcare information technology must be a priority focus for planning. The authors advocate for increased federal funding and clear guidelines from federal planning partners in support of physical security, data back-up, and redundancy planning, as well as staff training to support these technology needs.

General Information

*California Hospital Association. (n.d.) Continuity Planning. (Accessed 10/21/15.)

This website links to webinars, conference presentations, toolkits, and guidance documents to help hospitals create business continuity plans.

Devlen, A. (2009). How to Build a Comprehensive Business Continuity Programme for a Healthcare Organisation. (Abstract only.) Journal of Business Continuity and Emergency Planning. 4(1):47-61.

The author describes an approach to integrating risk management practices into business continuity programs for hospitals.

Epstein, B. and Khan, D.C. (2014). Application Impact Analysis: A Risk-Based Approach to Business Continuity and Disaster Recovery. (Abstract only.) Journal of Business Continuity and Emergency Planning. 7(3):230-7.

This article discusses Application Impact Analysis, and a risk-based approach to business continuity planning that considers business aspects such as Financial, Operational, Service Structure, Contractual Legal, and Brand.

Federal Emergency Management Agency. (2015). Continuity of Operations.

FEMA shares links to information on continuity planning, online courses, and other COOP resources.

Geelen-Baass, B.N. and Johnstone, J.M. (2008). Building Resiliency: Ensuring Business Continuity is on the Health Care Agenda. Australian Health Review. 32(1):161-73.

This paper discusses an Australian hospital's experience developing a business continuity planning framework, including key issues considered and how the planning effort was conducted.

Glendon, L. (2013). A Winning Combination: The 3Cs of Business Continuity. Journal of Business Continuity and Emergency Planning. 7(1):44-55.

This article discusses the three Cs of continuity planning: contingency planning; continuity capability; and crisis response. The author contends that all three are needed to develop a robust response to emergencies or disasters.

Lesperance, A. and Miller, J. (2009). Preventing Absenteeism and Promoting Resilience Among Health Care Workers in Biological Emergencies. Pacific Northwest National Laboratory.

The authors interviewed managers and emergency planners at hospitals and public health agencies to determine factors associated with health worker absenteeism during a biological emergency. They present data on expected absenteeism rates and individual determinants of absenteeism, and provide recommendations for hospitals, emergency medical services organizations, public health organizations, and government agencies to minimize absenteeism. Though not specific to COOP, this document provides guidance on a key facet of maintaining hospital operations.

Ohio Emergency Management Agency. (n.d.) Developing a Continuity of Operations Program. (Accessed 9/10/15.)

This presentation provides an overview of the State of Ohio's approach to building its continuity of operations program. It includes the steps the state followed and has recommended for its counties and local governments.

Paturas, J., Smith, D., Smith, S., and Albanese, J. (2010). Collective Response to Public Health Emergencies and Large-Scale Disasters: Putting Hospitals at the Core of Community Resilience. (Abstract only.) Journal of Business Continuity and Emergency Planning. 4(3):286-95.

The authors discuss the use of an Emergency Support Function framework to manage surge capacity and eliminate the need for external staff to meet patient care needs. They also reference the Joint Commission's hospital emergency preparedness standards that require hospitals to participate in community-wide response for resource coordination and allocation.

Porth, L. (2012). Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011. Missouri Hospital Association.

This report describes response and recovery operations by several hospitals during the 2011 natural disasters in Missouri. It summarizes lessons learned, with a focus on the Joplin tornado.

Smith, D., Paturas, J., Tomassoni, A., and Albanese, J. (2011). Resource Allocation: An Approach for Enhancing Hospital Resiliency. (Abstract only.) Journal of Business Continuity and Emergency Planning. 5(2):140-9.

This article describes a model for evaluating and assigning staff for emergency response in the hospital setting. The authors designate those staff that are not assigned to an emergency support function to augment those that are. In this way, surge capacity is achieved using only internal resources.

Snider, J. (n.d.) Hospital Resilience: Business Continuity Planning for Disasters. (Accessed 10/21/15.) Henry Ford Hospital and Health Network.

This presentation takes viewers through the business continuity planning process for hospitals.

