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Development and Implementation of an Emergency Preparedness Policy and Procedure, Educational Intervention, and In-situ Simulation in a Pediatric Primary Care Office: A Quality Improvement Project

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Submitted in Partial Fulfillment of the Requirements for the Doctor of Nursing Practice Degree

Project Committee

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Abstract

Background. Pediatric primary care offices are frequently unprepared to respond to clinical emergencies that may present to or occur at their site. The purpose of this project was to improve office emergency preparedness at a pediatric primary care office to align with the American Academy of Pediatrics policy statement for pediatric office emergency preparedness.

Methods.
A PRISMA-guided literature review found support for both educational interventions and in-situ simulation to improve aspects of emergency preparedness. The aim of this project was to develop a practice-specific emergency preparedness policy and procedure and implement a training and in-situ simulation to increase medical and non-medical staff knowledge and comfort in managing emergencies. The availability of equipment and policy components were measured pre- and post-intervention. Other measures included rates of completion of CPR certification, office-based video training, and rates of attendance at an in-situ simulation. A post-intervention survey evaluated staff perception of impacts of the training and simulation.

Intervention. The intervention in this project was multi-step and included the development and implementation of a novel office-specific policy, the development and dissemination of an asynchronous video training on office emergency response, and the implementation of an in-situ simulation, which was followed by a debriefing and post-implementation survey.

Results. An office-specific policy and procedure was created and implemented. At the close of the project, 94% of necessary emergency equipment was obtained and strategically stocked; 88% of staff were CPR certified and completed the asynchronous video training; 65% of staff attended the in-situ simulation and participated in the post-implementation survey. The availability of emergency items increased by 55%. The post-implementation survey yielded affirmative responses signaling improvement in all areas considered.

Conclusion. This project describes a multi-step intervention that resulted in improvement in office emergency preparedness and increased staff knowledge, skills, and comfort in responding to an in-office emergency. This project offers a framework for a feasible, sustainable, and cost-effective quality improvement intervention that could be utilized by pediatric primary care offices to improve office emergency preparedness in alignment with the American Academy of Pediatrics policy statement.

Development and Implementation of an Emergency Preparedness Policy and Procedure, Educational Intervention, and In-situ Simulation in a Pediatric Primary Care Office: A Quality Improvement Project

Introduction

Problem Description

Despite their clinical condition necessitating a higher level of care, children experiencing medical emergencies occasionally present to pediatric primary care practices instead of the emergency room. Likewise, children presenting to the pediatric office with conditions like asthma, dehydration, or croup, can experience rapid clinical deterioration requiring emergency management (Milla et al., 2023). One study defined pediatric office emergency preparedness as "the ability to provide high-quality care to children who have life-threatening illnesses or injuries before being transferred to an emergency department" (Abulebda et al., 2021, p. 66). Pediatric primary care providers and staff need to be prepared to respond to such emergencies. In 2007, the American Academy of Pediatrics [AAP] issued a Policy Statement entitled "Preparation for Emergencies in the Offices of Pediatricians and Pediatric Primary Care Providers" that outlined recommendations on how to best ensure each pediatric primary office is prepared to respond to emergencies including recommendations on staff training, office policies, equipment, and medications that should be available on-site. Despite the reaffirmation of this policy statement in 2018, studies show that outpatient pediatric primary care offices remain unprepared to respond to and manage clinical pediatric emergencies (Abulebda et al., 2021; Pendleton & Stevenson, 2015).

A recent study that sought to determine the frequency and characteristics of pediatric emergencies presenting to outpatient ambulatory care centers in an urban city found that, on average, there were 42 pediatric emergencies per 100,000 people per year; most facilities that were studied saw less than 2 emergencies per year and most of these emergencies did not require

critical care interventions (Yuknis et al., 2018). Yuknis et al. (2018) concluded that because of the infrequency of these emergencies, providers and their support staff will likely struggle to maintain the skills, policies, and procedures that are required to manage critically ill patients through exposure to these situations.

Findings from multiple studies have highlighted the prevalence of the lack of preparedness at pediatric primary care offices around the United States (Abulebda et al., 2021; Pendleton & Stevenson, 2015). Abulebda et al.'s (2021) observational study measured adherence to the AAP Policy Statement using an in-person survey within 42 pediatric primary care offices over 9 different states and found a mean emergency preparedness score of 74.2% out of a possible 100. In addition, the median essential equipment supply score was 82.2%, with infant bag valve masks (18%), cardiac arrests boards (43%), and oral airways (47%) being the least available items (Abulebda et al., 2021). In measurements of performance during in-situ simulation for asthma and seizure emergencies, median performance scores were 63.6% and 69.2% respectively (Abulebda, 2021). A 2015 survey of 57 outpatient physicians found that only 65% of pediatricians reported current basic life support training [BLS] training and only 21% reported pediatric advanced life support training [PALS] training (Pendleton & Stevenson, 2015). The same study found that only 53% of the physicians surveyed were aware of the 2007 AAP Policy statement regarding preparedness in pediatric primary care offices (Pendleton & Stevenson, 2015). Furthermore, only 23% of respondents were both aware of the policy and felt that their office was compliant with the policy's guidelines (Pendleton & Stevenson, 2015).

Local Problem

The local problem at this private pediatric primary care practice was lack of preparedness for clinical emergencies. The office did not have a formal policy and procedure for maintaining

office preparedness or responding to clinical emergencies. The office was lacking an established policy and procedure for emergency preparedness and response as well as lacking emergency medical equipment and staff training opportunities to practice responding to medical emergencies. This lack of emergency preparedness left patients that presented to the office with medical emergencies vulnerable to harm that may have resulted from errors made during the stabilization process or delays in the activation of Emergency Medical Services (Abulebda et al., 2021). The AAP (2007) Policy Statement notes that the care provided during the first minutes of an emergency can have a great effect on a child's long-term outcome. A lack of emergency preparedness may also leave providers open to increased liability (AAP, 2007; AAP, 2019). For instance, Pendleton and Stevenson (2015) found that 87% of physicians at sites with intubation equipment did not have current Pediatric Advanced Life Support certification, leaving them at risk for potential incorrect use of equipment.

Available Knowledge

A PRISMA-guided review of the literature was undertaken to examine the most effective strategies to improve clinical emergency preparedness for all staff within pediatric primary care practices. Seven studies were identified and reviewed during this literature review: six studies were quantitative, including one randomized controlled trial and five quasi-experimental studies; one study was qualitative. Characteristics and findings of these studies are synthesized in the Evidence Synthesis Table in Appendix A. The reported number of participants in each study varied. Among studies that reported the number of practices as participants, between eight and 39 pediatric primary care practices were included. Among studies that reported the number of participants, between 143 and 229 providers and office staff participated in the studies. All the studies included looked specifically at offices that provided primary care to pediatric patients in

various locations including North Carolina, central Florida, Texas, and Pennsylvania; all studies were conducted within the United States although three did not clearly report their study location.

In terms of the interventions that were studied to improve office emergency preparedness: three of the seven studies looked at improving emergency preparedness through in-situ simulation, which can also be termed "mock-code," within the office setting (Bordley et al., 2003; Garrow, et al., 2020; Kalidindi et al., 2018;). Three studies looked at the effects of an in-situ-simulation combined with an educational intervention, in the form of either in person-training or didactic program (Toback et al., 2006; Shenoi et al., 2013; Spanos, 2022). Yuknis et al. (2022) created practice-specific opportunity assessments and provided a toolkit and ongoing support to offices to improve their emergency preparedness scores; they utilized pre- and post-intervention preparedness checklists and in-situ simulation scores to measure improvement.

In-situ simulation within the office setting was the most well supported intervention in this literature review. Bordley et al. (2003) found that practices that participated in in-situ simulation, in the form of an "unannounced mock-code," were more likely than the control group to develop written office emergency protocols and receive additional BLS, PALS, APLS (the pediatric emergency medicine course), or ACLS training within the 3-6 months following the intervention. Garrow et al. (2020) found that in-situ simulation allowed the offices to explore emergency preparedness and areas of knowledge deficit, as well as to identify and address latent safety threats. Yuknis et al. (2022), also, identified latent safety threats during their simulation sessions that were then reviewed with the participating offices. An earlier study (Kalidindi et al., 2018), likewise, concluded that simulation training can expose weaknesses in a practice's ability to handle an emergency and, further, that primary care staff members reported significantly

enhanced preparedness in managing emergencies ($p < 0.05$) and higher levels of confidence in managing emergency situations after in-situ simulation training ($p < 0.05$). In Kalidindi et al. (2018), primary care providers did not report enhanced preparedness in managing emergencies post-simulation but overall, all of the simulation participants (office staff and providers), felt that the simulation was effective. On a six-month follow up survey, confidence levels in office preparedness and managing emergencies were maintained and staff also reported the ability to easily locate oxygen-administration equipment because of the post-simulation discussion (Kalidindi et al., 2018).

Positive outcomes were also seen in the studies that looked at a combination of education, in the form of didactic lecture, and in-situ simulation. Shenoi et al. (2013) conducted an education program that consisted of both an in-person didactic lecture and two mock codes. Shenoi et al. (2013) found that their educational intervention resulted in statistically significant improvement in knowledge scores among physicians ($p < .002$), although nurses had a smaller, statistically nonsignificant ($p = .13$) improvement. Both physicians ($p < .002$) and nurses ($p < .004$) had statistically significant improvement in comfort levels in managing emergency situations (Shenoi et al., 2013). Interestingly, Shenoi et al., (2013) also found that the post-test knowledge scores for physicians were not sustained after a three-year period. On a three-year follow up survey physicians had 80% correct answers, compared to 91% on the post-test immediately following the educational intervention and 79% of correct answers on a pre-intervention baseline test (Shenoi et al., 2013). Shenoi et al.'s (2013) findings highlight the importance of regular education within the office to maintain knowledge levels, although from this study it remains unclear the optimal frequency of education. Toback et al. (2006) also utilized an education as an intervention in combination with in-situ simulation in their study that

included all staff members (medical and non-medical staff) within 11 different pediatric primary care practices. The education portion of their intervention was a 1-hour didactic training for staff that included education on "office emergency protocols, emergency equipment and medications, and guidelines on instituting a mock code program" (Toback et al., 2006). Toback et al. (2006) found their combination educational intervention resulted in statistically significant ($p = .008$ or less for all survey questions) increases in general confidence and comfort during medical emergencies among the 164 physicians and staff that participated. Likewise, 83% of all participants and 96% of physicians reported that participating in the mock-code led to decreased levels of anxiety about medical emergencies (Toback et al., 2006). In Spanos's (2022) qualitative study of a combination in-person training and in-situ simulation, issues with medications, equipment, teamwork dynamics, and pediatric emergency resuscitation were revealed through thematic analysis and office staff felt more prepared to handle emergencies after the training.

