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Reengineering an Allergy Group Practice in Response to COVID-19: Change Management, Quality Assessment and Financial Considerations

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REENGINEERING AN ALLERGY GROUP PRACTICE IN RESPONSE TO COVID-19:
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BY

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A doctoral project submitted to the faculty of the Medical University of South Carolina
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Abstract

To date, few studies have provided a comprehensive set of requirements for outpatient medical practices to consider when preparing for complex external forces that impact clinic operations. The objective of this qualitative doctoral project is to establish a set of requirements for outpatient medical practices to consider when preparing for pandemic conditions. Using the backdrop of the COVID-19 pandemic, this single case study reviews how an allergy group practice responds to the variables presented during COVID-19 through change management, quality assessment and financial considerations lenses to assist other medical practices in developing pandemic preparedness programming.

Findings from this case study are presented within an adapted Lewin change management framework and supported by six domains found to be requisite for an effective outpatient medical practice pandemic response: risk mitigation, operational

excellence, talent considerations, clinical excellence, patient engagement and financial vitality. Annual preparedness training and response drills may assist with developing individualized criteria that supports seamless operations during uncontrollable external forces. Medical practice leaders should swiftly develop contingency plans now to better position their medical offices for a robust response during the next pandemic. Utilizing the six domains reviewed in this case study will support an individualized, effective plan to work through issues observed during a group medical practice's COVID-19 response.

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1 CHAPTER I - INTRODUCTION

1.1 Background and Need for Study

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread exponentially since discovery in late 2019. As of April 11, 2021, approximately 135.9 million individuals worldwide and 31.2 million individuals within the United States have received a confirmatory diagnosis of coronavirus disease 2019 (COVID-19), which is the respiratory and inflammatory disease caused by SARS-CoV-2 (JHUM, 2021; Adams and Walls, 2020). The effects of COVID-19 have presented many business operations and financial challenges to outpatient medical practices as a result of state stay-at-home orders that were issued in mid-March 2020 (Rubin, 2020; Lee et al., 2020). The rapidly evolving pandemic required agile changes with no blueprint for drastically changing the manner and method that health services are provided.

Outpatient medical offices have encountered personal protective equipment (PPE) supply chain constraints. Many medical practices have struggled to source PPE for frontline health services staff. Small, mid-size and large medical practices have been unable to acquire requisite supplies and equipment in an attempt to deliver basic health services for their patient populations in a safe manner. In turn, patient safety has necessitated significantly reduced clinic scheduling to promote socially distant patient encounters. Medical practices unaccustomed to providing telehealth services became operationally focused on delivering virtual health services in a manner that evolved very quickly.

Outpatient medical practices have attempted to reduce COVID-19 community spread while remaining socially conscious to aid in flattening the curve and reduce viral disease transmission within their offices (Li et al., 2020). The need to socially distance patients, alongside staff, has required significant modifications to established workflows in outpatient medical offices. As a result, COVID-19 has directly impacted the financial and business operations within many outpatient medical practices.

Overall, medical and support staff have become increasingly resourceful in supporting the needs of elderly, high-risk and immunocompromised patient populations. Many patients were initially encouraged to defer routine medical care and other non-essential services to a later date in an attempt to avoid potential COVID-19 exposures within outpatient medical offices. Medical office staff have systematically designed new processes while continually refining workflows aimed at protecting patients and in-office staff. Many of these modifications have occurred while medical offices struggled to source much needed PPE and cleaning supplies. Some offices have reconfigured existing office structures to provide one-way patient throughput along with safety barriers to reduce the risk of viral cross-contamination spread amongst staff and patients.

Additionally, staff mental and physical well-being has become more stressed and unstable as pandemic conditions have continued to increasingly evolve. Similar to other industries, health services staff have faced furloughs and layoffs -- both voluntarily and involuntarily -- as patient volumes have been reduced to lessen viral spread opportunities and cross-contamination chance encounters. Staff have faced continual and radical changes to business operations while dealing with on-going and uncertain family

constraints centered around childcare needs, school closures, routine life events and personal illness.

During the 2009 H1N1 influenza pandemic, some outpatient medical practice operational recommendations were initially issued. Mackett (2009) encourages the use of a written infectious disease preparedness plan for on-going operations in a family practice medical office during epidemic events. The Centers for Disease Control and Prevention (CDC) (2009) issued a *Medical Office Preparedness Planner* for use in primary care offices. However, this document contains a bolded disclaimer:

"It is important to note that the Medical Office Preparedness Planner is not intended to be used during an event." (p. 4)

Despite widespread emergency planning and preparedness in the acute care setting, business continuity frameworks have not been widely adopted within outpatient specialty medical offices. Global and widespread pandemic conditions in 2020 have never been experienced by most current health services administrators, health services practitioners, health services staff or patients. Therefore, outpatient specialty medical practices have been ill-prepared for the conditions experienced during the COVID-19 pandemic across the United States. A review of the literature yields minimal current suggestions for pandemic influenza planning (CDC, 2009; Barr et al., 2008; ACP, 2006); however, no evidence-based recommendations exist for operationalizing just-in-time change management techniques alongside clinical and business continuity requirements within outpatient specialty medical offices during pandemic conditions.

1.2 Problem Statement

The purpose of this single case study doctoral project is to describe the change management process utilized, quality assessments considered and financial considerations identified within an allergy group practice in response to COVID-19 and in anticipation for future pandemic situations.

The present project will utilize the qualitative methodology of descriptive inquiry (Baxter and Jack, 2008; Yin, 2003; Yin, 1999) through case study (Baker, 2011; Yin, 2003; Yin, 1999). Baker (2011) describes the use of case studies to enhance theory while connecting a set of problems to an action and yielding an outcome. The theoretical framework for this doctoral project is grounded in change management and quality assurance with the basis relying on the Lewin (1947a; 1947b) three stage change management model (Hussain et al., 2016; Suc et al., 2009; Burnes, 2004) in addition to a re-assessment stage. The pillars supporting the case study's framework include risk mitigation, talent considerations, clinical excellence, program stability, patient engagement, sourcing supplies, recovery, financial vitality and preparation for part deux while implementing and assessing change.

1.3 Research Questions and Research Hypotheses

The central qualitative research question for this doctoral project is: *How does one reengineer an allergy group practice in response to COVID-19?* Additional key questions the project will address include:

- What change management criteria should be considered during the process?
- What quality assessments should be delivered during the process?

- What financial considerations should be analyzed during the process?

1.4 Population Setting

The single case study population of this doctoral project will focus on a full-service, multi-site allergy medical group practice located within the United States. This inclusive medical practice consists of 135 locations of care spread across a 20-state footprint; 135 physicians board-certified in allergy and immunology are on-staff; 40 advanced practice clinicians are employed; and 1,200 support staff provide clinical and administrative support. Most all locations of care operate within a standard Monday through Friday office schedule. In 2019, this specific group practice professionally delivered 103,000 distinct patient office visit encounters and provided 1.2 million subcutaneous immunotherapy injections.

2 CHAPTER II - SCOPING LITERATURE REVIEW

2.1 Introduction

In November 2020, a thorough literature review was conducted to seek additional insight and knowledge of the existing published research related to the topic of reengineering an allergy group practice in response to COVID-19. Additionally, the purpose of the literature review was to evaluate findings, research methods and limitations of the current literature while supporting the development of a project design to explore how outpatient medical practices have prepared to respond to infectious disease outbreaks, significant weather disasters, terrorism attacks and mass casualty events. The literature search was managed through a set of Medical University of South Carolina (MUSC) online library databases (including PubMed, PsycInfo and ProQuest Health Administration) and Google Scholar. A variety of Boolean search criteria, including "outpatient" OR "medical office" joined by "disaster planning" OR "disaster preparation" OR "pandemic plan", was used as the literature search terms. The results were limited to full text publications in the English language from January 1995 to November 2020. A small number of published research resulted; therefore, the search terms were expanded to include "inpatient" OR "hospital" OR "outpatient" OR "medical office" joined by "disaster planning" OR "disaster preparation" OR "pandemic plan".

This literature review begins with definitions and identifies three dominant themes found throughout the existing literature. Much of the published literature pertains to the acute or inpatient setting; however, it may be stratified into the adjacent outpatient or medical office context. Of note, there is currently no peer-reviewed, published research

pertaining to on-going outpatient medical practice operations during pandemic conditions. Therefore, this literature review will center around the three categories most applicable to the outpatient medical practice setting, including:

- general operations and resources,
- human resources and resiliency and
- guidelines and checklists.

2.2 Historical Framework

Jester et al. (2018) discuss advances in medical care and infection prevention mitigation strategies that are vastly different compared with the 1918 H1N1 influenza pandemic. Laboratory and imaging diagnostic technologies have improved significantly. Innovative discoveries supporting viral and bacterial sequencing and point of care testing are readily available today. Advanced research yielding new findings and supporting a framework to produce vaccines that reduce community spread has expanded. Pharmaceutical treatment options are presently available to shorten the duration and severity of influenza symptoms. Finally, full personal protective equipment is now available from a variety of manufacturing sources. These advances -- coupled with government agencies and private health services entities -- to stockpile and inventory voluminous supplies that may be deployed during significant disasters and public health events is present today.

Hashim et al. (2012) identify six essential characteristics that make hospital and health system pandemic preparedness successful during the calendar year 2009 H1N1 pandemic. These six themes yield an effective preparedness plan, which includes active

organizational and community communication, inter-agency coordination and collaboration, capacity flexibility for patient care physical space, operational adaptability, empowered leadership and collective support from all team members (Derrett et al., 2014). Hashim and colleagues conclude that collective emergency preparedness training exercises yield the most effective responses leading up to, and including, significant public health emergencies.