Tosh, P., Feldman, H., Christian, M. et al. (2014). Business and Continuity of Operations: Care of the Critically Ill and Injured During Pandemics and Disasters: CHEST Consensus Statement. Chest. 146(4 Suppl):e103S-17S.

The Business and Continuity of Operations Panel of the American College of Chest Physicians developed a series of questions related to supply chain vulnerabilities during disasters that healthcare facilities should be asking as they create their response plans. The authors provide 18 suggestions to mitigate these vulnerabilities focused on medication/ medical supply shortages and continuity of information technology (IT) operations.

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2012). Healthcare Preparedness Capabilities: National Guidance for Healthcare System Preparedness: January 2012.

This document outlines eight capabilities for preparedness that should be used to develop and strengthen healthcare system emergency response capabilities.

U.S. Department of Homeland Security. (2014). Federal Continuity Directive 1. Federal Emergency Management Agency.

The Department of Homeland Security, in coordination with its interagency partners, developed this Federal Continuity Directive (FCD) to provide operational guidance to implement the National Continuity Policy. The latest update provides new policies and clarifications to existing policies to give direction for the further development of continuity plans and programs for the Federal Executive Branch.

U.S. Department of Homeland Security, Office of Cyber and Infrastructure Analysis. (2014). Sector Resilience Report: Hospitals.

This report features information on the "Hospitals Segment" within the Healthcare and Public Health Sector and Direct Patient Healthcare Subsector. The authors share results from assessments and recommendations for improving system and facility resilience.

The White House. (2007). National Security Presidential Directive-51/Homeland Security Presidential Directive-20. Federal Emergency Management Agency.

This directive establishes a comprehensive national policy on the continuity of Federal Government structures and operations and a single National Continuity Coordinator responsible for coordinating the development and implementation of Federal continuity policies. This policy establishes "National Essential Functions," prescribes continuity requirements for all executive departments and agencies, and provides guidance for State, local, territorial, and tribal governments, and private sector organizations in order to ensure a comprehensive and integrated national continuity program that will enhance the credibility of our national security posture and enable a more rapid and effective response to, and recovery from, a national emergency.

Zhong, S., Clark, M., Hou, X. et al. (2015). Development of Key Indicators of Hospital Resilience: A Modified Delphi Study. Journal of Health Services Research and Policy. 20(2):74-82.

The authors developed a framework for key indicators of hospital resilience, which they categorized into eight domains, 17 subdomains, and 43 indicators. They contend that the framework may be used for assessment purposes, as well as to inform priorities for emergency response.

Guidance/Guidelines

ASIS International. (2010). Business Continuity Management Standard.

This Standard specifies requirements for planning, establishing, implementing, operating, monitoring, reviewing, exercising, maintaining, and improving a documented Business Continuity Management System within the context of managing an organization's risks.

*Centers for Medicare and Medicaid Services. (n.d.) Emergency Preparedness for Dialysis Facilities. (Accessed 10/21/15.)

This is a guidance document for chronic dialysis centers to use in the development of their emergency plans. Pre-event planning, response, and recovery are discussed.

Federal Emergency Management Agency. (2013). Continuity Guidance Circular 1.

This document includes new policies and clarifies existing policies for the further development of continuity plans and programs for non-Federal government partners. The provisions of this circular are applicable to all levels of State, territorial, tribal, and local government organizations, as well as organizations in the private sector.

Federal Emergency Management Agency. (2013). Continuity Guidance Circular 2.

This document provides guidance and direction to non-Federal government partners for the identification and verification of their essential functions, and the Business Process Analyses and Business Impact Analyses that support and identify the relationships among these essential functions. The provisions of this circular are applicable to all levels of State, territorial, tribal, and local government organizations, as well as organizations in the private sector.

Federal Emergency Management Agency. (2013). Gaining Senior Leadership Support for Continuity Guide.

This PowerPoint presentation is meant to assist continuity program managers in their efforts to effectively convey the importance of, and need for, a viable and executable Continuity program that ensures the continued performance of an organization's essential functions during an all-hazards emergency.

Georgia Hospital Association. (2010). Regional Planning Guide for Maintaining Essential Health Services in a Scarce Resource Environment.