The most promising strategy for increasing office emergency preparedness at this site was a multi-step intervention that includes both a combination all-staff training and in-situ simulation.

A review was undertaken to determine the most effective strategies for conducting interprofessional adult learning within the ambulatory care setting. The World Health Organization defines interprofessional education (IPE) as "when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes" (World Health Organization, 2010, p.7). The Association for Nursing Professional Development note that interprofessional continuing education (IPCE) requires interprofessional planning for and evaluation of education activities for groups of learners (Moyer and Shinners, 2017). Moyer and Shinners (2017) also note that the practice models

within ambulatory care settings are rapidly changing from that of a physician-driven model to a team-based system where collaboration and standardized work allow for “proactive, patient-centered care” (p.390). As the ambulatory-care practice model evolves, IPCE may be a key strategy to prepare or “catch-up” to gaps in the newly evolving care models (Moyer & Shinners, 2017, p.390). Notably, the literature regarding adult interprofessional learning strategies within the ambulatory or primary care setting is limited. Therefore, this search reviewed articles that included relevant topics of interprofessional learning in healthcare, asynchronous online learning, and synchronous online learning for nurses, physicians, healthcare professional students, and interprofessional teams.

Three quantitative studies were reviewed (Raffoul et al., 2022; Suppan et al., 2021; Suliman et al., 2022). One randomized control trial studied the effect of an asynchronous online video training amongst primary care physicians (Raffoul et al., 2022). Another randomized controlled trial compared the learning outcomes of asynchronous e-learning modules to a traditional asynchronous didactic video training (Suppan, 2021). Suliman et al.’s (2022) randomized controlled trial examined the outcomes of online synchronous classes versus asynchronous classes on nursing students’ knowledge. One qualitative study examined virtual asynchronous learning modules in interprofessional education for healthcare professional students (Grace et al., 2023).

Asynchronous Online Learning

Grace et al. (2023) conducted a qualitative study to explore the advantages and disadvantage of virtual, asynchronous modules used in interprofessional education (IPE). Participants of Grace et al.’s (2023) study were healthcare students from different healthcare professional disciplines including nursing students, medical students, and physician assistants. A

main advantage to virtual, asynchronous learning is that it does not require a dedicated physical space or specific time from a learner's schedule, which are both barriers to in-person, synchronous learning methods (Grace et al., 2023). Virtual, asynchronous learning has the added benefit that learners can access the education at their desired time and in their preferred environment, adding an element of convenience and the ability for learners to internalize information at their own pace (Grace et al., 2023). In Grace et al.'s study, learners reported that the asynchronous quality of their learning contributed to a sense of psychological safety in the sense that their modules served as a reminder that it is safe to ask questions, where initially they felt it was more difficult to ask questions during a face-to-face clinical situation.

There are various types of asynchronous online learning including video modules and interactive e-learning modules. Raffoul et al. (2022) found that asynchronous training using a one-hour video recording of a live webinar significantly improved ($p < .05$) primary care providers knowledge about material related to eating disorders. The video recording also improved participants level of comfort in screening and making referrals regarding eating disorders ($p < .05$). Suppan et al. (2021) found that a highly interactive e-learning module that used interactive content and gamified modules to promote engagement of learners led to improved knowledge scores ($p < .001$) on a post-training quiz compared to participants who participated in a video training.

Potential disadvantages that were ascribed to virtual, asynchronous learning included: module fatigue, that can contribute to decreased quality of learning, and a lack of in-person interaction, which may make it difficult to master certain competencies like team functioning or collaborative leadership (Grace et al., 2023).

Synchronous Online Learning

Synchronous learning refers to any learning where the teacher and instructor are present at the same time, this can include live online meetings (Suliman et al., 2022). Synchronous learning requires that learners participate at a pre-determined time (De Gagne, 2021). As opposed to asynchronous learning, which is frequently set up so learners can work at their own pace, synchronous learners often work at the pace of the group with real-time instructor support (Suliman et al., 2022). Song and Park (2021) note that synchronous communications provide learners with psychological motivation, but learners may struggle to process complex information. Suliman et al. (2022) compared online synchronous and online asynchronous educational interventions for third- and fourth-year nursing students and found that both synchronous and asynchronous resulted in significant increases and knowledge and abilities ($p<.001$). There was no significant difference in outcomes for synchronous, compared to asynchronous learning in this study (Suliman et al., 2022).

Practice Intervention

Virtual, asynchronous video learning lent itself as the most feasible and desirable method of education for the practice as time constraints were the most critical factor in determining the ability of the entire staff to complete a training and this method allows staff to complete the training on their own time. Likewise, this method allows the practice to reuse this video learning to on-board new staff in the future at minimal cost to the practice. Additionally, evidence shows that asynchronous interprofessional education lends itself well to introduce objectives like role clarification and conflict resolution so that learners are better prepared to practice and master these skills in a synchronous setting (Grace et al., 2023). As this project also contained a synchronous in-situ simulation portion, asynchronous learning for the initial training served to introduce topics, especially role clarification, that were later practiced in simulation. Grace et al.

(2023) note that role clarification, described as understanding the roles of each member of the healthcare team, is important for effective collaboration, care coordination and utilization of each professional's expertise.

Simulation & Debriefing

Simulation is an educational method that can be used to enable clinical learning in a safe environment (Lee et al., 2020). The International Nursing Association for Clinical Simulation and Learning (INACSL) Standards Committee published the fourth edition of Healthcare Simulation Standards of Best Practice in 2021 (INACSL Standards Committee, 2021d). Simulation-enhanced interprofessional education (Sim-IPE) includes multidisciplinary healthcare professionals in simulation experiences to achieve shared objectives (INACSL Standards Committee, 2021c).

The office planned an interprofessional simulation education experience developed to align with office goals and resources as well as the INACSL committee's published standards. The simulation experience includes a prebriefing, followed by the simulation and then subsequently a debriefing. The prebriefing serves to establish a psychologically safe environment and set ground rules for the simulation (INACSL, 2021b). A planned debriefing is a requirement for all simulations; the debriefing serves to resolve gaps in knowledge, attitude, skills, and communication within the team (INACSL, 2021a). The National League for Nursing (2015) notes that "the process of coming to know why an action was taken reveals the knowledge, assumptions, values, beliefs, and feelings behind the action and attaches meaning to information" (p.3). Structured debriefing methods like video debriefing, using Debriefing for Meaningful Learning (DML), or Lasater Clinical Judgment Rubric (LCJR), have been shown to improve learning outcomes compared to discussion alone (Lee et al., 2020). This project used a debriefing

model that best suits the goals of this project called 3D Model of Debriefing: Defusing, Discovering, and Deepening (Zigmont, 2011).

Rationale

There is a concept that is important to understand regarding this literature review topic. Ideally, when assessing the effectiveness of an intervention on the emergency preparedness of an office, the dependent variable would be actual resuscitations or quality of care during an emergency on the outcomes of patients who had an emergency within the pediatric setting; however, due to the infrequency of pediatric primary care office emergencies, it is not possible to measure these directly in any way that would be ethical or meaningful, therefore, studies choose to measure what are believed to be valid proxies (Bordley et al., 2003). As such, measures of staff comfort in handling emergencies, levels of emergency preparedness as defined by checklists, and performance on clinical in-situ simulation are used as alternatives or proxy measures to provide meaning to the implemented interventions. Each study considered for this project measured different aspects of emergency preparedness; this project chose measures that were the most feasible and meaningful to the practice. For the purposes of this project, "emergency" was defined as any situation in which a patient's clinical condition necessitates immediate medical intervention and activation of emergency medical services for rapid transportation to a higher level of care.

This project was guided by Social Learning Theory, which is related to constructivism (De Gagne, 2021). Constructivism is a learning theory in which knowledge is built onto past experiences by using processes of action and reflection (De Gagne, 2021, p. 120). Albert Bandura's Social Learning Theory notes that humans learn within the environment through observational learning, imitation, and modeling (Phillips, 2021). Continuous interaction of the

environment, behaviors, and cognition facilitates learning (Phillips, 2021). Learning occurs through three processes “attention or observation, retention or processing in memory, and motivation or having a reason to replicate another’s behavior” (Phillips, 2021, p. 36).

Kurt Lewin’s theory of change was used to guide the implementation of this project. Lewin’s theory outlines three phases of change: unfreezing, change, and freezing (Zaccagnini & Pechacek, 2021). The first step of “unfreezing” refers to the process of preparing for a change by shifting the current view of the problem and breaking down old notions and beliefs regarding the subject (Zaccagnini & Pechacek, 2021). This office has had similar office preparedness levels and beliefs regarding what is appropriate for their site for more than twenty years, meaning the process of unfreezing was exceptionally important but also challenging. The unfreezing process included meeting with stakeholders and presenting evidence regarding the need for change as well as engaging in collaboration to develop an intervention that could be done in a way that was effective but also appropriate for this specific office setting. The “change” portion of this theory was implemented in the form of establishing an office policy and procedure and conducting a combination educational intervention and in-situ simulation within the office. Lastly, the process of “refreezing” was undertaken to freeze the new process into place by regular maintenance of equipment and regular staff training as outlined in the novel office policy (Zaccagnini & Pechacek, 2021).