Nasef et al. (2010) describe how an outpatient medical clinic failed to plan for an infectious disease outbreak in Canada. This unplanned event led to substandard care and poor developmental delay identification within a population of at-risk, low-birth-weight children. Nasef and colleagues demonstrate the importance of advanced contingency planning prior to a serious health event commencing. Further, these findings highlight the need for health care providers to develop alternative outpatient care plans when live, in-person clinics are required to unexpectedly close. Discoveries identified within this study are timely given the COVID-19 pandemic conditions experienced by many outpatient medical clinics in calendar year 2020.

Nonetheless, the majority of published literature is centered around actual health system or hospital inpatient care experiences (Chang et al., 2020) recognized during significant natural and man-made emergency events, such as Hurricane Katrina (2005), September 11 terrorist attacks (2001), Anthrax attacks (2001), Novel Influenza A "H1N1" (2009), Severe Acute Respiratory Syndrome "SARS" (2003), Ebola Virus Disease "Ebola" (2014-2016), major flooding and earthquakes. Additional research exists surrounding disaster preparation and planning during significant weather-related disasters and domestic terror-initiated events. The literature collated for this review consists of peer-reviewed

journal articles, published dissertations, government reports, online journals and other scholarly publications.

2.3 Definitions

Hick et al. (2010) present a planning document with emphasis related to high acuity inpatient care settings. Runkle et al. (2012) and Hick et al. (2010) detail some useful definitions that have applicability within the outpatient medical office setting:

- Mass casualty event - an event occurring that produces large numbers of patients that may be treated within an existing care facility utilizing established resources.
- Disaster event - an event occurring that produces large numbers of patients and requiring resources beyond those typically found within an existing care facility.
- Crisis standard of care - enhanced modifications within the normal delivery of care that requires significant alterations to normal operations and increased utilization of resources during an event.
- Surge capacity - the maximum number of patients, over and beyond routine, that may be admitted within a facility while utilizing available resources and without causing declines in acceptable standards of care.
- Conventional resource utilization - using operational clinical care areas and resources in the manner in which they were designed.
- Contingency resource utilization - using significantly modified clinical care areas and resources in manners in which they were not designed.
- Standard operating procedure - the process of utilizing established procedures and resources under routine, everyday delivery of care.

- Contingency operating procedure - the process of utilizing previously planned procedures and resources in an enhanced and expanded manner under crisis situations.
- Emergency preparedness disaster planning - the process of identifying needs and applicable responses to emergency situations in an effort to prepare for worst-case scenario events.

2.4 General Operations and Resources

Making significant alterations to standard business operations as a result of a disaster event requires planning by many subject matter experts in order for the execution to be successful. A disaster plan cascaded to all stakeholders with opportunities to practice the planned implementation before an actual disaster event occurs is key for an organization's disaster response. Conventional resources required for on-going business operations should be identified within the planning document and organizations should work to source and maintain resource inventories in the event that supply chains become disrupted during significant events.

Älgá et al. (2018) discuss the importance of utilizing staff feedback questionnaires in assessing operational preparedness within the primary care office setting. Results from staff feedback will highlight the importance of proactive communication techniques while conducting routine training and preparedness exercises. Staffing assessments provide an opportunity to ascertain personnel and commodities anticipated during significant events that alter operations.

Alves et al. (2015) provide a thorough interpretation of emergency preparedness management within health services organizations. Incorporating daily operational management techniques within each business unit supports organizational preparedness. Daily operating procedures should be assessed with considerations for significantly altered patient volumes during disaster events. This highlights the importance of actively engaging operational teams alongside emergency management teams to ensure a well-coordinated response. Cohesive collaboration is key to overcoming disaster events that may lead to additional stressors on the health services organization.

Ardagh et al. (2012) describe the operational insight gleaned from a hospital's rapid disaster response to a 6.3 magnitude earthquake. This international facility's detailed response was a result of a successfully executed disaster response plan that had been practiced numerous times prior to a natural disaster event. A debriefing from the actual incident supports the need for a well-orchestrated operational response with clearly defined leadership roles directing resources based on planned emergency preparedness response plans.

Bishop et al. (2009) review an international perspective on the mitigation activities used during the calendar year 2009 H1N1 response. The most pressing discoveries during this organizational response include the coordinated release of antiviral medications and personal protective equipment from organizational and national stockpiles along with consistent public awareness messaging. The latter was geared towards reducing community spread of H1N1 by symptomatic individuals while educating the public on methods of disease transmission. Once a vaccine became available, the national messaging

became more focused on community recovery. The subsequent vaccination programs supported the public health efforts aimed at ending the pandemic.

Lurie (2009) highlights the need for an efficient process to allocate personal protective equipment, medical supplies and pharmaceutical resources during a national disaster response. A well-coordinated response to a national health emergency requires adequate coordination from government agencies and individual health systems; therefore, an integrated inventory system for sourcing and deploying supplies or equipment should be detailed in disaster and emergency management plans.

Chambliss and Tolan (2020) address the importance of operational contingency plans for use during disasters and significant events. These plans should be reviewed annually so that necessary actions may be employed to support baseline acute care laboratory operations in addition to the surge volume with more patients requiring diagnostic services. Chambliss and colleague also highlight the need to establish adaptable staffing plans, supply procurement and both essential and non-essential testing in order to meet patient surges for specific testing diagnostics. Additional recommendations include active and continuous communication methods at all levels of the organization -- bedside clinical staff to environmental services to patient access -- such that everyone is aware of decreased laboratory testing portfolio operations during critical events.

Cinti et al. (2008) describe how the Michigan Department of Community Health created a public health emergency preparedness plan for use during influenza pandemic events. Cinti and colleagues address operational changes required within the outpatient primary care setting in order to create additional capacity for acutely ill influenza patients. It is important to note that a cohesive and consolidated approach between health systems

and independent providers should be facilitated during emergency management planning to yield a cohesive response. Established plans to support community providers in triaging lower acuity conditions and chronic disease management will assist with scaffolding surge capacity as hospitals admit more acutely ill patients.

Federal regulations pertaining to patients with end-stage renal disease require health services entities to establish both standard operating procedures and contingency operating procedures. Kenney (2007) discusses the federal requirements that providers must support while caring for this population. Specifically, health services providers must establish patient communication plans, which must be reviewed annually and revised along with standard treatment plans to remain compliant. Both the communication plan and the care plan are integral documents to ensure end-stage renal disease patients receive timely care during disaster events. Kopp et al. (2007) also discusses the importance of active communication with end-stage renal disease patients -- before the disaster and immediately after the disaster -- to ensure the patient remains compliant with coordinated care and treatment plans.

Copeland (2005) highlights the planning and coordination that end-stage renal failure providers should address with local emergency management agencies and regional dialysis facilities. Facilitating disaster response planning efforts with inter-agency support is the cornerstone in delivering dialysis services during emergent events. Further considerations center around sourcing supplies, specifically sterile water, which are essential to operationalize treatment care plans for patients requiring dialysis treatment modalities.

Courtney et al. (2009) recommend a collaborative approach for consumable resource coordination during disasters that lead to rising patient surges at acute facilities. Emergency preparedness and planning exercises organized at the federal level and synchronized at the local level tend to yield the most effective disaster response. Courtney and colleagues support entity coalitions that assist individual health care facilities during widespread emergency events. This emergency response framework includes care, collaboration and communication strategies, supply resource allocation, shared staffing matrices and medical triage for specified acuity level in hospital facilities.

Debacker et al. (2016) support emergency preparedness simulation modeling to assess acute facility readiness while grading response strength to mass casualty events. Factors contributing to an effective and coordinated facility response include defined operational policies, communicated triage plans and re-directed medical supplies based on patient acuity levels. Emphasis towards medical and pharmaceutical supply distribution should be prioritized by the receiving facility's surge capacity and staffing levels available to care for patients. The coordination of personnel, resources and patient triage are significant considerations when developing a fully functional emergency preparedness framework.

DeLia and Wood (2008) describe the federal government's benchmarks for hospital surge capacity. These criteria are useful in establishing acute facility baselines during all types of disaster events while considering growing disease spread within communities. Emergency response preparations should focus on the facility's ability to swiftly adjust staffing, medical supplies and bed resources while responding to increased patient surges. On-going readiness assessments and preparedness drills guide successful organizations in

determining if planned operational modifications are sustainable while accommodating patient surge capacity during significant events.

Phillipp et al. (2009) acknowledge much work needs to be done within outpatient medical practice settings to operationally prepare for public health emergencies along with natural and man-made disasters. An astounding 95.6% of outpatient medical practices have not participated in any emergency preparedness drills in tandem with government agencies and over 67% do not conduct regular preparedness drills in everyday practices. Notably, independent medical practices -- not associated with larger health systems -- do not have the resources or time to participate in emergency preparedness and planning exercises (Phillipp et al, 2009; Tivis and Gans, 2009).

Lauer et al. (2008) describe the role of primary care and community physicians during prior public health emergencies. Lauer and colleagues then compare current primary care physician involvement in preparations for future significant health events. Their findings support that primary care physicians should be more actively involved with public health disaster planning; however, many are reluctant to devote dedicated time to planning activities. Lim et al. (2013) found that disaster planning costs and time spent away from patients are limiting factors for community physicians to actively participate in emergency preparation plans and drills.

Hanfling (2013) discusses inclusion of outpatient community physician partners as integral participants in disaster response planning. Historically, this group of healthcare providers has not been actively engaged in emergency scenario planning. As a result, responses to significant emergency events have been less than optimal. Accommodating increased patient surges while continuing to deliver routine care for their established

patients has been problematic. Considerations for alternative care settings during emergency situations and the staffing required to operationalize a fully functioning, multidisciplinary clinic should be planned in advance. It is important to note that providers and support staff within the outpatient setting may experience personal and family obligations as a result of the event while attempting to provide much needed health services to patients at the same time of the actual emergency event.