This document uses a pandemic influenza scenario to describe a model for identifying essential health services and planning for how to ensure their continuation in a scarce resource environment. Coordination among Emergency Support Function (ESF) 8 partners, roles and responsibilities of partners, and the need for consistent approaches to addressing ethical, legal, and risk communication issues are discussed.

International Organization for Standardization. (2012). Standards.

International Organization for Standardization (ISO) is an independent, non-governmental membership organization and the world's largest developer of voluntary International Standards. See standards ISO 22313, ISO 22301, ISO 22300, ISO27003,

ISO 27004, ISO 27031, ISO 27033-1 and ISO 27035 for business continuity-related standards.

*Kansas Department of Health and Environment. (n.d.) Continuity of Operations Plan Guidance Document. (Accessed 10/21/15.)

This document contains guidance for hospitals to develop continuity of operations plans, and includes a checklist of required elements and a template for an annex to be completed and attached to a hospital's Emergency Operations Plan.

National Fire Protection Association. (2013). NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs.

NFPA 1600 establishes a common set of criteria for all hazards disaster/emergency management and business continuity programs.

*U.S. Department of Health and Human Services, Office of the Assistant Secretary of Preparedness and Response. (2015). Healthcare COOP and Recovery Planning: Concepts, Principles, Templates and Resources.

This guide includes an overview of healthcare continuity of operations planning, customizable templates, and other related resources.

U.S. Department of Homeland Security. (2006). Pandemic Influenza Preparedness, Response, and Recovery: Guide for Critical Infrastructure and Key Resources.

This guide supports the efforts of the public and private sector Critical Infrastructure and Key Resources community and their businesses to develop and execute business continuity preparedness and response plans for a pandemic. The primary government and pandemic influenza-specific background material, references, and contacts are included. Public health and healthcare is one of the critical infrastructure areas.

Information Technology (IT) and Utility Issues

*Abir, M., Jan, S., Jubelt, L. et al. (2013). The Impact of a Large-Scale Power Outage on Hemodialysis Center Operations. (Abstract only.) Prehospital and Disaster Medicine. 28(6):543-6.

The authors provide survey results for 36 dialysis centers affected by a wide-scale power outage in 2012. They found that those with pre-existing plans, including provisions for back-up generators and referral agreements with other dialysis centers, offered continuity of care to their patients.

*California Emergency Medical Services Authority. (n.d.) Incident Planning Guide: Utility Failure. (Accessed 9/9/15.)

This document includes a series of questions to guide hospitals in planning for utility failures associated with systems such as power, water, heating, ventilation, air conditioning, medical air, vacuum, or medical gases.

Centers for Disease Control and Prevention and American Water Works Association. (2012). Emergency Water Supply Planning Guide for Hospitals and Health Care Facilities.

This document provides a four step process for the development of a hospital emergency water supply plan and includes tips for assembling the right planning team, performing a water use audit, analyzing alternatives, and developing and exercising the plan.

Dunlop, J. and Biddinger, P. (n.d.) A Framework to Support Healthcare Continuity of Operations in an Information Technology Failure: Lessons Learned From a Novel Exercise Series. (Accessed 10/21/15.) Harvard School of Public Health, Emergency Preparedness and Response Exercise Program.

This presentation discusses why healthcare IT is particularly vulnerable to failure and its negative impacts; how emergency management and IT staff can collaborate to enhance preparedness; and how to use the provided framework for continuity of operations planning aimed at mitigating the effects of IT system failure and unplanned downtimes.

Dynes, S., Pixley, S. and Madory, D. (2009). Managing Risk of IT Disruptions in Healthcare Settings: A Continuity of Operations Planning Process. Proceedings of the Fifteenth Americas Conference on Information Systems.

The authors describe a risk management process to mitigate the effects of IT and Communications failures on patient care. They discuss lessons learned to assist other facilities with planning.

Ekekwe, N. (2011). Rethink your Business Continuity Strategy. Harvard Business Review.

This brief article outlines key points to consider when preparing IT infrastructure continuity plans.

*Genes, N., Chary, M., and Chason K. (2013). An Academic Medical Center's Response to Widespread Computer Failure. American Journal of Disaster Medicine. 8(2):145-50.