Specific Aims

The purpose of this project was to improve the ability of medical and non-medical staff to respond to clinical emergencies in one pediatric primary care office. The overarching aim was to develop a practice-specific emergency preparedness policy and procedure and implement a

training to increase medical and non-medical staff knowledge and comfort in managing emergencies. The specific aims of this project were:

- Gather input from at least two people from each discipline (physicians, RNs, front desk staff) to incorporate into emergency plan development & collaborate with clinical and non-clinical staff to develop a practice-specific emergency preparedness policy and procedure
- Order and strategically stock 90% of emergency supplies and equipment outlined in the novel office policy
- 70% of staff will obtain BLS for healthcare providers CPR certification
- Implement an asynchronous video training to implement the new office-specific emergency policy and procedure immediately followed by an in-situ simulation
- 75% of staff will attend the asynchronous video training and simulation
- 75% of staff will complete the debriefing and post-implementation survey
- After the training and simulation:
    - 75% of staff will self-report increase in knowledge about how to respond to an emergency after the training and simulation
    - 75% of staff will self-report an increase in skills
    - 75% of staff will self-report increased confidence in understanding their role during and emergency
    - 75% of staff will report they feel more knowledgeable about which equipment is stocked in the office
    - 75% of staff will report they feel more confident in their ability to locate emergency equipment and materials within the office

    - 75% of staff will be satisfied that the training and simulation were effective in meeting their goals
    - 75% of staff will report the simulation added value to the learning experience
- Achieve 50% increase in office emergency preparedness according to the AAP Policy Statement for pediatric office emergency preparedness utilizing comparison of a pre-post checklist

Methods

Context

The setting for this project was a pediatric primary care practice consisting of four physicians (one physician retired during project development and implementation), one nurse practitioner, six RN's, three MA's, three front desk staff members, and one office manager (office manager was hired during project development). On any given day, the practice may see up to 90 patients for both acute and well visits as well as clinical nurse visits. The practice is open seven days a week including weekends and holidays, only closing on Christmas Day and the day of the local marathon, as the practice is located along the marathon route. Additionally, an on-call provider is always available outside of working office hours. This practice has been established in the community it serves for almost 30 years and many of the families in the practice have been with the practice for multiple generations. The main driving force of this practice has always been an emphasis on patient and family centered care. This practice is very successful at meeting the healthcare needs of patients and families in a timely and safe manner. To accomplish the enormous amount of work required to run the practice, all team members work together in both a collaborative and supportive manner to ensure patients' needs are met Up until this point, there has not been focus, opportunity, or resources available for formal

training or continuing education within the practice. Although there is always a focus on evidence-based care for patients, this is generally accomplished through the individual research and practice of the treating providers. Physicians, however, do take time to educate individuals in the form of answering inquiries that may arise amongst the nursing staff. The leadership takes time to listen to staff and respond to needs and concerns.

The lack of compliance with the AAP Policy Statement for Emergency Preparedness and general lack of emergency preparedness at this practice was a result of a combination of complex intertwining factors that are explored in a fishbone diagram (Appendix B). The rapid EMS response time at the practice and the infrequency of emergencies contributed to a general complacency with the status quo that emergency preparedness measures were not necessarily important. Short staffing and heavy workloads contributed to the lack of manpower resources available to maintain emergency equipment, let alone identify office needs for training, equipment, or medications. The lack of emergency policy and procedures and lack of time for training led to a lack of CPR certification requirements and lack of training for staff. However, despite the general complacency with the lack of emergency preparedness in the office, after presentation of the AAP policy to leadership, and raising concern over the lack of preparedness, informal discussions with leadership yielded strong support for the development and implementation of an emergency preparedness policy and procedure and a willingness to provide the resources and time needed for staff education.

An external mapping tool (Appendix C) explored the complexity of the microsystem for the subpopulation of pediatric patients experiencing a medical emergency within the practice. Involved in this microsystem are the physicians or NP treating the patient, the RNs or MA supporting the providers, the front desk staff participating in the emergency response, the

responding EMS, the receiving emergency room, the parents accompanying the patient, as well as the medical supplies including equipment and medications, and ultimately the billing team who will bill for the encounter. The specific healthcare needs of the patient experiencing an emergency include the need for prompt recognition of the emergency, prompt activation of EMS, appropriate medical care to stabilize the patient until EMS arrives, and rapid transport via EMS to the appropriate emergency room. The external mapping tool notates the participants within the microsystem that this project targeted to achieve its goals, namely the physicians, NP, RNs, MAs, and front desk staff.

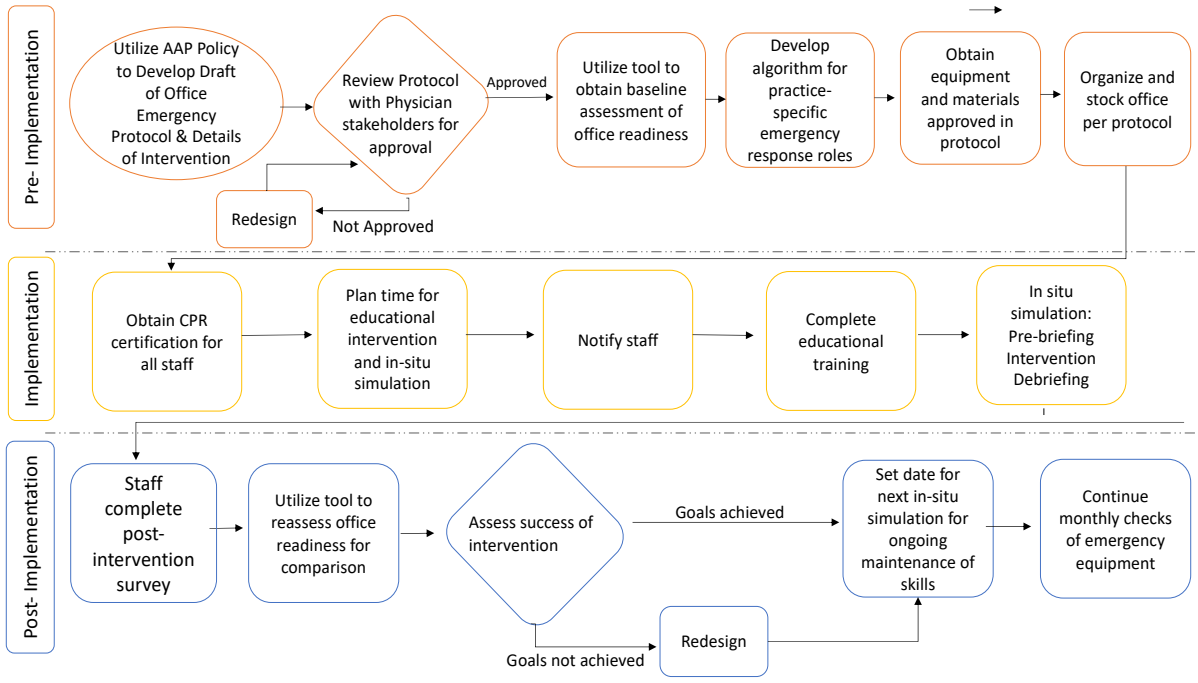
Identification of real and potential driving and restraining forces was completed and diagramed in a force field analysis (Appendix D). Driving forces included: the support from two physicians for this project, the increase in patient safety afforded by having proper staff training and an emergency policy and procedure in place, the concern that if an emergency were to occur in the current un-prepared state that a patient could have a bad outcome or experience harm, and the overarching need to come into compliance with the AAP Policy for office emergency preparedness. Potential driving forces included further leadership support and potential staff interest in the proposed training. Restraining forces were a lack of staff CPR certification, lack of storage space in the office, as well as a current lack of emergency medications and equipment. Potential restraining forces were a possible resistance to participation in staff training, cost of emergency equipment, a lack of time available for training, and the shortages and backorder of equipment and medications.

Intervention

The intervention for this project was multi-step: first an office policy and procedure was developed and implemented, followed by an asynchronous video training and in-situ simulation. After simulation, a structured debriefing session was conducted to reflect on the simulation, to "resolve gaps in knowledge, skills, attitudes, and communication" and identify latent safety threats (INACSL, 2021a, p. 27). A logic model (Appendix E) was created to establish desired

Figure 1

Intervention Flowchart



outcomes and impacts of these interventions and to guide their development. This project is outlined in an intervention flowchart (Figure 1). The format for this paper is tailored to the Squire 2.0 Guidelines for performance improvement or quality improvement projects (Ogrinc et al., 2015).

In the pre-implementation stage, this project commenced by gathering input through informal conversations with staff from all disciplines that were represented in the office including physicians, nurses, and front-desk office staff. Data was gathered during informal discussions by asking the following questions:

- What types of medical emergencies have you experienced in the office?
- What knowledge or skills do you think would be important for you or other staff members to learn to improve our ability to adequately and safety to respond to an emergency?
- What equipment should be available during an emergency that is not currently available in the office?
- What policies and/or procedures do you think should be established in our office in the event of an emergency?

Next, utilizing the AAP Policy Statement on pediatric office emergency preparedness and input from all disciplines, a practice-specific policy and procedure was drafted which included details of the educational intervention and in-situ simulation. The policy and procedure and proposed intervention were approved by physician stakeholders with minimal revisions based on feedback. The completed policy and procedure can be found in Appendix F (office-specific information has been redacted). Office policy and procedure development followed the recommendations listed in the American Academy of Pediatrics (2007) policy statement *Preparation for emergencies in the offices of pediatricians and pediatric primary care providers*. These recommendations can be found in Appendix G. As recommended, the project lead first completed a self-assessment of preparedness for pediatric emergencies, which is a series of

questions taken from Appendix 1 of the American Academy of Pediatrics' (2007) policy statement (Appendix H).