Der-Martirosian et al. (2014) present the importance of patient educational programs in the primary care medical office setting as providers promote disaster readiness for populations with chronic disease. Primary care providers may recognize how the triad of patient medical, psychological and physical needs are neglected during disaster events. Outpatient primary care medical offices should assist with contingency planning for patients with chronic medical conditions. Requisite patient and family needs should be addressed regularly with these patients such that families are adequately prepared if they are unable to seek primary care services during times of disasters and/or public health emergency events.

Dunnick et al. (2016) provide evidence that outpatient urgent care centers are not prepared to execute a comprehensive contingency plan during disaster events. The adoption of emergency disaster planning documents and annual preparedness drills may assist with better coordination for outpatient care facilities. Well-vetted plans support outpatient medical practices with scaffolded preparation for responding to significant events that may yield patient surges in this care setting. Continued states of readiness coupled with disease surveillance are essential for outpatient operations while public health agencies attempt to detect and monitor community disease spread -- including effects of

bioterrorism. Farley and Weisfuse (2011) also provide a commentary for electronic reporting and monitoring of communicable disease spread during disaster events. It is important for outpatient medical providers and local public health entities to monitor for these events. Patient surges significantly stress higher acuity access points as increased patient encounters are compounded across the health services landscape.

Frogel et al. (2019) present an emergency preparedness framework for handling pediatric patient surges within the outpatient and urgent care setting. These workplans match pediatric needs with an appropriate location of care best suited for handling pediatric assessments, diagnostics, imaging and laboratory services. Additionally, this type of preparedness plan assists with scheduling providers and ancillary professionals who have requisite qualifications and training to work with pediatric patients. As such, any pediatric emergency preparedness plan should allocate these resources accordingly based on acuity level of the pediatric population and the ability to render pediatric services in a safe and adequately stocked location of care.

Edwards et al. (2007) document the experience of caring for a large volume of Hurricane Katrina evacuees within an outpatient primary care clinic. Scaffolding to adequately plan for and render care during patient surges are important for the entire health services ecosystem. Outpatient medical offices treating patients during natural disasters and emergency conditions should routinely assess their state of readiness as part of a community-led preparedness plan. During times of crisis, primary care providers may assist in diverting patients from higher acuity facilities so that evacuated patients with chronic conditions and minor injuries can seek care without overwhelming hospital emergency departments and other high acuity facilities.

Gainey et al. (2018) provide a disaster response training discussion in terms of population health services for rural communities. These primary care adjunctive services are helpful in triaging and assessing basic health care needs within the community as a means of addressing patient needs during significant events. During disaster situations, extensions of primary care assist with directing and routing patients during surges that may overwhelm certain care locations. These opportunities support outpatient medical providers while they are attending to more acute patient needs during a disaster event.

Haffer et al. (2002) describe the disaster response plan implemented while quickly deploying a prophylaxis clinic during a domestic bioterrorism event. In this instance, a multidisciplinary team of health care professionals operationalized a high-volume patient flow clinic while clinically assessing and treating 18,000 patients over a 14-day period. The collaborative team established a sustainable framework for use in other biological risk events: matching patient volumes with a diverse staffing level -- including paid talent and volunteers; on-going resource procurement; documenting processes and modifying workflows as demanded by patient volumes; providing regular communication briefings with all staff so that everyone is informed of process changes, updated guidance and assessments; and debriefing at the conclusion of the disaster event such that improvement opportunities are documented for use during future disaster operations.

Hick et al. (2010) identify planning items to support growing patient surges within the acute inpatient setting. Emergency preparedness plans may include converting administrative, non-clinical space into clinically appropriate care areas that may accommodate higher acuity patients. Additionally, detailed planning for additional supply and technology sourcing to accommodate higher acuity patient loads is essential for a

successful emergency preparedness plan. Finally, detailed contingencies for bedside nursing and ancillary staffing needed for higher acuity patient demands with state and local emergency management personnel collaboration are very important considerations for an adequate response during emergency patient surge situations.

Hollander and Carr (2020) present opportunities that advanced technology may support while accommodating patient surges during significant events. Patient triage, on-demand care and advanced algorithm screenings performed via telehealth platforms while reducing physical stressors on hospital emergency rooms and outpatient care settings are useful. Thorough planning for these opportunities enables facilities to flex staffing levels so that talent is practicing at the top of their license while accommodating higher acuity census levels across a variety of care settings. Joshi and Lewiss (2020) describe how a group of primary care offices within an academic medical center ramp up outpatient telehealth services for routine and lower acuity care during the COVID-19 pandemic.

Kelen et al. (2006) detail a reverse triage disposition and discharge algorithm that supports proactive discharge planning to create additional inpatient facility surge capacity. This framework is useful to identify appropriate patients for early discharge when acute facilities need additional surge capacity while responding to disasters or significant public health events. Proper support planning in consultation with inpatient care providers and in coordination with non-acute outpatient providers supports the basis for this type of emergency preparedness plan. Well-coordinated inpatient discharge planning also provides an opportunity for family members to care for the patient within the home setting. This may reduce stressors associated with travel to and from the acute facility during disaster events.

Kort et al. (2005) offer considerations for emergency preparedness planning with inpatient health care facilities. Guidance includes a clear delineation of roles and responsibilities within and outside of the organization; a well-developed staffing plan that considers talent health and safety while managing work-life balance; both an internal communication plan and an external community communication plan; distribution plans for pharmaceuticals, vaccines and emerging treatment modalities collaborated by a multidisciplinary group of stakeholders; and engagement of community resources alongside strategic partners while developing the emergency plans. A comprehensive, multi-faceted and well-planned emergency preparedness plan is paramount to execution during the actual event.

Labarda et al. (2017) discuss findings from a retrospective review of hospital facilities after a significant weather event. Their research supports the need for cohesive planning, collaboration and flexibility with many stakeholders while responding to adverse events. Additionally, Labarda and colleagues highlight the importance of detailed coordination while working in tandem with other regional health services facilities and local government agencies leading up to resultant patient surges.

Lin et al. (2012) and VanVactor (2012) identify a set of operational inefficiencies that many health services agencies experienced during prior adverse health events. Attempting to correct inadequate supply inventories requires collaboration from many stakeholders -- suppliers, distributors, vendors and delivery agents. Being able to respond to a public health crisis while protecting health care workers requires adequate inventories and satisfactory logistics to move the resources from centralized locations into strategic access points so that staff may utilize the resources.

Lodha and Kabra (2020) discuss the importance of treating acute and chronic medical conditions during public health emergencies. Utilizing alternative methods, such as telehealth, to assess and treat patients during pandemic events has increasingly become a widely accepted standard of care. These technologies have proven to be an acceptable manner in providing requisite, yet routine, health services, specifically for chronic disease management. Telehealth is an effective method to accommodate social distancing while protecting patients and health care workers from contagious disease transmission and maintaining business operations for many health services organizations.

Lurie (2009) highlights the need to continually evaluate the delivery of health services so that those individuals needing on-going care may be managed appropriately during public health emergencies. Advanced planning enables health care providers to shift talent and resources along with business operations from one setting to another while continuing to provide necessary care via a non-traditional delivery of care. Magoon (2020) discusses how telehealth revolutionized the manner in which health services have been delivered remotely during the COVID-19 pandemic.

Toner et al. (2017) and Meredith et al. (2010) find that health services organizations are often unprepared to physically triage and treat surges in psychological and mental health patients during disaster events. Organizational emergency planning should be inclusive of mental health professionals to provide guidance in supporting the needs and psychological health of patients seeking behavioral medicine services during significant public health stressors. Providing on-going mental health services, within an appropriate care setting, during disaster recovery is paramount for communities to rebound from detrimental impacts that may be a result of the significant event.

Osgood et al. (2015) detail an organizational response to a calendar year 2013 domestic terrorism event in the United States. The organizational response was executed with precision based on the organization's previously developed disaster response plan. Osgood and colleagues highlight the importance of removing barriers across health services organizations as an "all hands on deck" response is employed while responding to patient surges. An effective response may accommodate an influx of patients while mitigating immediate financial impacts as the organizations attempt to flex supplies and talent resources to the immediate disaster event that may occur without warning. Osgood et al. (2015) also highlight the power behind emergency preparedness drill training so that organizations may deliver clear communications while operationalizing a seamless response to disaster events.

2.5 Human Resources and Resiliency

Lim et al. (2013) and Lauer et al. (2008) establish a set of emergency preparedness resiliency criteria based on feedback from primary care physicians. Requirements for encouraging and preparing community primary care providers for disaster events include organizational leadership, organizational training and education, organizational support for team members and their family units and coordinated communication throughout an organization to support the disaster response within the community (Lim et al., 2013). An integrated plan for active communication alongside family support resources are requisites for engaging team members throughout health services organizations.

Professional medical staff resiliency is a major concern among physicians. Active communication related to response plans while the significant event is occurring is

paramount for fostering medical staff buy-in. Considerations for adequate staffing during surge situations should be addressed during emergency preparedness planning. Additionally, an education component at all levels of an organization may be implemented so that staff are aware of operational adjustments and expectations during the actual response (Edwards et al., 2007).

DeLia and Wood (2008) describe human resources considerations during emergency responses. Establishing staffing benchmarks to best care for adult and pediatric populations during a disaster response is necessary for an effective implementation. Planning for adequate nursing and ancillary staff requirements as an organization responds to disaster events is paramount in delivering quality patient care and essential for on-going talent support during the response.

Hanfling (2013) stresses the importance of emergency preparedness training and education across all organizations. Disaster response and awareness educational programs assist the workforce in preparation for working through significant professional stressors and responding collaboratively in order to provide medical care to patients. Hanfling also suggests an array of educational opportunities that support information sharing, preparedness training and planning mindfulness. Collectively, these opportunities provide a framework to better prepare outpatient physician practices for working through significant events.