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.

*Lei, J., Guan, P., Gao, K. et al. (2014). Characteristics of Health IT Outage and Suggested Risk Management Strategies: An Analysis of Historical Incident Reports in China. International Journal of Medical Informatics. 83(2):122-30.

The authors identified and characterized 116 health information technology outage incidents in China. They found that about 70% of outages occurred in the morning and over 50% disrupted patient registration and payment systems. The main causes for outages included software defects, overcapacity issues, and malfunctioning hardware.

*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).

This article describes the planning one health center undertook to secure its data so that it could be accessed after a disaster, and discusses why healthcare information technology must be a priority focus for planning. The authors advocate for increased federal funding and clear guidelines from federal planning partners in support of physical security, data back-up, and redundancy planning, as well as staff training to support these technology needs.

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2013). Planning for Power Outages: A Guide for Hospitals and Healthcare Facilities.

This document highlights issues for healthcare facilities to consider regarding power outages. It also provides a checklist of key planning considerations, and recommendations for fostering a relationship with a facility's utility company.

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2013). Planning for Water Supply Interruptions: A Guide for Hospitals & Healthcare Facilities.

This document provides information on the impact of water loss on healthcare facilities, and a series of questions for planners to use to prepare their facilities for water service interruptions.

*U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2014). Working Without Technology: How Hospitals and Healthcare Organizations Can Manage Communication Failure.

This fact sheet summarizes steps a healthcare facility can take to ensure communication during incident response when normal technologies fail.

Non-hospital Setting COOP

*Abir, M., Jan, S., Jubelt, L. et al. (2013). The Impact of a Large-Scale Power Outage on Hemodialysis Center Operations. (Abstract only.) Prehospital and Disaster Medicine. 28(6):543-6.

The authors provide survey results for 36 dialysis centers affected by a wide-scale power outage in 2012. They found that those with pre-existing plans, including provisions for back-up generators and referral agreements with other dialysis centers, offered continuity of care to their patients.

*California Association of Health Facilities Disaster Preparedness Program. (n.d.) Continuity of Operations Plan Template for Long Term Care Facilities. (Accessed 10/21/15.)

This is a continuity of operations plan template for long-term care facilities that may be customized, as needed.

Center for Infectious Disease Research and Policy, University of Minnesota. (2014). Public Health Practices Update: Emergency Continuity of Operations.

This newsletter dedicated to continuity of operations contains a healthcare section, with links to continuity planning tools for nursing homes, community health centers, and home care services.

*Centers for Medicare and Medicaid Services. (n.d.) Emergency Preparedness for Dialysis Facilities. (Accessed 10/21/15.)

This is a guidance document for chronic dialysis centers to use in the development of their emergency plans. Pre-event planning, response, and recovery are discussed.

Kopp, J., Ball, L., Cohen, A. et al. (2007). Kidney Patient Care in Disasters: Emergency Planning for Patients and Dialysis Facilities. Clinical Journal of the American Society of Nephrology. 2(4):825-38.

The authors provide recommendations for an emergency plan for dialysis patients that includes considerations for continuity of care during emergencies, and recovery in the post-disaster setting. Preparedness tasks to ensure patient safety are presented along a timeline.

Primary Care Development Corporation (PCDC) and the National Association of Community Health Centers (NACHC). (2011). Creating a Business Continuity Plan for Your Health Center.

This document discusses the core components of a business continuity plan, and how to develop plans to ensure that health centers continue to function during emergencies or disasters.

Reissman, L. (2011). Continuity of Operations (COOP) for EMS Agencies. New York State Volunteer Ambulance and Rescue Association.

This presentation discusses continuity of operations planning for EMS agencies.

*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).

This article describes the planning one health center undertook to secure its data so that it could be accessed after a disaster, and discusses why healthcare information technology must be a priority focus for planning. The authors advocate for increased federal funding and clear guidelines from federal planning partners in support of physical security, data back-up, and redundancy planning, as well as staff training to support these technology needs.

*Training and Education Collaborative System - Preparedness and Emergency Response Learning Center. (2013). Expanding Medical Surge Outside Hospital Settings.