The Office Preparedness Checklist Tool (Appendix I) was utilized to obtain a baseline assessment of office preparedness for emergencies. The Office Preparedness Checklist Tool was adapted from Abulebda, K., Yuknis, M. L., Whitfill, T., & Montgomery, E. E. (2021). Preparedness for Pediatric Office Emergencies: A Multicenter, Simulation-Based Study. *Pediatrics, 148*(3), 65–74. https://doi.org/10.1542/peds.2020-038463, the information for these checklists were taken directly from the AAP (2007) Policy Statement. A similar checklist tool was used in Garrow, A., Zaveri, P., Yuknis, M., Abulebda, K., Auerbach, M. & Thomas, E. (2020). Using Simulation to Measure and Improve Pediatric Primary Care Offices Emergency Readiness. Simulation in Healthcare: *The Journal of the Society for Simulation in Healthcare 15*(3):p172-192.

After determining which items were necessary for the office to stock, the project lead completed the pre-assessment checklist to determine which items were already available in the office and which items needed to be ordered. The site mentor and project lead also agreed that the best method for stocking emergency equipment in the office would be in the form of a mobile emergency cart in which equipment could be maintained and moved to the site of an emergency when needed. Over the course of the next few months, the project lead collaborated with other staff members to order the necessary emergency equipment for the office and then stocked it strategically within the office. This process included the purchase of both an AED and emergency equipment cart. .

In the implementation phase of this project, staff obtained BLS CPR certification from the American Heart Association. It was determined that CPR certification for staff members

would be best accomplished by staff members completing asynchronous online training followed by an in-person skills check off. The local fire department was able to send a CPR instructor to the office to complete the skills check-off which completed the staff's certification. The skills check off was at no cost to the office and offered gratis by the local fire department.

After CPR Certification, staff completed an asynchronous video training in which the project lead created a narrated PowerPoint that reviewed the office policy and procedure in detail. The training also introduced the concepts of in-situ simulation and safe simulation. The narrated PowerPoint was approved by the site mentor, prior to dissemination. The PowerPoint slides for the office training are available in Appendix J. Staff were paid for time spent viewing the training video. Participation in the asynchronous training was recorded.

In May of 2024, preparations were made for the in-situ simulation within the office. The project lead wrote a prebriefing script that followed guidance from *The 3D model of debriefing: defusing, discovering, and deepening* by Zigmont et al. (2011). The pre-briefing served to orient participants to the components of the simulation, introduce the post-implementation survey, establish the project lead's role as the facilitator, explain the purpose of simulation and made it clear to participants that their performance in simulation would not be reflected in performance reviews. The pre-briefing also established ground rules for simulation, goals for the specific simulation and explained how to proceed through the simulation including how to obtain exam information as well as begin and end the simulation. The pre-briefing script is available in Appendix K.

The project lead developed a simulation scenario; the choice of simulation scenario was guided by responses from the informal survey in which multiple staff members reported they had experienced children in the office in respiratory distress. The AAP (2007) policy statement

offered ideas for simulation scenarios that offices can practice; a scenario was adapted from these recommended scenarios. The project lead used a scenario template from EM Sim Cases to develop the scenario, the subject of which was an 8-year-old child experiencing an asthma exacerbation and presenting to the pediatric primary care office in respiratory distress. The developed scenario is available in Appendix L. Utilizing the guidance from *The 3D model of debriefing: defusing, discovering, and deepening* by Zigmont et al. (2011) the project lead developed a debriefing worksheet to utilize during the debriefing which is available in Appendix V.

In May of 2024, the project lead conducted the in-situ simulation during a lunch hour. Staff were notified of the date of the simulation approximately one week ahead of time. Overall, the entire prebriefing, simulation and debriefing with post-implementation survey took approximately 30 minutes. Attendance at the in-situ simulation as well as participation in the debriefing and completion of the post-implementation survey was tracked.

In the post-implementation phase of this project, staff completed a post-intervention survey (Appendix M). The same office preparedness checklist tool (Appendix I) was used to reassess the current state of office preparedness for comparison to pre-intervention levels.

Evaluation of the Intervention

The evaluation of this intervention was completed and guided by both the specific aims and the logic model (Appendix E). This project followed a PDSA guided framework in which cycles of plan, do, study, act facilitated continuous evaluation at multiple steps of this project. PDSA cycles were used to build knowledge to help answer questions (Langley et al., 2009), which was relevant when gathering input and feedback from office staff and evaluating the

simulation and debriefing. Outcomes were evaluated against their correlated specific aims using both descriptive statistics (frequency and proportion) and synthesis of qualitative data.

Measures and Analysis

Intervention specific measures are laid out in the third column of the created measures table (Appendix N). Analysis methods for this quality improvement project are detailed in column 6 of the measure table in Appendix N.

Aim 1: Gather Input from at least Two People from Each Discipline

In the pre-implementation phase, input was gathered from stakeholders regarding policy and procedure development. The amount of input was to be considered adequate when input was gathered from at least two persons within each discipline namely two RN's, two physicians, and two front desk-staff. Qualitative data, in the form of conversation notes, was analyzed and synthesized into meaningful suggestions to be used during the development process for the policy and procedure. This specific aim will be considered achieved when an office-specific policy and procedure is completed that reflects evidence of input from multidisciplinary office staff members.

Aim 2: Order and Strategically Stock 90% of Emergency Supplies and Equipment

In the next step of the pre-implementation phase, equipment deemed necessary in the newly developed policy and procedure's equipment and supply checklist will be ordered and stocked. In analyzing the equipment and supplies, the proportion of stocked items present in the office compared to the items laid out in the policy procedure as necessary will be calculated as a percentage. This specific aim will be considered achieved when 90% of emergency supplies and equipment identified in the policy and procedure checklist are stocked within the office. The checklist tool, shown in Appendix I, will collect and manage the data from this aim.

Aim 3: 70% of Staff will Obtain BLS for Healthcare Providers CPR Certification

To start the implementation phase, BLS CPR certification will be obtained by 70% of clinical staff, including physicians, nurses and MA's. The level of compliance with CPR certification will be analyzed by calculating a percentage of clinical staff that turn in CPR certification cards to the total number of clinical staff in the office, with a goal of 70% of clinical staff certified.

Aim 4: 75% of Staff Will Complete the Asynchronous Training and Simulation

Attendance to the education intervention and in-situ simulation will be taken by recording the names off staff present at the intervention. Attendance data will be analyzed by calculating the proportion of staff that participate in the training compared to the total number of staff in the office, with a goal of 75% participation.

Aim 5: 75% of Staff Will Complete the Debriefing and Post-Implementation Survey

Level of participation in the post-intervention survey and debriefing will be measured by assessing the number of post-intervention surveys that are received. Participation will be analyzed by calculating the proportion of staff that turn in a completed post-intervention survey to the total number of staff in the office, with a goal of 75% participation.

Aim 6: Post-Implementation Survey Measures

On the post-intervention survey, participants will be provided a series of statements and asked to rate on a Likert scale whether they "strong agree" (=5), "agree" (=4), "neutral" (=3), "disagree" (=2), or "strongly disagree" (=1) with the statement. The following statements will be provided to participants for rating:

During this training and simulation:

- I learned things that increased my knowledge about how to respond to an emergency in our office.
- I gained skills that I will use if an emergency occurs in the office.

After this training and simulation:

- I feel more confident that I understand my role during an emergency than I did prior to the training and simulation.
- I feel more comfortable responding to an emergency than I did prior to the training and simulation.
- I feel more knowledgeable about which emergency equipment is stocked in the office than I did prior to this training and simulation.
- I feel more confident in my ability to locate emergency equipment and materials quickly than I did prior to the training and simulation.

Overall:

- The goal of the training was to provide training on our office policy and procedure for responding to emergencies. I feel this training effective in meeting this goal.
- The goal of the simulation was to provide all staff the opportunity to practice responding to an emergency. I feel this simulation was effective in meeting this goal.
- I feel the simulation added value to this learning experience. (***value added*****=** enhanced or made more effective).

Ratings of "4" and "5" on the Likert scale are considered affirmative responses for the purposes of calculation the frequency of affirmative responses. Frequency of affirmative

responses will be analyzed to the individual questions and will be calculated against the total number of surveys received. The specific aim will be considered achieved if 75% of staff report affirmative responses to each individual statement respectively.

Aim 7: Achieve 50% increase in office emergency preparedness

Immediately after developing the office-based policy and procedure during the pre-implementation phase, a baseline office assessment will be performed by utilizing an office preparedness checklist that assesses for various aspects of office readiness including equipment availability and training procedures. This checklist will be repeated in the post-implementation phase and the percentage of compliance with the checklist will be calculated and these scores compared to assess for levels of change in office preparedness pre and post intervention with a goal of a 50% increase in office emergency preparedness scores. A checklist tool, shown in Appendix I, will collect and manage the data from this aim.

Ethical Considerations

In terms of ethical considerations, it was explained to all staff that this project is purely a practice-wide learning experience and there are no ramifications related to participation or performance during these interventions. Specifically, staff was advised that their performance during the in-situ simulation would not affect their job role. It was made clear to staff during the simulation pre-briefing that their performance during the simulation will not be noted in their annual performance review. Another ethical consideration that arose was one staff member felt too anxious regarding participating in the simulation. The project lead made arrangements, in a private conversation, to have this person excluded from participation. The prebriefing for the simulation served to set up a safe learning environment, which is required before participants can

actively reflect on their learning and requires confidentiality for all participants performance and group discussions (Zigmont, 2011).

Another relevant ethical consideration was ensuring confidentiality of all post-implementation survey responses. To ensure confidentiality, these surveys were handwritten and anonymous, conducted in an area that is not directly supervised by the project lead and placed by the participant in a designated area collectively with other completed surveys. The project lead did not review surveys until all surveys were completed and collected and after the completion of the in-situ simulation.