Joyner et al. (2013) describe the role of organizational cultural preparedness during a disaster response. On-going education coupled with mock emergency preparedness drills assist health services organizations in effectively managing staff responses to a natural disaster event. A cohesive staffing plan will support the organization's mission and

prevent operational collapse during a significant disaster response. Recognizing that the organization may be required to cease operations for a period of time during the response is important; however, maintaining staff resiliency while working through the response will assist an organization in preparation for reopening during disaster recovery.

Labarda et al. (2017) discuss the importance of integrating frontline operational experts in disaster preparedness plans, training and execution. Their findings support assimilated disaster response training into daily operational workflows. McFarland (2001) highlights teamwork, creative and collaborative strategies through preparation for a worst-case scenario as criteria for ensuring that organizational resiliency is maintained during natural disasters. These operational requirements are key in supporting talent resiliency efforts during disaster responses (Overton et al., 2020).

Qureshi et al. (2005) identify a set of barriers that may foster problems for qualified health care professionals in reporting for duty during disaster and public health emergencies. Transportation constraints plus a lack of supervision or care for children, elderly parents and pets rank as the most pressing personal obstacles for health care workers. Health services facilities should include these factors and plan accordingly to support staff while producing emergency preparedness plans. Resiliency programs targeting access to reliable transportation and quality family care for health care workers' family members during a disaster response are helpful adjuncts. These important factors are key considerations in operationalizing increased staffing levels during patient surges.

Similarly, Melnikov et al. (2014) find personal childcare demands as the most significant barrier preventing health care talent from reporting to work during natural disasters. Organizational disaster plans inclusive of the workforce's childcare needs are

integral for an effective response. Accommodating family childcare requirements to ensure adequate staffing levels are available during significant disaster responses must be considered in advance.

Meredith et al. (2010) conclude that health services organizations should consider staff psychological well-being when preparing for an enhanced disaster response. Adequately addressing the mental health needs of staff before an actual event will yield dividends in supporting resiliency throughout the organization during the actual event. Routinely addressing the entire work-family balance for health care workers is important in fostering a framework that can quickly shift into response during high stress emergency events.

Miller (1994) highlights the need for outpatient medical offices to include diverse roles when developing emergency response plans. Task force team members should be inclusive of representatives from a variety of roles when preparing for an organization's disaster response. Further, Miller also discusses the need for an identified incident commander charged with coordinating the organization's response during significant events. This established single point of contact may lead the response within the business unit while providing directives that produce a safe environment yielding effective patient throughput and staff resiliency.

Nasef et al. (2010) detail the importance of an inclusive, well-rounded staffing model for use during emergency responses at outpatient medical offices. Ensuring a continuity of medical care model for existing, at-risk sub-groups during a public health emergency is key for patient well-being as providers and staff can better relate to familiar established patients' needs. Failing to address the on-going needs of established patients

may lead to negative outcomes for patients who need follow-up care from providers unfamiliar with complex medical histories. Likewise, accessibility points for new patients seeking care at outpatient medical offices for the first time is important in managing patient surges within acute care settings. Providing adequate staffing resources in both the non-acute, outpatient setting as well as supporting staffing matrices consistent with increased acuity levels may assist in balancing staffing resiliency efforts during an emergency response.

Ng-Kamstra et al. (2020) examine occupational life, health and safety within health services organizations during an emergency response to pandemic conditions. Establishing an employee health program with emphasis on infection prevention measures may reduce opportunities for communicable disease spread amongst colleagues and patients. Planning for adequate personal protective equipment constraints while supporting contingencies during on-going operations is paramount during a disaster response. Plans aimed at infection mitigation strategies and vetted prior to responding to the significant event are very important. An adequate organizational response should not be impacted as a result of inadequate personal protective equipment. Contingencies for sterilizing increased employee utilization of personal protective equipment in the event of supply constraints should be established during the organization's planning exercises (Glauser, 2020) rather than addressing the need during the actual emergency response.

Proulx (2020) describes the manner in which advanced care practitioners may be utilized to extend staffing resources in both the acute and non-acute settings during significant public health crises. Supporting these professionals as they practice at the top of their license may assist the healthcare ecosystem in providing much-needed primary

care in outpatient medical practices during disaster responses. This also supports telehealth frameworks in delivering routine primary care and specialty care remotely. Additionally, advanced care practitioners allow for an extension of professional resources; thereby, acting as a surrogate to alleviate professional medical staff workload strains during high inpatient census and emergency department surges.

During significant emergency events, Toner et al. (2017) and Runkle et al. (2012) suggest that talent resiliency programs support emergency management efforts. Providers may be forced to reduce the volume of scheduled office visit availability given patient surges. Also, acuity levels may progress as patients delay routine care during the actual emergency. As a result, recovery periods following the actual disaster may also be stressful times that require additional efforts to support staff resiliency. Organizations should support talent resources during recovery periods to ensure possible staff burnout problems are addressed and staff morale is supported.

Thorne et al. (2006) and Tice et al. (2006) rationalize the need for regional emergency preparedness plans to include a broad spectrum of providers. Emergency response services, outpatient medical offices and community pharmacies are often a frontline safety-net. Community medical resources may initially identify communicable infectious disease before widespread community transmission occurs. Failing to include these pre-hospital medical services may yield an overwhelmed acute care setting as hospitals respond to growing patient surges during community disease spread.

2.6 Guidelines and Checklists

Älgá et al. (2018) demonstrate a framework to assess operational contingencies for use during emergent and disaster events. A preparation checklist assists in ascertaining facility resources and capacities that may be quickly consumed or depleted during emergency conditions. Checklists assist with contingency planning in the event that supply procurement and delivery becomes problematic during a natural disaster or other large-scale emergency situation. Maintaining and continually assessing readiness status may help facilities to quickly employ planned response strategies.

Edwards et al. (2007) list routine primary care surge capacity considerations during emergency preparedness planning. Chronic disease medication management resources are important consumables to inventory within large health services entities in order to appropriately treat displaced evacuees during disaster events. Providing evacuees with basic health services alongside behavioral health services are often critical for populations during times of disaster. Planning for these services during disaster preparation are critical to addressing urgent healthcare and behavioral health needs during crisis situations.

Suginaka et al. (2014) support an emergency preparedness plan that addresses the need for an adequate, safe water supply within acute care facilities. Addressing staff and patient needs, including hand hygiene, patient laundry, medical equipment cleaning, food service and sanitation services may be considered as emergency preparedness plans are developed. Likewise, Evans et al. (2012) detail the importance of critical electricity backup plans after significant events. Bokolo (2020) provides a listing of telecommunication requirements for both patients and staff in preparedness planning. Assessing opportunities for telehealth platform requirements -- such that providers may

virtually examine and treat patients via remote methods in a safe manner -- will assist health services providers in delivering requisite care during disaster events and recovery periods.

Addressing the unique needs of pediatric populations during an emergency response is important. Frogel et al. (2019) support guidelines and checklists developed by health services providers and ancillary staff such that the needs of pediatric populations are adequately considered during emergencies. Johnson et al. (2014) outline a clinically appropriate triage and facility resource allocation plan aimed at treating critically ill pediatric populations during surges. Kopp et al. (2007) highlight the importance of preparedness planning and resource allocation checklists while creating a thoughtful emergency response plan. This preparedness guide includes checklists to dynamically assess preparedness drill responses during an actual emergency response requiring rapid implementation.

Larsen (1991) establishes a framework for developing an emergency preparedness plan. Advanced planning assists hospital facilities with obtaining adequate resources while responding to major disasters. This framework details how an acute care facility may respond with increasing numbers of patients leading to minimal, moderate and high patient surges within the facility. Within this plan, Larsen also details the staffing levels, medical supplies and pharmaceutical inventories necessary to treat surging numbers of patients being admitted to their acute facilities.

Niska and Burt (2007) describe the growth of disaster planning in acute care settings from calendar year 2002 to calendar year 2004. Considerations during organizational responses to disaster events is paramount to ongoing operations during a

significant event. Niska and colleague also highlight the need for both inter-agency and intra-agency responses during disasters. Further, checklists for par-level personal protective equipment standards and medical supply resources, held in stockpile, for use during disaster events is very important. Organizations should inventory medical equipment requiring decontamination and the need to re-use personal protective equipment if stockpiles are significantly depleted. Additionally, organizational plans to re-purpose existing space and facilities for use during surges within acute care facilities needs to be addressed. This may also emphasize the need to quickly expand medical supply inventories in response to significant events.

Thorne et al. (2006) identify organizational education and training program guidelines that may be considered during emergency preparedness drills. This framework promotes awareness towards organizational stressors within health services facilities. Preparedness drills assist organizations with understanding how surge capacity impacts operations during significant events. Additionally, drills provide an opportunity to examine how talent resources and inventories such as medical supplies, equipment and pharmaceuticals are utilized. The need to establish a reliable communication system for use during surge events is paramount ensuring that teams are adequately prepared for significant changes to operational workflows.

2.7 Conclusion

Although emergency preparedness literature exists, there is still a large gap in knowledge regarding best practices for reengineering outpatient medical practices during pandemic situations. The literature on acute health care facility operations is vast;

however, information pertaining to outpatient medical practices is limited. This doctoral project will assist in closing the gaps supporting operational modifications during emergency or disaster events and is timely given the lived experience during the COVID-19 pandemic across the United States in calendar year 2020.

3 CHAPTER III - METHODOLOGY

3.1 Research Methods

A single descriptive case study design was utilized to examine the process for reengineering an outpatient medical practice during COVID-19. The descriptive case study methodology is a qualitative research approach that utilizes lived experience that is bound through a comprehensive data collection from multiple sources to develop a thorough understanding of the case. Most frequently, qualitative research methods are used to better understand a phenomenon when little is known about the specific topic within the current literature or when variables associated with the phenomenon cannot be easily stratified (Creswell and Poth, 2018; Baker, 2011; Crowe et al., 2011; Baxter and Jack, 2008; Yin, 2003).