This hour-long course discusses continuity of operations planning for a community health center, and describes how to develop protocols to allow a community or regional health center to supplement hospital care during an emergency.

Yancey, A. (2014). EMS Continuity of Operations Planning (COOP). National Association of EMS Physicians.

This presentation covers continuity of operations plan elements and a detailed list of essential functions for EMS agencies. Financial considerations are also addressed.

Plans, Tools, and Templates

*California Association of Health Facilities Disaster Preparedness Program. (n.d.) Continuity of Operations Plan Template for Long Term Care Facilities. (Accessed 10/21/15.)

This is a continuity of operations plan template for long-term care facilities that may be customized, as needed.

*California Emergency Medical Services Authority. (n.d.) Incident Planning Guide: Utility Failure. (Accessed 9/9/15.)

This document includes a series of questions to guide hospitals in planning for utility failures associated with systems such as power, water, heating, ventilation, air conditioning, medical air, vacuum, or medical gases.

*California Hospital Association. (n.d.) Continuity Planning. (Accessed 10/21/15.)

This website links to webinars, conference presentations, toolkits, and guidance documents to help hospitals create business continuity plans.

California Hospital Association. (2012.) Hospital Continuity Planning Toolkit.

This toolkit provides examples for hospitals to follow when developing their continuity plans. It is a companion document to the California Hospital Association's Hospital Continuity Program Checklist.

*Kansas Department of Health and Environment. (n.d.) Continuity of Operations Plan Guidance Document. (Accessed 10/21/15.)

This document contains guidance for hospitals to develop continuity of operations plans, and includes a checklist of required elements and a template for an annex to be completed and attached to a hospital's Emergency Operations Plan.

Southeast Texas Regional Advisory Council. (2012). Continuity of Operations Plan Template.

This is a continuity of operations plan template that facilities may adapt for their use.

University of Minnesota, Center for Infectious Disease Research and Policy. (2009). Doing Business During an Influenza Pandemic: A Toolkit for Organizations of All Sizes.

This toolkit is intended to provide business leaders that are new to pandemic planning with information regarding high-priority Human Resources (HR) issues related to business operations during influenza pandemic. While some of the links in the presentation are outdated, the presentation provides a valuable overview of issues and tasks.

*U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. (2014). Working Without Technology: How Hospitals and Healthcare Organizations Can Manage Communication Failure.

This fact sheet summarizes steps a healthcare facility can take to ensure communication during incident response when normal technologies fail.

*U.S. Department of Health and Human Services, Office of the Assistant Secretary of Preparedness and Response. (2015). Healthcare COOP and Recovery Planning: Concepts, Principles, Templates and Resources.

This guide includes an overview of healthcare continuity of operations planning, customizable templates, and other related resources.

Virginia Department of Emergency Management. (2008). Local Government Continuity of Operations (COOP) Basic Plan Template.

This manual was developed to provide guidance to local governments for the development and maintenance of Continuity of Operations (COOP) plans. This manual is intended to offer both procedural and operational guidance for the preparation and implementation of a COOP plan. The COOP Worksheets correspond with Virginia's seven phases of the COOP planning process. Completing the worksheets assists in assembling the information necessary to develop the critical elements of a COOP plan.

Wisconsin Hospital Association. (2011). Inter-Facility Staffing Agreement.

Healthcare facilities may use this template to enter into agreements to share staff during emergencies or disasters.

Yale New Haven Health System, Center for Emergency Preparedness and Disaster Response. (2012). Pre-Storm Checklist.

This checklist provides hospital emergency planners with guidance on preparing to withstand the effects of a storm. Actions to be taken 72 hours, 48 hours, and 24 hours prior to the storm is included for the following departments: Administrative, Clinical Laboratory, Clinical Services, Facilities, Food and Nutrition, IT/MIS, Pharmacy, Materials Management, Respiratory Care, and Safety and Security.

Agencies and Organizations

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

California Hospital Association.

Federal Emergency Management Agency. Continuity of Operations.

Minnesota Department of Health. Healthcare Business Continuity and Recovery.

U.S. Department of Health and Human Services, Health Resources and Services Administration. Emergency Preparedness & Continuity of Operations.

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response. Healthcare COOP and Recovery Planning.

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