At this local site, there is no formal review process for quality improvement projects; however, this project was reviewed with office leadership as well as the quality and safety contact who oversees quality and safety for all the offices within our group. All leadership was supportive and excited about this intervention and the project was approved by our quality and safety officer without requirements for further review. The IRB approved University of Massachusetts clinical quality improvement checklist (Appendix O) was completed and demonstrates that this project meets the criteria for quality improvement and not human-subject research. The project proposed is quality improvement and does not meet the definition of human subject's research because it is not designed to generate generalizable findings but rather to provide immediate and continuous improvement feedback in the local setting in which the project is carried out. The University of Massachusetts Boston IRB has determined that quality improvement projects do not need to be reviewed by the IRB.

Results

Aim 1: Gather Input from at least Two People from Each Discipline

The project lead conducted informal discussions with one physician, one RN, one medical assistant and three front desk staff, which included the office manager. Verbal responses were written down by the project lead on paper and then transferred to the informal discussions data management tool (Appendix P). Qualitative data was recorded and reviewed to synthesize common responses that were considered in the policy and procedure development.

Both unique and similar responses emerged in the informal discussions. In terms of types of medical emergencies experienced in the office, multiple respondents reported they had experienced patients fainting and patients in respiratory distress or with low oxygen levels. Staff also reported they encountered patients with toxic shock syndrome and fainting with head strike.

Multiple staff members reported that they believed CPR was important for staff to learn to improve the ability of the office to adequately and safely respond to emergencies. Other responses included "being able to find emergency equipment readily" and "feeling comfortable using emergency equipment." One staff member responded that staff should be able to recognize warning signs of an emergency, for example, like signs of a stroke.

Reponses regarding emergency equipment that should be available in the office in case of an emergency that is not currently available included an AED, CPR backboard, light system to notify in case of emergencies, oxygen tanks, and oral glucose.

Responses to "What policies and/or procedures do you think should be established in our office in the event of an emergency" yielded many responses. Responses included: rapid response or code blue protocol, how to alert others in case of an emergency, how to expedite a patient evaluation and alert other physicians and staff quickly, how to respond in case of patient syncope, how and when to interrupt a clinician in an exam room, defining roles during an emergency, and how to not panic during an emergency. Responses to the informal discussions

were considered in the development of the office policy and procedure. Aim 1 was considered achieved as an office-specific policy and procedure was completed that reflected evidence of input from multidisciplinary office staff members although the goal of having two persons from each discipline provide input was not achieved.

Aim 2: Order and Strategically Stock 90% of Emergency Supplies and Equipment

It was determined that 17 pieces of emergency equipment were needed within the office (Appendix Q). After analysis of the post-assessment data, 94% of needed emergency equipment was present in the office and 94% of needed emergency equipment was strategically stocked. All percentages were rounded to whole numbers. Aim 2 was met as more than 90% of emergency equipment was present in the office and strategically stocked at the time of the post-implementation evaluation using the preparedness checklist tool, these percentages are illustrated in Figure 2. Figure 3 shows a photo of the strategically stocked emergency cart within the office.

Figure 2

Percentages of Emergency Equipment Post-Implementation

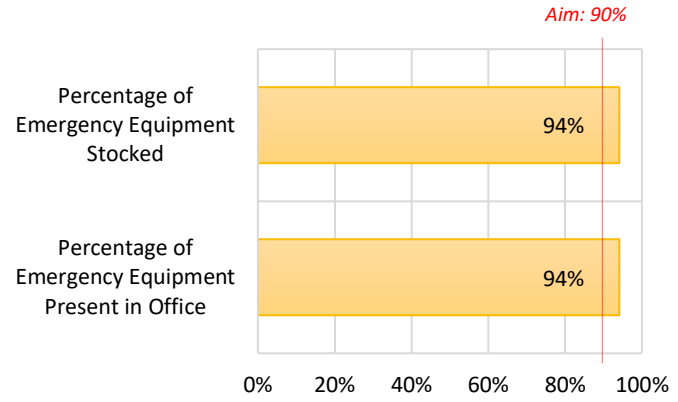


Figure 3

Office Emergency Cart

Note. Both photos show the office Emergency Cart. The figure on the left shows the cart when it is closed including the materials stored on top. The photo on the right displays the cart when it is open to reveal the labeled drawers inside.

Aim 3: 70% of Staff will Obtain BLS for Healthcare Providers

Two staff members besides the project lead, maintained their own active CPR BLS certifications prior to the intervention and provided their CPR certification cards. Two new RNs were also hired that were already BLS certified. CPR cards received from previously certified individuals were included in the final data that reflects percentage of staff certified. One staff member that no longer works for our office was certified during the implementation of this project; this staff member was not included in the final percentage of individuals certified. Two staff members completed HeartCode training but were not able to be complete the skills check off: one staff member went out on medical leave and the other staff member is per diem and went back to college for the semester.

The level of compliance with CPR certification was calculated as a percentage of clinical staff that turned in their CPR certification cards to the total number of clinical staff in the office. Ultimately, the aim of this intervention was met as the percentage of staff CPR certified at the end of implementation was 88%.

Figure 4

Percentage of Staff who are CPR certified

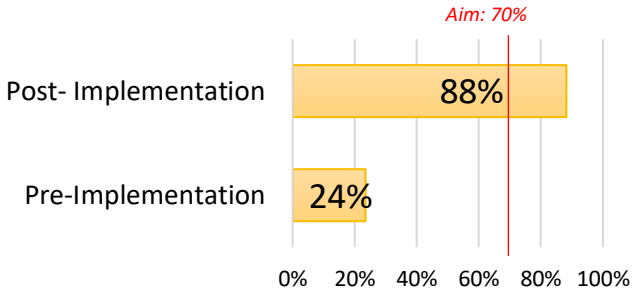


Figure 4 illustrates the percentage of staff CPR certified prior to implementation and post implementation. Compared to pre-implementation rates, the percentage of staff in the office that are CPR certified increased by 62% post-implementation.

Aim 4: 75% of Staff Will Complete the Asynchronous Training and Simulation

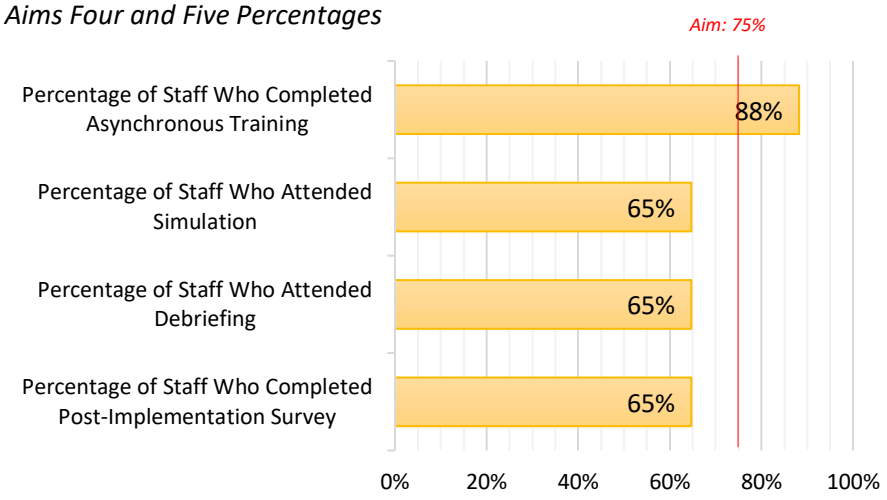
Overall, there were 15 staff members out of a total of 17 who watched the asynchronous training video, which is a total of 88%. The aim of 75% of attendance for the training was met. Overall, 11 out of 17 staff members attended the simulation, a total of 65%. The aim of 75% attendance at the simulation was not met. Rates of completion of the asynchronous training and attendance at the simulation are illustrated in Figure 5.

Aim 5: 75% of Staff Will Complete the Debriefing and Post-Implementation Survey

Overall, all of the of 11 out of 17 staff members who attended the simulation participated in the debriefing and post-implementation survey, a total of 65% each. The aims of 75% attendance at the debriefing and 75% participation in the post-implementation survey were not met, attendance rates are illustrated in Figure 5. However, 100% of staff that were present in the office on the day of the simulation participated in the debriefing and post-implementation survey.

Figure 5

Aims Four and Five Percentages

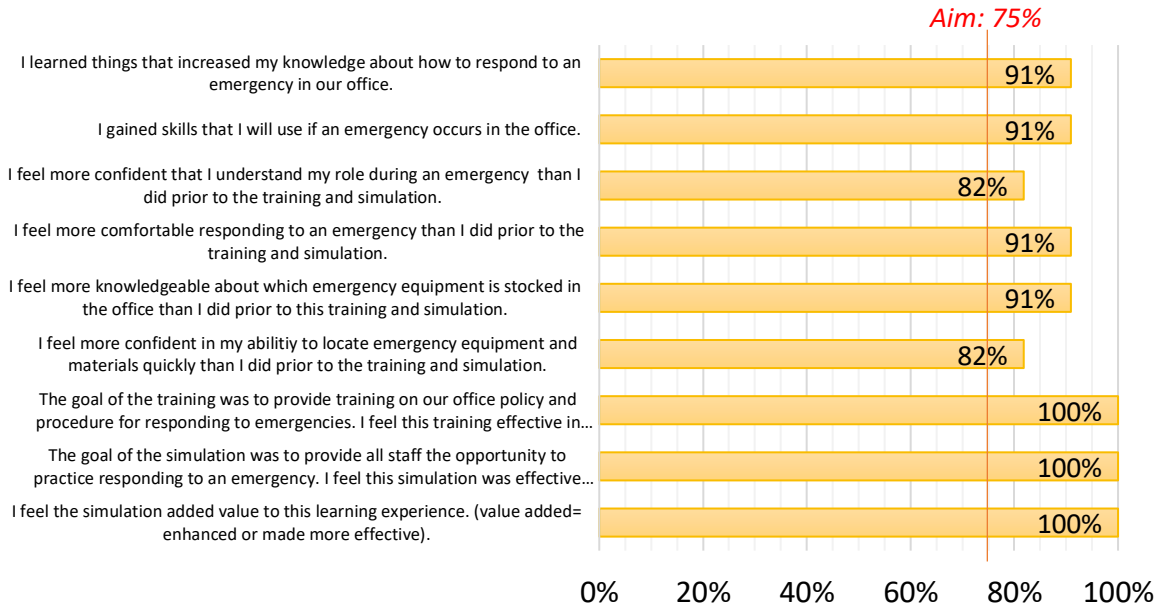


Aim 6: Post-Implementation Survey Measures

A total of 11 post-implementation surveys were collected. Survey responses were recorded into the data tracking tool available in Appendix R. The breakdown of responses as percentages is shown in Appendix S. Of note, there were no "disagree" or "strongly disagree" responses to any question from any respondent. All responses were either "neutral," "agree," or "strongly agree." The average response for each question was calculated as well as the percentage of affirmative response, meaning the percentage of responses that were either a "4" or a "5." The average response for each question is shown in Appendix T. The percentage of affirmatives responses in shown in Figure 6.