The primary focus of this single case study is to describe the change management process utilized, quality assessments considered and financial considerations identified within an allergy group practice in response to COVID-19 and in anticipation for future pandemic situations. First, the case study will describe one outpatient medical practice's approach to implementing practice and management changes during the COVID-19 pandemic. These lessons learned, combined with best practices from the literature, are used to draft a comprehensive "checklist" of items that outpatient medical practices must consider when adapting care delivery during a pandemic. A Delphi technique via snowball sampling was employed to collectively determine, and reach consensus on, a comprehensive set of criteria that outpatient medical practices may utilize while preparing for and responding to pandemic conditions that impact operations. Integrating expert

experience and knowledge from qualitative research assists with forming standardized guidelines that may be utilized in actual practice (van der Linde et al., 2005).

3.2 Sample Selection

The initial Delphi request was sent to four purposefully selected recipients, based on their experience with outpatient practice management. For the snowball sampling, respondents were asked to provide contact information for an additional two respondents thought to have knowledge of the topic at hand. An additional six respondents were identified through the snowball sampling. The survey was administered electronically via a Research Electronic Data Capture (REDCap) survey, and two reminders were sent. A total of seven (7) respondents completed the Delphi, for a response rate of 70%. Each respondent was provided an opportunity to review the summary guidelines and checklist developed for reengineering an outpatient medical practice during COVID-19.

3.3 Data Analysis

Data gathered for this case study include administrative documentation, feedback from purposeful sampling and respondent feedback (Creswell and Poth, 2018; Baxter and Jack, 2008; Yin, 2003; Knafl and Breitmayer, 1989). Content analysis is utilized to consolidate vast sources of textual qualitative data into a framework, model or set of guidelines. Using an iterative process researchers read and re-read the qualitative text. A directed approach informed by the literature will be used to guide the data analysis where information from the outpatient medical practices' experiences will be categorized into the best practices from the literature. In addition, emerging categories that have not been

highlighted in the literature will be explored in greater detail (Gagliardi and Brouwers, 2012).

3.4 Instrumentation

A REDCap survey -- along with the summary guidelines and checklist -- was sent via electronic mail to respondents thought to have knowledge or expertise of reengineering an outpatient medical practice during COVID-19. These respondents were solicited to review the summary guidelines and checklist along with the electronic survey. Respondents were asked to provide feedback utilizing a Likert scale, ranging from most important to least important, for each domain listed. The survey also included an open-ended response option for free-text responses from each respondent. Respondents were then asked to include elements that may be missing from the set of domains.

3.5 Protection of Human Subjects

This doctoral project has been determined to be a program evaluation project not subject to Institutional Review Board review or approval. The Delphi Technique via Snowball Sampling did not collect private information or data on individual human subjects. The doctoral student reviewed the purpose of the project, confidentiality statement and asked for permission to include respondent feedback before each REDCap survey was accessed. Respondents were provided the opportunity to decline their participation in the doctoral project at any time and without penalty. All data and information provided by the project respondents remains confidential throughout the project and the final written report. No respondent was identified by name or role. All

data from the project was stored on the doctoral student's password-protected, encrypted personal computer, which will not be accessible by other individuals.

4 CHAPTER IV - RESULTS

4.1 Results and Findings

The purpose of this qualitative research study was to describe how an outpatient group medical practice reengineered operations in response to the COVID-19 pandemic. The following research questions informed this study: *How does one reengineer an allergy group practice in response to COVID-19?* Additional key questions examined during the course of research include:

- What change management criteria should be considered during the process?
- What quality assessments should be delivered during the process?
- What financial considerations should be analyzed during the process?

During in-depth review of the data, administrative documentation, feedback from purposeful sampling, respondent feedback and researcher's observations were utilized to frame recommendations and a checklist in assisting outpatient medical practices as they prepare for and implement changes during future concerning public health events. The Lewin (1947a; 1947b) three-stage change management model (Hussain et al., 2016; Suc et al., 2009; Burnes, 2004) provides a theoretical framework for formulating and executing requisite changes needed to sustain business operations during widespread public health related events. We have determined that an additional, final stage -- simply termed 'assessment' -- should be included while implementing operational changes during significant public health events.

4.2 Case Study Organization Experience

This case study examines the experiences of a national outpatient allergy, asthma and immunology practice headquartered in the southeastern United States. This medical practice is a patient-centered, physician-owned medical group providing services across a twenty-state footprint, which encompasses 135 locations of care. The practice is served by a combined professional medical staff of 175 physicians and advanced practice providers and employs approximately 1,200 staff-level full-time equivalents.

Like many other medical practices, this referenced medical practice substantially transformed operations during the COVID-19 pandemic. Significantly altered daily operations, introduction of telehealth services and enhanced sourcing initiatives were successfully implemented between March 2020 and December 2020 in response to various needs presented during the pandemic. In March 2020, the practice began offering telehealth services for both new patients and established patients presenting with a wide variety of allergy, asthma and immunologic conditions. Providers in this practice completed over 31,000 distinct telehealth encounters in calendar year 2020 compared with a baseline of no telehealth services being offered prior to the COVID-19 pandemic.

4.3 An Adapted Lewin Change Management Process

Generally speaking, the three-stage Lewin (1947a; 1947b) change management model is a useful methodology for use while rapidly deploying requisite and complex changes within the health services organizations (Harrison et al., 2021). This approach is practical and helpful as an organization's culture matches the speed in which urgent change needs to occur (Hechanova et al., 2018; Carter, 2008; Levasseur, 2001). Being

able to quickly adapt to evolving conditions while both implementing change and maintaining operations became the lifeline during the COVID-19 pandemic. During COVID-19 some organizations found that success occurred most rapidly alongside initiated change and avoidance of unintended consequences through the inclusion of a fourth stage, assessment, within the change management cycle.

4.3.1 Stage 1: Unfreeze Existing Processes

Remaining in a state of readiness with dexterity to rapidly implement change is essential when responding to an impending public health event. Continual, proactive organizational communications at all levels of the organization are important to establish a culture that is prepared to pivot during times of crisis and during any change management event. Scenario preparedness and planning that may be encountered by the organization during crisis events and evaluating the organization's response to various scenarios will better prepare any organization while yielding a robust organizational response.

Operational changes often need to occur rapidly and in sequence as health services organizations respond to public health situations. Organizations should unfreeze current operational processes and workflows to enact modifications needed so that organizations are positioned with staff responding to the unfolding situation. Unfreezing current operational workflows may create confusion amongst talent and workgroups; however, actively communicating current workflow modifications prior to implementing the revisions will support the organization's success. This will also assist with addressing staff concerns and alleviating front-line staff's apprehension.

4.3.2 Stage 2: Implement Desired Changes

Once the current operational workflows are unfrozen, planned changes and modifications should occur incrementally while being careful to not overwhelm workforce dynamics alongside rapidly changing public health conditions. Support for change management engagement during rapidly changing public health events should be included within annual staff training programs at all levels of the organization. Soliciting and attaining staff buy-in will assist the organization's response while ensuring broad considerations for the desired changes are cogitated.

Proactive communication strategies meant to engage talent while implementing phased modifications are requisite to the organization's response. Adoption of the requisite changes may require leaders to demonstrate that alternatives were considered before settling on chosen criteria in order to obtain staff buy-in. Business unit leaders should assist with shepherding the operational modifications while ensuring the intended goals are satisfactory -- all while monitoring for unintended consequences.

4.3.3 Stage 3: Refreeze Workflows and Processes

After implementing the change, it is time to refreeze the change management cycle. Operational changes tend to become routine and planted into everyday operational processes as the cycle becomes refrozen. Once again, active communication at all levels of the organization is very important while remaining in tandem with the newly implemented operational processes. This produces new processes that become the standard operating procedure. This is a time to encourage and solicit feedback from all stakeholders while ensuring the intended changes have not yielded unintended consequences. Likewise, it is

an opportunity to document and refine processes such that future modifications can be well planned and implemented.

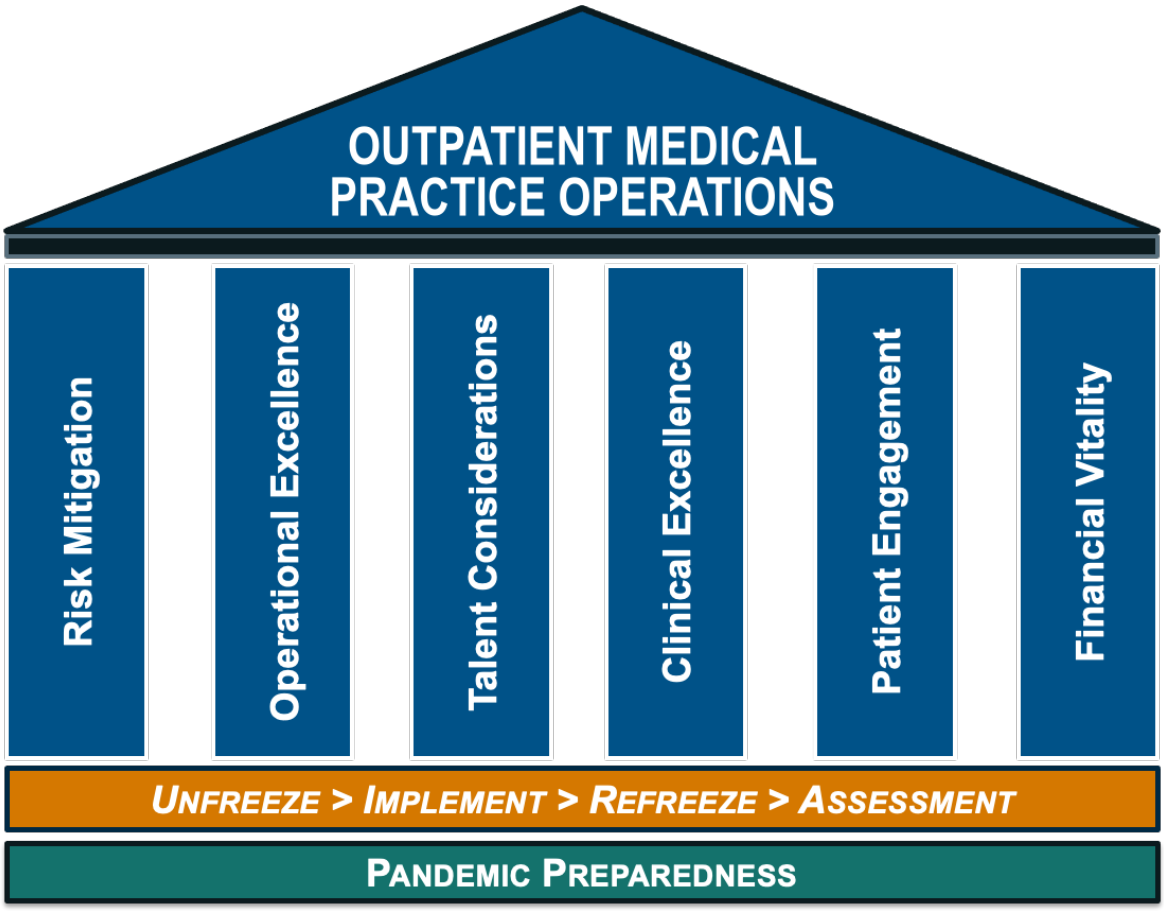
4.3.4 Stage 4: Assess Newly Implemented Workflows and Processes

The fourth stage in this change management cycle becomes the time to evaluate new operational workflows. It assists in determining if modifications are yielding intended results. The phase may be helpful to compare benchmark data prior to the implemented change and after refreezing the change management cycle to determine if the operational modifications are effective and yielding the desired impacts. Continued assessments, evaluation and feedback by staff should be timely as these indicators are important components in assessing for operational success. If additional changes to workflows are needed or if intended consequences produce undesirable results, then the change management cycle may need to be engaged once again. The end result should frame effective operational outcomes during any challenging public health events.

4.4 Outpatient Medical Practice Domains Observed During COVID-19

The COVID-19 global pandemic presented a situation that many health services operational leaders have never experienced. Likewise, at times, outpatient medical practices found themselves scrambling to maintain some sense of normalcy while implementing requisite modifications meant to safely provide health services within the communities that they serve. We observed six domains throughout many medical practices as levers were shifted in an attempt to quickly respond to the evolving public health concerns encountered during the COVID-19 pandemic.

Figure 1: Domains Observed During COVID-19



4.4.1 Domain 1: Risk Mitigation

COVID-19 presented many challenges for outpatient medical offices. The primary focus for most medical practices during the COVID-19 pandemic has been risk mitigation strategies for patients and staff. Medical practices implemented modifications meant to maintain some sense of business normalcy during the public health crisis. Many organizational business interruption strategies that were implemented early during the pandemic were subsequently modified as events unfolded since March 2020.

The focus on protecting patients and staff from community viral spread have been

at the forefront for outpatient medical offices. Reducing provider schedules and patient appointment slot availability to account for state and local occupancy limitations were considered very early as a risk mitigation technique. With COVID-19, public health officials shifted recommendations and guidance as more knowledge was gained about the virus.

Implementing office building occupancy reductions while enhancing environmental sanitation efforts leads to a safer environment for all individuals interfacing with multiple patients in a scheduled day. These changes may necessitate adjustments to processes or workflows. Clinics should communicate intended changes to staff during annual workforce training programs. Annual preparedness drills may assist with staff awareness training so that contingency plan adjustments are adequately addressed in anticipation of future public health situations and to engage a quick response. Organizations that prepare for and remain in a constant readiness state tend to be more agile in their response to changing public health requirements.

Other opportunities to prepare for the next public health situation include routine building ventilation (HVAC) filtration system installation, maintenance and testing. This should include the ability to rapidly deploy enhanced air filtration and room air cleaning systems that target very small viral particles. Portable systems may be considered for medical offices physically located in older buildings where the installation and maintenance of enhanced ventilation systems may be cost prohibitive.

4.4.2 Domain 2: Operational Excellence

During the COVID-19 pandemic, many outpatient medical practices were ill-prepared for globally tightening supply chain markets. The worldwide demand for

personal protective equipment, medical supplies and sanitation paper products (paper towels, toilet tissue, disinfectant wipes, etc.) became scarce and very expensive. Daily operations were severely impacted due to supply constraints. Essentially, demand for these products was much greater than the manufacturing supply sources. In turn, many consumable resource suppliers placed specific products on allocation lists. This required organizations to have a historical purchasing history with each specific supplier in order to source categories of supplies from the respective suppliers.

Outpatient medical offices should consider diversifying medical supply vendors. This will enable various allocation priorities with multiple vendors in the future. Establishing a sourcing history with more than one group purchasing organization may assist when supply chains become more restrictive during public health events. Additionally, medical offices that maintain a minimal par-stock inventory for PPE and cleaning supplies fared better as COVID-19 supplies were limited. Considerations for establishing and rotating a base 12-week supply inventory for items such as PPE, sanitization cleaning supplies and paper products will be helpful in preparing for future pandemic conditions.

Medical practices that perform aerosolizing procedures were negatively impacted during COVID-19. Centers for Disease Control and Prevention (CDC) (2020a; 2020b) recommendations necessitated a reduction (and in many cases discontinuation) of procedures that created increased aerosolized droplets within the office setting (Bolton et al., 2020). For instance, allergy and asthma medical offices eliminated spirometry and pulmonary function testing due to elevated levels of droplets produced during patient testing. Some of these offices installed microparticle air filtration devices along with

negative pressure rooms such that patient testing could continue. Installation of these testing environments within existing physical spaces enabled medical practices to continue to provide patient care (de Bernardi et al., 2020; de Caro et al., 2020). At the same time, these engineering controls supported patient and staff safety while mitigating risks for COVID-19 transmission from potentially asymptomatic patients.

Telehealth is another factor that became widely accepted during the COVID-19 public health event. Prior to March 2020, relatively few independent medical practices had adopted telehealth as an acceptable means for providing routine medical patient care. Telehealth office visits became standardized as the prolonged COVID-19 pandemic period grew. Many medical offices were thrust into survival mode and challenged with caring for patients in ways not traditionally embraced. Telehealth adoption soared as patients' needs for health services persisted over the course of the pandemic (Mehrotra et al., 2021).

Operational workflow changes may be required during public health events. Some states and municipalities issued executive orders requiring businesses to reduce occupancy during the COVID-19 pandemic. These orders were issued to reduce opportunities for COVID-19 transmission and community spread within indoor settings. Outpatient medical practices responded by adjusting clinic visits and testing schedules, which allowed offices to improve occupancy during peak clinic times. The modifications required medical offices to adjust existing workflows, including overall patient throughput, patient registration, waiting room sanitation and exam room cleaning. Some offices revamped entire workflows by creating virtual online waiting rooms and implemented parking lot patient check-in procedures to reduce the number of patients at the front desk or congregating in waiting rooms at a given time.

Preparing for and considering possible workflow modifications should be an essential element while developing a medical practice response plan. Of importance, recognizing that established workflows may need to be significantly altered when responding to public health events within a medical office is essential to know from the outset. Collaboration involving clinical and administrative support staff while developing contingency plans will make the medical practice more functional while responding to pandemic conditions.

4.4.3 Domain 3: Talent Considerations

Keeping medical practice staff and providers engaged over a protracted duration in a public health event is challenging. Repetitive workflow changes necessitated by health and safety conditions presented during a pandemic may significantly impact staff and provider morale. Required use of PPE during the entire work day -- when not normally worn -- all day, every day can be exhausting to both physical and emotional well-being.

Maintaining resiliency during periods of repetitive change will likely be more successful if the ongoing culture established prior to the public health event is more inclusive. Consistent collaborative efforts that involve staff and providers in process redesign is important for normal, routine medical office operations. This becomes even more essential during stressful periods involving multiple workflow changes designed to protect patient and staff health and safety, while improving social distancing and enhancing sanitation efforts during a pandemic.

During COVID-19, many medical practices provided resiliency services to support providers and staff during the extended public health emergency. These efforts included

complementary boxed meals, virtual happy hour social events, extended personal breaks and other nominal gifts such as chair massages, cosmetic services and refreshments. Medical practices with baseline resiliency programs prior to COVID-19 enhanced the frequency and variety of staff morale boosters in an attempt to mute stressors experienced during the long-term impact of COVID-19.

4.4.4 Domain 4: Clinical Excellence

Health services organizations place patient care at the center of the medical care paradigm. Focused efforts providing the highest quality and convenient healthcare services is just a good, sound business philosophy within the industry. As previously mentioned, long-term public health challenges require workflow changes in medical practices. Deviating from a baseline standard of care isn't an option despite challenging public health conditions. This is especially true during periods requiring rapid changes that may impact patient care.

Outpatient medical practices maintain adequate, daily sanitation and cleaning routines. Medical offices should consider enhanced cleaning protocols during significant public health events. To decrease the opportunity for community spread within the medical office, thorough patient examination room sanitation standards need to be established between patients. After the patient's departure, all exposed surfaces within the exam room should be sanitized with medical-grade disinfectant that is approved to kill a variety of pathogens. After disinfecting, the surfaces should be allowed to air dry for the disinfectant to completely eliminate pathogens. Additionally, medical offices will need to regularly sanitize patient furniture, door handles and other high-traffic occupancy areas on

a routine basis throughout the day.