Figure 6

Percentage of Affirmative Responses to Post Implementation Survey Questions



On the post-implementation survey, 91% of staff either agreed or strongly agreed that during the training and simulation they learned things that increased their knowledge about how to respond to an emergency in the office. Likewise, 91% of staff either agreed or strongly agreed that they gained skills they will use if an emergency occurs.

Staff were asked to compare how they felt after the training and simulation to how they felt prior to the simulation; 82% of staff either agreed or strongly agreed that they felt more confident that they understand their role during an emergency. Ninety-one percent of staff either agreed or strongly agreed that they felt more comfortable responding to an emergency. Ninety-one percent of staff either agreed or strongly agreed that they felt more knowledgeable about which emergency equipment is stocked in the office and 82% of staff felt more confident in their ability to locate emergency equipment and materials quickly.

Overall, 100% of staff either agreed or strongly agreed that the goal of the training, to provide training on the office policy and procedure for responding to emergencies, was met. One hundred percent of staff either agreed or strongly agreed that the goal of the simulation, to provide all staff the opportunity to practice responding to an emergency, was met. Likewise, 100% of staff either agreed or strongly agreed that the simulation added value (defined as enhanced or made more effective) to the learning experience.

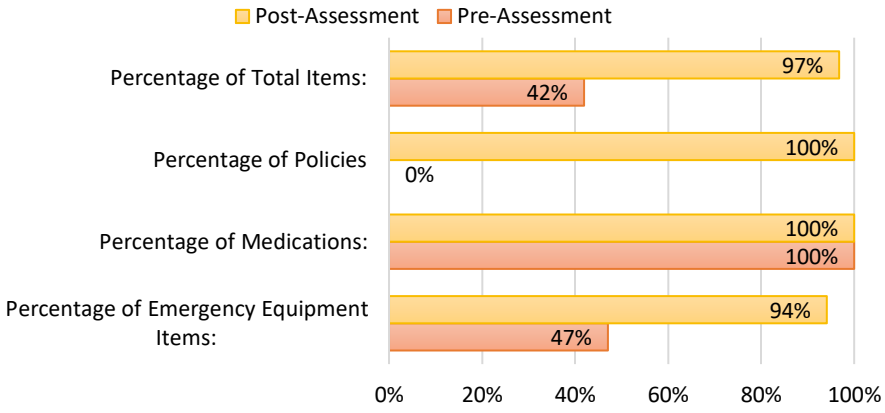
The aims for the post-implementation survey results were achieved as the responses to all questions on the post-implementation survey averaged greater than 75% affirmative responses.

Aim 7: Achieve 50% Increase in Office Emergency Preparedness

It was determined that 17 pieces of emergency equipment, five medications, and nine policies and protocols were needed for the office (Appendix Q). Prior to project implementation 47% of needed emergency equipment, 100% of needed medications and 0% of policies and protocols were present or established within the office. On the post-assessment checklist 94% of needed emergency equipment, 100% of needed medications and 100% of needed policies and protocols were available or established within the office. Pre-assessment and post-assessment percentages are illustrated in Figure 7. Percentage of total items increased from 42% on the pre-assessment to 97% on the post-assessment which represents an increase of 55% in office emergency preparedness overall. The specific aim was achieved as the goal was a 50% increase in office emergency preparedness scores.

Figure 7

Percentage of Emergency Equipment Items, Medications and Policies



Contextual Elements

A major barrier to implementation of informal discussions was that it was more difficult than anticipated to find appropriate times where staff were not otherwise engaged to conduct informal discussions. Low staffing levels, particularly a shortage of RNs, increased the difficulty of finding available times for both RNs and physicians to participate in discussions. Overall, available staff were willing to participate in the informal discussion and provided relevant

feedback. Some staff were reluctant to participate, mainly because of time constraints with their job role. An unanticipated outcome was feedback regarding emergency preparedness needs that fell out of the scope of this project including employee safety measures such as having a better eye wash station and a pull shower, what to do if someone comes to the office with a weapon, and a call tree in case of emergencies within the office building. These concerns were communicated to the office management.

The main barrier in obtaining emergency equipment items was that it was difficult to find a commercially available pre-printed drug dose card or tape that had the dosing for medications available in the office. The pre-printed drug tapes that were found to be available contained mainly drugs used in PALS or ACLS algorithms which are not relevant to this office's emergency response protocols.

Staff participated in the simulation and engaged in the debriefing. Barriers to attendance at the simulation included, it was one physician's scheduled day off, one front desk staff member was out on paid time off, two staff members were on medical leave, one staff member works from home, and one per diem employee who was not able to come to the office on the day the simulation was scheduled. One staff member did express to the project lead, prior to the simulation, that they were experiencing anxiety about participating but they were comfortable observing during the simulation. This staff member was excluded from active participation.

Discussion

Summary

The following section will address key findings that resulted from the specific aims of this project as well as well as additional findings that were not directly sought after but are relevant and valuable findings from this study.

Simulation Debriefing

Although not directly evaluated or examined, one of the most significant findings was the value of the simulation and subsequent debriefing to the office as a practice. The following text will summarize the office debriefing discussion and subsequent outcomes.

During the simulation debriefing staff reported that they felt participating in the simulation was fun and anxiety provoking. One person reported their heart felt like it was beating fast. Staff felt that things that went well included communication, hustling to get items, and that nobody was panicking. Some felt that EMS may have needed to be activated earlier in the scenario, while another person reported that they were not uncomfortable with the time point at which EMS was called as they felt the situation was fully assessed prior to activating EMS. During the scenario the patient initially was treated in the waiting room prior to being brought back to the exam room. Staff discussed that although our policy and procedure states that patients in distress are to be brought back to an exam room quickly, that sometimes it may be appropriate to treat patients in the waiting room if they are too unstable to be moved. Social learning theory lent itself well to this project which included modeling of behaviors during both policy and procedure implementation and learning during simulation.

Events that were discussed that did not go as well included struggling to quickly calculate doses of dexamethasone and using the incorrect liter flow of oxygen for the type of oxygen delivery system that was chosen. Nursing staff also tried to administer oxygen at the same time as a nebulizer and stated they were using a nasal cannula along with a nebulizer mouthpiece. This led to a teaching point on how to administer a nebulized medication utilizing an oxygen tank rather than a nebulizer machine. Later, the project lead realized that nasal cannula are not actually available in the office, making this teaching point even more relevant. Notably, Garrow

et. al (2020) also found during simulation that clinicians were unfamiliar with how to administer albuterol with oxygen rather than through a nebulizer.

Staff discussed that the recorder sheet was not completed nor was a recorder role established during the simulation. Staff discussed how it may be appropriate to flip the recorder sheet over and write down happenings in chronological order if staff are struggling to quickly and accurately fill out the recorder sheet for any reason.

Changes to the office policy and procedure that resulted from lessons learned during simulation included:

- Labeling all oxygen tubing with stickers that note what type of oxygen delivery system it is (e.g. non-rebreather), the liter flow required for the oxygen delivery system, and the FiO2 that the system provides.
- The addition of an oxygen tubing reference card to the emergency cart near the oxygen cannister. This card lists types of oxygen delivery systems, liter flow required for each system, and the percentage of FiO2 each system provides.
- Labeling all oxygen tubing with large print stickers that denote either “infant,” “child,” or “adult” masks for ease of recognition.
- The addition of a calculator to the top of the emergency cart for medication calculations.
- A plan to develop a dosage reference card for dexamethasone to keep on top of the emergency cart.
- The addition of a pen to the emergency cart, to be kept with the recorder sheets.

Key Findings

This QI project sought to improve office preparedness for clinical emergency response within a free-standing, group, pediatric primary care practice. Overall, this QI project was successful in increasing office emergency preparedness in multiple aspects.

Equipment, Policies and CPR Certification.

Using the American Academy for Pediatrics Policy Statement (2007), a comprehensive office-specific policy and procedure was developed and implemented within the office. Emergency equipment and medication needs were evaluated and 94% of needed emergency equipment was obtained and strategically stocked within the office in a manner that makes the equipment easy to locate and transport to the site of an emergency. Percentage of total items, including emergency equipment, medications, and polices increased by 55% overall, which exceeded the initial goals of this project. More staff than expected were CPR certified at the completion of this project, a total of 88% of staff, an increase of 62% certification overall. The development and implementation of a new policy and procedure that details maintenance of office preparedness and maintenance of CPR certification reflects the process of Kurt Lewin's change theory as the project lead guided the office in unfreezing our current state, changing our processes, and freezing our new processes into place (Zaccagnini & Pechacek, 2021).

Asynchronous Video Training and Simulation with Debriefing.

An asynchronous, emergency policy and procedure training video was viewed by more staff than initially sought with a total of 88% of staff completing the asynchronous training. Notably, this video remains available to use to train newly on-boarded staff in the future. All staff who participated in the post-implementation survey unanimously agreed that the asynchronous, recorded video training was successful in teaching staff about the novel office policy and procedure.

High levels of simulation and debriefing attendance proved to be more challenging than anticipated; however, 65% of office staff attended the in-situ simulation and debriefing which yielded valuable results. The findings discussed from the debriefing illustrate how a short, low-fidelity simulation was effective in allowing staff to practice team dynamics, practice office emergency response protocols and identify latent safety threats such as missing equipment, poorly labeled equipment, and opportunities for staff education. Post-implementation survey participants agreed that the simulation allowed staff to practice responding to an emergency and that the simulation added value to the training.