These enhanced cleaning protocols require adequate spacing between each patient's departure and when the next patient is escorted to the exam room. Reduction in provider templated schedules may need to be considered in order to effectively clean and sanitize after each patient. Initially, during the COVID-19 pandemic, some medical offices reduced in-person patient visits by 100% and relied on telehealth services. Other medical offices reduced the number of patients seen each day by 25% to 50% to limit patient flow while maintaining adequate time for newly implemented sanitation protocols.

The supply chain constraints experienced during the COVID-19 pandemic required medical practices to be innovative while ensuring adequate sanitation techniques were utilized. Medical offices accustomed to using pre-mixed commercial grade disinfectant and/or pre-moistened sanitation products (i.e. wipes) were forced to transition to a simple diluted bleach solution and cloth towels. This shift occurred due to increased demand for disinfectants typically available and manufacturer slowdowns as a result of COVID-19 repercussions throughout most global business operations.

The CDC along with many state and local health departments encouraged enhanced hand hygiene campaigns during the COVID-19 pandemic. Medical offices with hand hygiene reminder programs prior to the pandemic became more successful in helping to promote hand hygiene, masking and social distancing through active patient communication and education efforts. Additionally, medical offices have improved access to alcohol-based hand sanitizer options -- located throughout high patient throughput areas -- once the products became more plentiful and easier to source.

Further, the CDC also recommended consistent uses of face coverings during the

COVID-19 pandemic. Masking in public indoor settings is a simple method to reduce community spread opportunities for COVID-19. Nationally, health services organizations implemented requirements that mandate face coverings to be worn by all patients, staff and providers. In response, most outpatient medical practices have required face masks or coverings for anyone entering the office. During the pandemic, medical offices became the educational foundation in demonstrating that masking is a simple action that patients should adopt to reduce disease transmission while protecting themselves and their families.

For many medical practices, status quo clinical excellence safety implements remain the strongest opportunity for protecting the health and safety of patients and staff during the COVID-19 pandemic. Refusing to deviate from this philosophy demonstrates the commitment to the medical practice's patients. Recognizing that patients' trust in the delivery of quality care doesn't dissipate during public health events is essential. However, reinventing the delivery manner in which quality care is provided becomes increasingly important so that services may continue to be provided to patients seeking medical care.

Outpatient medical practices struggled to source consumable supplies necessary to maintain safe environments for patients and staff during the early phases of the COVID-19 pandemic. Medical offices with agile leaders tirelessly found new ways to source requisite resources so that staff and providers could continue providing high quality clinical services that patients require and expect. Professional medical group organizations formed partnerships to source and disperse bulk supplies and products.

Those offices with strong staff communication plans prior to the COVID-19 pandemic found that adoption of new clinical excellence models was more widely accepted

and implementation occurred quickly. Success tends to occur more rapidly when staff are given the opportunity to provide feedback and re-design workflows that impact them directly. This is a key take-away and important for reengineering medical practices during future public health events.

4.4.5 Domain 5: Patient Engagement

Employing new technologies to keep patients engaged with their treatment plans while maintaining overall physical and psychological well-being are important within today's health services environment. The COVID-19 pandemic created multi-pronged challenges in this domain. Many medical practices significantly reduced templated provider schedules to account for social distancing and increased cleaning requirements. This lowered daily appointment slot availability and increased the time before patients could obtain an appointment for chronic disease management and/or newly acquired conditions.

Establishing an active patient communication strategy is important in relaying essential health information to patients in a timely manner. Some outpatient medical offices rely on patient portals to communicate information to patients. Other medical offices rely on mass email notifications. During the COVID-19 pandemic, perhaps the quickest and most effective communication method was simple one-way texting capabilities with patients. Utilizing a simple mass communication and texting service offers several advantages and may direct patients to more specific information found on the medical practice's webpage, patient portal or other social media outlet.

As the pandemic continued, many medical practices implemented other methods to

communicate office closures. Other practices used proactive communication strategies to establish expectations for patients and their families visiting the office for the first time since the public health risk mitigation strategies were implemented. Other medical offices implemented parking lot check-in workflows. Examples of these patient conveniences enable patients to communicate in a secure two-way texting format with administrative and clinical support. Not only does this allow for engagement with the patient, but it also enables the medical office to control the flow of patients into the building. Allowing patients to wait for their appointment in their vehicle is useful in preventing waiting room mass congregating. These efforts also support initiatives to decrease building occupancy and increase social distancing. Additionally, these engagement activities reduce the opportunity for community disease spread in smaller, confined areas within the medical office.

Some technology companies refined their strategies to support changing trends while promoting virtual health related services during the COVID-19 pandemic. Aligning medical office goals alongside the technologies currently available and facilitating discussions with vendor partners enables providers and staff to remain engaged with their patient populations. Telehealth services have expanded rapidly over the last two years; however, multispecialty telehealth adoption became widely accepted during the COVID-19 pandemic. Established partnerships with technology vendors yielded further refinements in patient care. The method in which medical care -- as a service industry -- is provided looks different as a result of outpatient medical offices joining forces with technology vendors during the pandemic.

4.4.6 Domain 6: Financial Vitality

The overall success of most business entities hinges on the financial vitality of the economic unit. Those organizations experiencing financial success most often have some stability within their everyday operations. Likewise, those organizations that struggle financially do so after experiencing rapid shifts in volumes or other pressures that result in the need to swiftly change directions or significantly alter operations to stay afloat. This may be attributable to lower throughput, decreased revenue, increased supply costs, inflated talent expense and/or a combination of several of these factors.

Like most industries and niche businesses, outpatient medical practices were not immune to the economic downturn experienced during the COVID-19 pandemic. In order to be socially responsible, medical offices significantly reduced services during the early phases of the pandemic. In doing so, most medical offices were faced with a talent pool without any work. Some medical practices chose to furlough non-essential staff so those individuals could access federal and state unemployment benefits. Concurrently, many medical practices implemented and increased virtual and telehealth services so that a revenue stream -- although reduced -- could be salvaged while attempting to provide much needed access to care for their patient populations.

The federal government and many state governments also responded to the public health event by quickly enacting economic stimulus legislation. These economic relief efforts were attempts to support and encourage employers to return employees from furlough while reimbursing the employer for salaries and wages paid during the economic downturn. Additionally, government agencies began to issue grant funding for independent medical practices that required renovations to safely provide medical care

during the COVID-19 pandemic (Mohammad et al., 2020). Some state government agencies provided economic assistance and reimbursement for COVID-19 related medical supplies that were sourced -- at premium acquisition costs -- in order to maintain baseline levels of clinical operations and patient services during the pandemic.

Finally, outpatient medical offices that strategically recognized the manner in which health services would be provided after the COVID-19 pandemic were most successful in muting economic distress. Acknowledging that the status quo of providing outpatient medical services post-COVID-19 would be forever changed as a result of the pandemic is important for coordinating ongoing operations during future public health events. A sound, strategic operational plan that includes a multi-faceted approach for delivering high quality patient services is essential for riding the wave of uncertainty during a public health event. Those agile medical practices with the forethought of revolutionizing health services have been most successful. We have seen these financial gains further realized as we radically redesigned the care paradigm while continuing to provide health services in an approach that remains patient centric and aligns with our financial vitality.

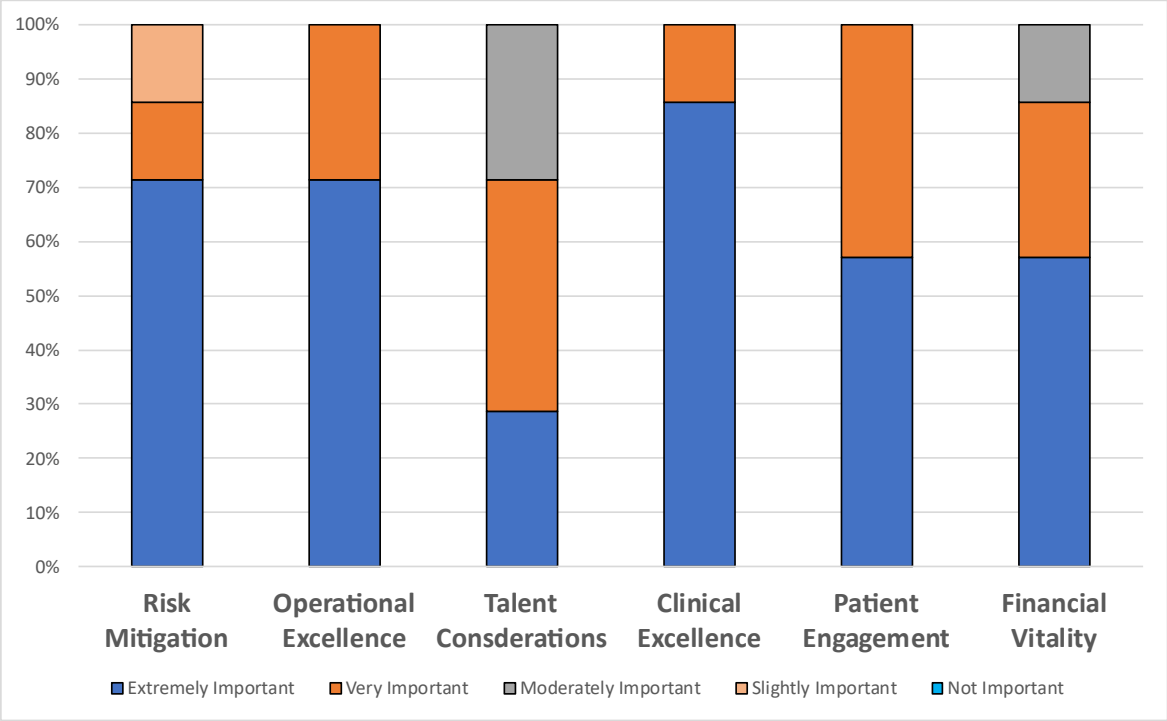
4.5 Lessons Learned

The trials that outpatient medical practices experienced during the COVID-19 pandemic were most unlike anything that the current working generation has ever experienced. All of the challenges experienced during the pandemic may not have been fully avoided. However, a more seamless preparation and planning process would have likely assisted medical practice leaders as they responded to challenges in rapid sequence

during the pandemic. A detailed and careful examination of each office's operational workflows and standard operating procedures today will assist in better preparing leaders to reengineer their outpatient medical practice during the next public health event.