Responses on the post-implementation survey yielded positive feedback for the combination of the training and simulation. The vast majority of staff felt that they learned things during the training and simulation that increased their knowledge about how to respond to an emergency as well as gained skills they will use if an emergency occurs. The training and simulation were likewise successful in increasing staff's knowledge regarding what emergency equipment is stocked in the office and staff's level of confidence in their ability to locate emergency equipment and materials quickly. These findings are in line with the Social Learning Theory that guided this project in which learning takes place through interaction with the environment (Phillips, 2021).

This project yielded similar results to Shenoi et al. (2013) who conducted an education program that consisted of both an in-person didactic lecture and two mock codes. In contrast to this QI project, Shenoi et al.'s (2013) education intervention included focused information on life support skills along with personnel roles during and emergency and recognition of emergencies. Like this project, Shenoi et al. (2013) also found that their educational intervention resulted in

increased knowledge scores among physicians ($p < .002$) and nurses, although nurses had a smaller, statistically nonsignificant ($p = .13$) improvement.

In this QI project, the training and simulation were successful in increasing staff's confidence in their role during an emergency and staff's level of comfort in responding to an emergency. These results are similar to that of Shenoi et al. (2013) who found that both physicians and nurses had improvements in comfort levels in managing emergency situations. Toback et al. (2006) also utilized a combination in office training, although their training was in-person, and simulation in their effort was to evaluate whether "mock codes performed in pediatric primary care offices increase practitioner confidence to perform life-saving skills" (p.415). Like this QI project, Toback et al. (2006) found that after the mock code intervention non-medical staff reported greater comfort during medical emergencies and helped define their role during treatment of children who are critically ill. Likewise, Bordley et al. (2003) found that practices that participated in unannounced mock-codes with debriefings felt more prepared for emergencies than control practices that did not receive a mock code intervention, although this result was not statistically significant ($p=.07$). Kalidindi et al. (2018) found that simulation training enhanced reported preparedness in managing emergencies and confidence in managing emergencies for primary care office staff, but enhanced preparedness was not reported by primary care providers. Notably, this QI project did not distinguish post-implementation survey responses by staff roles within the office (e.g. non-medical staff) which limit, to an extent, the ability to compare data to many larger studies within the literature.

Strengths of the Project

The major strength of this QI project is that implementation was feasible within the office in terms of time commitment of office staff and minimizing disruption to the clinic day. The

office did not need to be closed for any period other than one 1-hour lunch period in which the simulation is conducted; however, the office is typically closed during this time. The office was able to provide staff time to complete CPR training, skills check off, and asynchronous video training with minimal disruptions to office workflow and minimal disruptions to clinic schedules. The only change to clinic schedule was on the day of the CPR skills check off and simulation: the office blocked the 10-minute time slot immediately before lunch on all provider schedules. The small, primary office group was able to complete the training, and all related pre-work, despite size, resources, and limited similar prior activities.

Another major strength of this QI project was that it was much less expensive to implement than initially anticipated. The costliest expense was the purchase of an AED, which is imperative to have within the office and a long-term investment. The project lead was able to source an AED including wall mounted lock box and all required accessories including training pads for a total of $1585 after a $500 discount special that the online vendor was running. The next most expensive item was the emergency cart which cost the office a total of $233.24. Much of the equipment that was required for stocking the emergency cart was already available in the office. The cost of additional emergency equipment items that needed to be purchased was $260.01, the breakdown of costs is listed in Appendix U. CPR certification costs totaled $504.00 In total, implementation of this project cost $2,582.25 including all equipment and CPR certification.

Interpretation

Outcomes and System Level Impacts

After this QI project, office emergency preparedness has drastically improved as emergency equipment is available in the office and strategically stocked and most staff are both CPR

certified and trained on office-specific procedures for emergency response. In terms of outcomes, the belief is that this increase in office emergency preparedness will correlate with improved patient safety in the office as staff will be capable of providing better care to patients experiencing medical emergencies and subsequently yield better patient outcomes. This QI project yields both the patient-level impacts already discussed and system impacts as it established processes for ensuring maintenance of emergency equipment and preparedness protocols as well as established processes for reoccurring staff training. Improved emergency preparedness also arguably decreases potential risk of liability as patients are less likely to experience a poor outcome in the setting of a medical emergency.

Limitations

Limitations of this work were that due to the small number of participants, this project was not able to implement a pre and post survey as there were concerns about the ability to maintain confidentiality of survey responses. Therefore, a post-implementation survey asked for respondent's *perceptions of improvement* which provided valid and important outcomes but not objective data on the significance of improvement. Likewise, the small number of participants and confidentiality concerns limited the ability to organize data by staff role (e.g. physician, RN, MA, or front desk staff) or length of employment or experience, which further limits possible implications drawn regarding intervention effectiveness based on any specific factors.

These results are likely to be reproducible in most pediatric primary care practices; however, they are most applicable to smaller (e.g. approximately 15 staff members) practices that are free-standing (not attached to a hospital or academic medical center). Information is attached in Appendix V regarding detailed process notes for any interested reader, followed by

detailed developed monthly equipment check sheets (Appendix W) and the debriefing worksheet used in this project's debriefing (Appendix X).

Conclusions

This QI project was successful in completing a multi-step intervention that resulted in clear improvement in office emergency preparedness in a pediatric primary care office. This project offers a framework for a feasible, sustainable, and cost-effective quality improvement intervention that could be utilized by other pediatric primary care offices to improve their office emergency preparedness and bring them into alignment with the policy statement for office emergency preparedness issued by the American Academy of Pediatrics (2007). Further investigation in this area should seek out answers as to how best to encourage pediatric primary care practices to evaluate their own office emergency preparedness and make improvements where opportunities arise.

Funding

Funding for this quality improvement project was provided solely for obtaining emergency equipment and training within the office setting. All funding was provided by the primary care practice in which this project took place.

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Appendix A

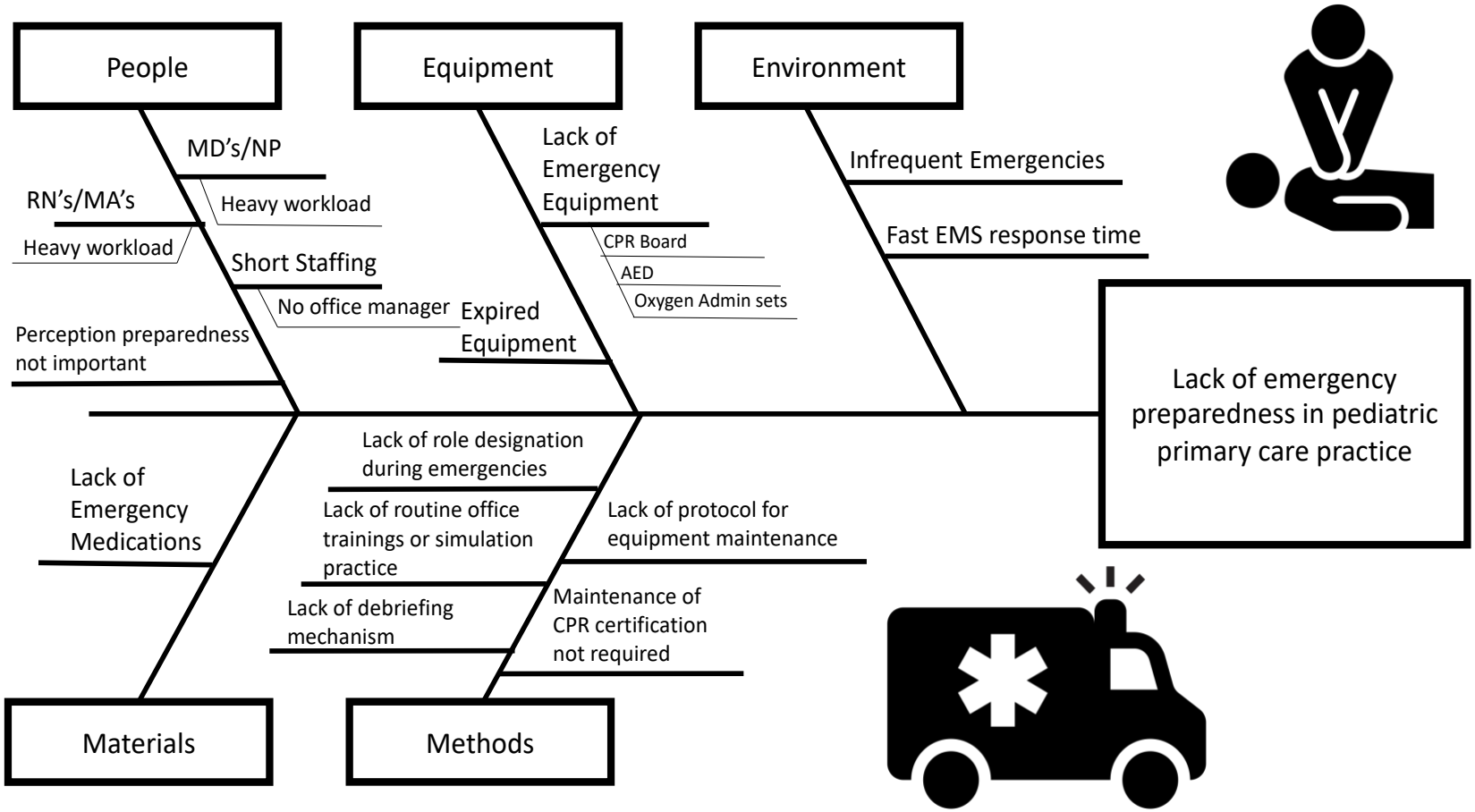
Project PICO: *Does implementation of a practice-specific emergency preparedness protocol and combination in-person didactic training and in-situ simulation increase medical and non-medical staff knowledge and comfort in managing emergencies and improve compliance with the AAP Policy Statement for pediatric office emergency preparedness as compared to pre-intervention levels*