4.6 Delphi Results

Figure 2: Respondent Ranking of Domains



The expert reviewers all scored the proposed domains as important in pandemic preparedness programming. The strongest agreement was within the Clinical Excellence domain, where 85.7% of the experts rated the domain as extremely important and 14.3% rated the domain as very important. The next highest level of agreement was in the Operational Excellence domain, with 71.4% of the experts indicating the domain was extremely important and 28.6% ranking the domain as very important. The level of agreement for the Patient Engagement domain was more closely split, with 57.1% of the

experts rating the domain as extremely important and 42.9% ranking the domain as very important.

The most mixed results were within the Talent Considerations domain, where responses were more evenly distributed, with 42.9% of the experts rating the domain as very important while 28.6% rated the domain either extremely important and moderately important. Likewise, the Financial Vitality domain received mixed ratings, with 57.1% ranking the domain as extremely important, 28.6% rating very important and 14.3% rating the domain as moderately important. Finally, the Risk Mitigation domain also received mixed ratings, with 71.4% rating the domain as extremely important, 14.% rating very important and 14.3% rating the domain as slightly important.

Only one expert provided additional suggestions to consider in our framework. This respondent suggested “steps to effectively reopen” to be added as an area to address in pandemic preparedness programming.

5 CHAPTER V - DISCUSSION

5.1 Discussion of Results

Collectively, the six domains identified in our single, descriptive case study research are essential for future pandemic preparedness efforts in outpatient medical practices. Unfortunately, medical practices were ill-prepared for adequate ongoing business operations and contingencies as a result of the COVID-19 pandemic conditions. Many of the identified domains have been discussed, in parts and among different healthcare settings, within the literature; however, we are unable to locate a collective set of specific categories adequately addressing the considerations within the outpatient medical office context. As a result, outpatient medical offices were challenged with multi-faceted trials involving consumable supply acquisition constraints, business operations reductions, workforce challenges and significant financial disruptions.

We utilized a Delphi method of consensus, which was completed via snowball sampling to determine if our findings are succinctly consistent with the experiences at other outpatient medical practices within the United States during the COVID-19 pandemic (Appendix A). The Delphi consensus model is considered an acceptable method to reach agreement and evaluate findings amongst a panel of experts (Vogel et al., 2019; Crane et al., 2017; Akins et al., 2005; Cook et al., 2001). Our consensus review was completed by a diverse set of experts thought to have knowledge pertaining to outpatient medical practice operations. This group of experts was comprised of private practice physicians, practice administrators and emergency preparedness coordinators.

The panel of experts rated the Operational Excellence, Clinical Excellence, Patient Engagement and Financial Vitality domains within our model as extremely important or very important for outpatient medical practices to actively consider during pandemic preparedness programming. The Risk Mitigation and Talent Considerations domains were also rated extremely important and very important, but expert consensus varied slightly to include moderately important ratings.

Given the consistency among the experts' ratings, outpatient medical practices should embark on a journey to develop preparedness and contingency plans to support ongoing operations during future pandemic events. Lack of awareness, preparedness, education and complacency likely contributed to disruptions in health services for patients and their families during the COVID-19 pandemic. Maintaining an ongoing state of readiness through consistent pandemic preparedness activities today will better leverage the identified domains to be quickly engaged as organizations respond during the next pandemic.

5.2 Limitations

The findings from this single case study provide valuable information for outpatient medical practice leaders to consider when developing and reviewing pandemic preparedness plans. However, two important limitations should be considered that affect the generalizability of the findings. First, the data reviewed in this qualitative inquiry was based on information ascertained solely during the COVID-19 pandemic and may not be applicable to smaller scale or less contagious pandemics that do not impact significant business operations or only affect specific industries. The globally-impacting COVID-19

pandemic presented a unique situation unknown to many adults currently in the workforce. A smaller-scale regional outbreak may present different sets of challenges that require appropriate planning and interventions.

Second, the patterns we observed in this case study during COVID-19 may not be representative of all medical and surgical specialties that provide outpatient health services. The experiences described within this case study are presented from an outpatient specialty medical practice perspective. Actual business operations impacting other specialties may present another set of challenges and interventions that may require additional pandemic preparedness activities.

5.3 Future Research

A void remains in the literature pertaining to effective operational strategies for outpatient medical practices in supporting and maintaining business continuity due to many other uncontrollable factors. Future research detailing comprehensive matrices that provision continuing medical practice operations during separate or compounded events will be beneficial in enhancing the knowledge base. Stratifying the various needs based on financial and operational requirements are necessary for minimizing the grounded impact of external forces on routine medical practice operations.

5.4 Conclusions

Outpatient medical practices will be continually faced with developing much needed pandemic contingency plans for ongoing operations as they emerge from the COVID-19 pandemic. The six domains that we identified through this case study is

supported by the current knowledge base and actual lived experience. This framework will provide an outline for medical practices to be better prepared in handling future pandemic conditions. It is essential for all outpatient medical offices to take the requisite time in developing preparation and educational programs that support adequate patient care during the next pandemic. As pandemic preparedness programming is developed, ensuring that readiness drills occur regularly will support staff adoption and overall practice operations while safeguarding patients care is adequately provided, if and when, the next pandemic occurs.

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Appendices

Appendix A

Appendix A

Reengineering an allergy group practice in response to COVID 19

REENGINEERING AN ALLERGY GROUP PRACTICE IN RESPONSE TO COVID-19:

Change Management, Quality Assessment and Financial Considerations

The attached electronic questionnaire is part of a Doctoral Project at the Medical University of South Carolina.

The purpose of this exploration is to reach a consensus and gather information pertaining to the domains necessary for outpatient medical practices to consider in pandemic preparedness.

As a medical practice administrator, physician or emergency preparedness coordinator, we would like your opinion on the essential domains for medical practices to consider when evaluating pandemic preparedness.

Thank you for helping to improve outpatient medical practice pandemic preparedness programming!

Please complete the survey below.

Please review the attached domain definitions and consider their level of importance for outpatient medical practice pandemic preparedness programming. Then using this information, please rate the level of importance of each domain below.

Attachment: Pandemic Preparedness Definitions.pdf (0.07 MB)

Please rate the level of importance for outpatient medical practice pandemic preparedness programming:

	Not Important	Slightly Important	Moderately Important	Very Important	Extremely Important
Risk Mitigation	○	○	○	○	○ reset
Operational Excellence	○	○	○	○	○ reset
Talent Considerations	○	○	○	○	○ reset
Clinical Excellence	○	○	○	○	○ reset
Patient Engagement	○	○	○	○	○ reset
Financial Vitality	○	○	○	○	○ reset

Are there other relevant considerations that outpatient medical practices should consider when addressing pandemic preparedness programming?

○ Yes
○ No

reset

Are there general comments or ideas that have not been covered for outpatient medical practices when addressing pandemic preparedness programming?

○ Yes
○ No

reset

Additional Respondent Sampling Requested
Please provide the name, position and email address of 1-2 other professional colleagues (Practice Administrator, Physician or Emergency Preparedness Coordinator) who may be willing to participate in this same survey.

Expand

Submit

Appendix B

Appendix B

REENGINEERING AN ALLERGY GROUP PRACTICE IN RESPONSE TO COVID-19

Please review the following domain definitions and consider their level of importance for outpatient medical practice pandemic preparedness programming:

Domain: Risk Mitigation

How important are risk mitigation strategies for outpatient medical practices in pandemic preparedness programming? Risk mitigation strategies may include, but are not limited to:

Creating disaster planning programs - readiness drills - reviewed consistently	Updating personal protective equipment - in-stock - inclusive of a three-month supply burn rate
Securing disinfectant and cleaning supplies	Creating paper products inventory
Ordering hand hygiene supplies	Promoting social distancing
Installing protective screens	Maintaining heating and air (HVAC) systems
Developing contingency plans	Implementing staff communication plans

Domain: Operational Excellence

How important are operational excellence strategies for outpatient medical practices in pandemic preparedness programming? Operational excellence strategies may include, but are not limited to:

Maintaining disaster planning programs	Creating paper products inventory
Sourcing personal protective equipment	Ordering hand hygiene supplies
Securing disinfectant and cleaning supplies	Providing on-going staff education

Domain: Talent Considerations

How important are talent considerations for outpatient medical practices in pandemic preparedness programming? Talent considerations may include, but are not limited to:

Developing staff education programs	Adopting change management staff training
Creating resiliency efforts	Locating childcare resources for staff
Updating current staff contingency plans	Providing psycho-social support resources

Domain: Clinical Excellence

How important are clinical excellence strategies for outpatient medical practices in pandemic preparedness programming? Clinical excellence strategies may include, but are not limited to:

Maintaining appropriate standards of care	Communicating with referral sources
Ensuring patient safety	Establishing reliable patient communications

Domain: Patient Engagement

How important are patient engagement efforts for outpatient medical practices in pandemic preparedness programming? Patient engagement efforts may include, but are not limited to:

Keeping patient informed	Ensuring patient safety
Messaging to patients regarding expectations	Addressing patient communication methods

Domain: Financial Vitality

How important are financial vitality strategies for outpatient medical practices in pandemic preparedness programming? Financial vitality strategies may include, but are not limited to:

Establishing positive cash flow	Reviewing economic relief grant opportunities