Study	Intervention	Quality	Outcomes Studied	Sample	Findings
Intervention: Educational Intervention					
Shenoi, R., Li, J., Jones, J. & Pereira, F. (2013)	Education Pre/Post self-assessment	II: B	Knowledge Comfort in handling emergencies	50 Physicians & Nurses	Significantly improved knowledge scores among physicians although nurses had a smaller, nonsignificant improvement Significantly improved comfort levels among both physicians and nurses.
Intervention: In-situ simulation (mock code)					
Clayton Bordley, W. Travers, D., Scanlon, P., Frush, K. & Hohenhaus, S. (2003).	In-situ simulation Post-intervention Survey	I: A	Preparedness: 1. Purchase new emergency equipment and medications 2. Receive or update BLS, PALS or ALS training for staff members 3. Develop written emergency protocols	39 Pediatric Primary care practices	Intervention practices were more likely to develop written office protocols Intervention practices were more likely to receive additional BLS, PALS & ALS support training
Garrow, A., Zaveri, P., Yuknis, M., Abulebda, K., Auerbach, M. & Thomas, E. (2020).	In-situ simulation Preparedness Checklist	II: B	Preparedness: Compliance with the AAP policy statement for equipment, supplies, medication, and guidelines	143 Physicians, RN's NP's MA's and patient service representatives	Intervention allowed the office to explore emergency preparedness, areas of knowledge deficit and latent safety threats were identified and addressed Pediatric primary care office emergency preparedness was found to be variable
Kalidindi, S., Kirk, M., & Griffith, E. (2018).	In-situ simulation Pre/Post self-assessment	II: B	Preparedness: subjective Comfort level performing skills: CPR, AED and IM epinephrine Comfort level in handling emergencies	20 Pediatric primary care offices; all staff	Staff members reported enhanced preparedness and higher levels of confidence (comfort) in managing emergencies post-simulation training Simulation-based training can expose weaknesses in primary care settings' ability to handle emergencies
Yuknis, M. L., Abulebda, K., Whitfill, T., Pearson, K. J., Montgomery, E. E., Auerbach, M. A (2022).	In-situ simulation Preparedness Checklist	II: B	Preparedness: Compliance with the AAP policy statement for equipment, supplies, medication, and guidelines Quality of Care: Simulation Performance Comfort level in caring for emergencies	13 Pediatric primary care practices	Intervention allowed the office to explore emergency preparedness, areas of knowledge deficit and latent safety threats were identified and addressed Improved quality of care in a simulated setting Participants had increased comfort caring for emergencies
Intervention: Educational intervention + In-situ simulation (mock code)					
Spanos S. (2022).	Education In-situ simulation Pre/post simulation self-assessment	N/A	Observations and themes	8 pediatric primary care offices	Issues with medications, equipment, teamwork dynamics, and pediatric emergency resuscitation were revealed There was always a significant improvement from the first to the second simulation in each session Office staff felt more prepared for an emergency after the training
Toback, Fiedor, Kilpela & Reis (2006)	Education + In-situ simulation Pre/post simulation self-assessment	II: B	Confidence to perform life-saving skills	164 Physicians and staff from 11 pediatric primary care practices	Significant increases in and confidence to perform during medical emergencies

Appendix A. Evidence Synthesis Table

Appendix B

Fishbone Diagram



Appendix B. Fishbone Diagram

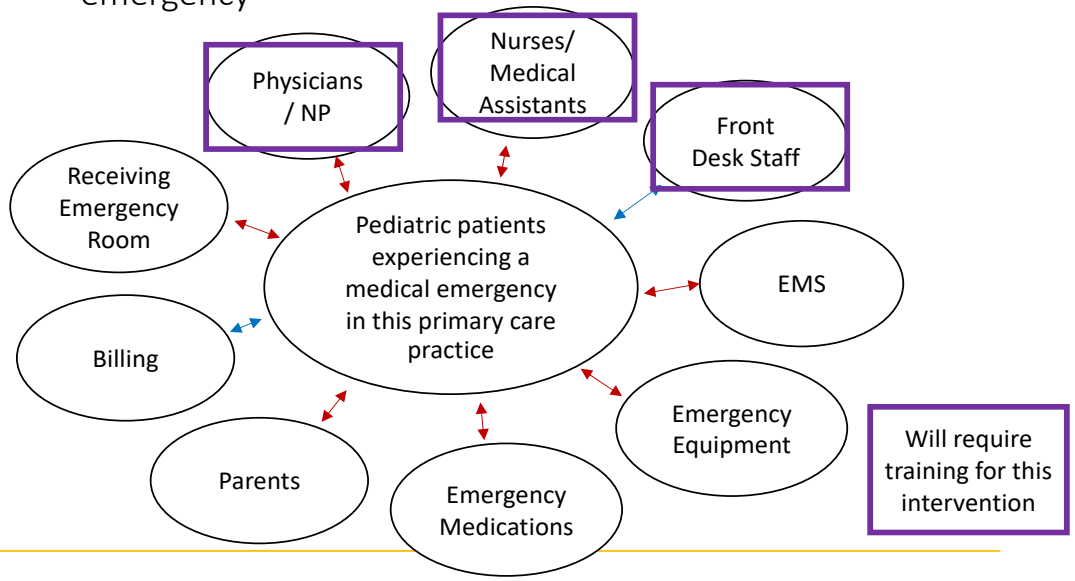
Appendix C

External Mapping Tool

Clinical Microsystem

Name: A 5 physician pediatric primary care **Subpopulation:** Pediatric patients experiencing a medical emergency

Specific Healthcare Needs
1. Prompt recognition of Emergency Situation
2. Medical care to stabilize patient until EMS arrival
3. Prompt activation of EMS
4. Transfer via EMS to appropriate Emergency Room



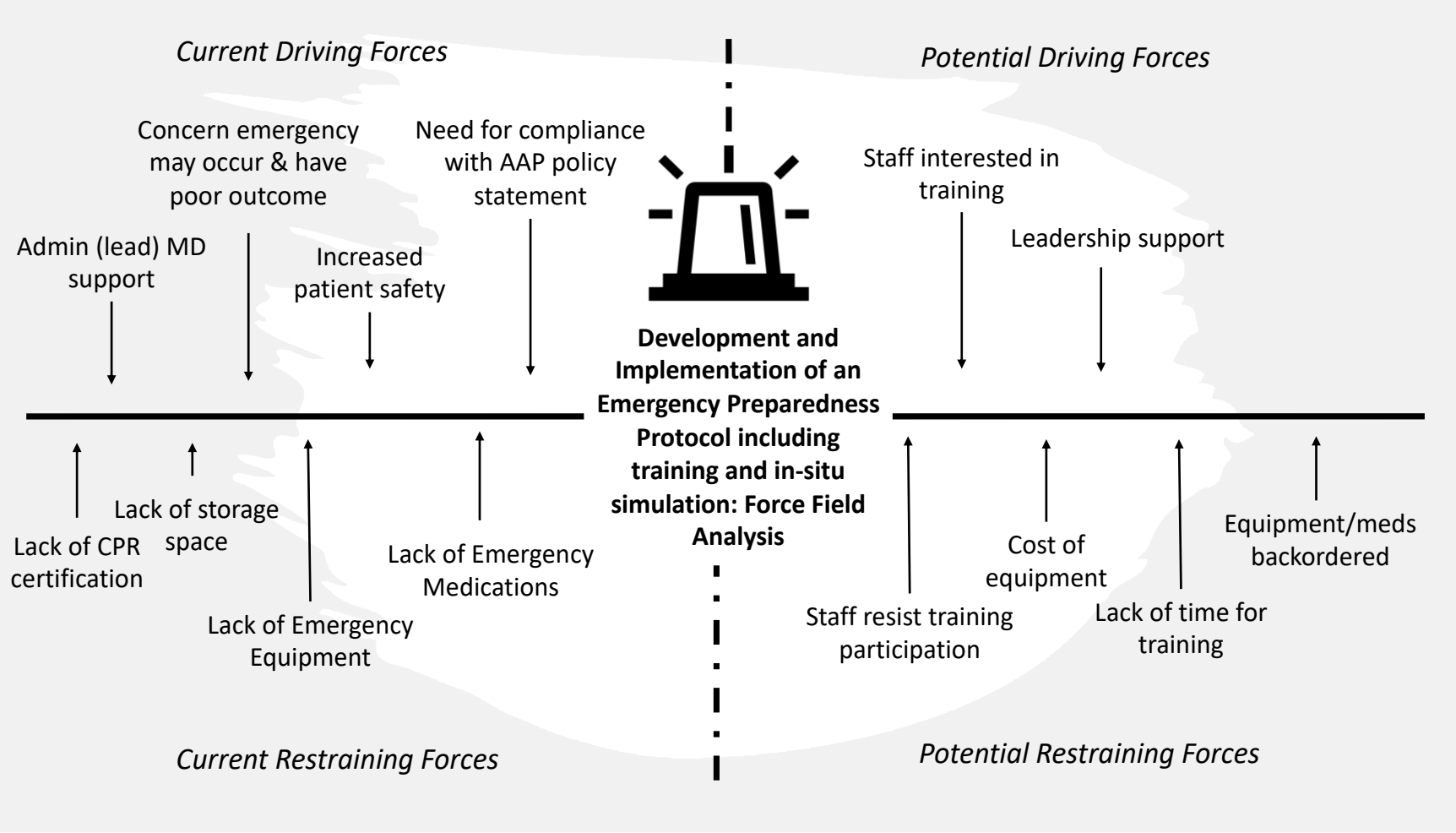
Improvement Ideas:

Develop an office-based emergency preparedness protocol to improve preparedness & facilitate quick EMS transfer; provide staff-training to increase preparedness for pediatric emergencies preparedness and increases medical and non-medical staff knowledge and comfort in managing emergencies

Appendix C. External Mapping Tool

Appendix D

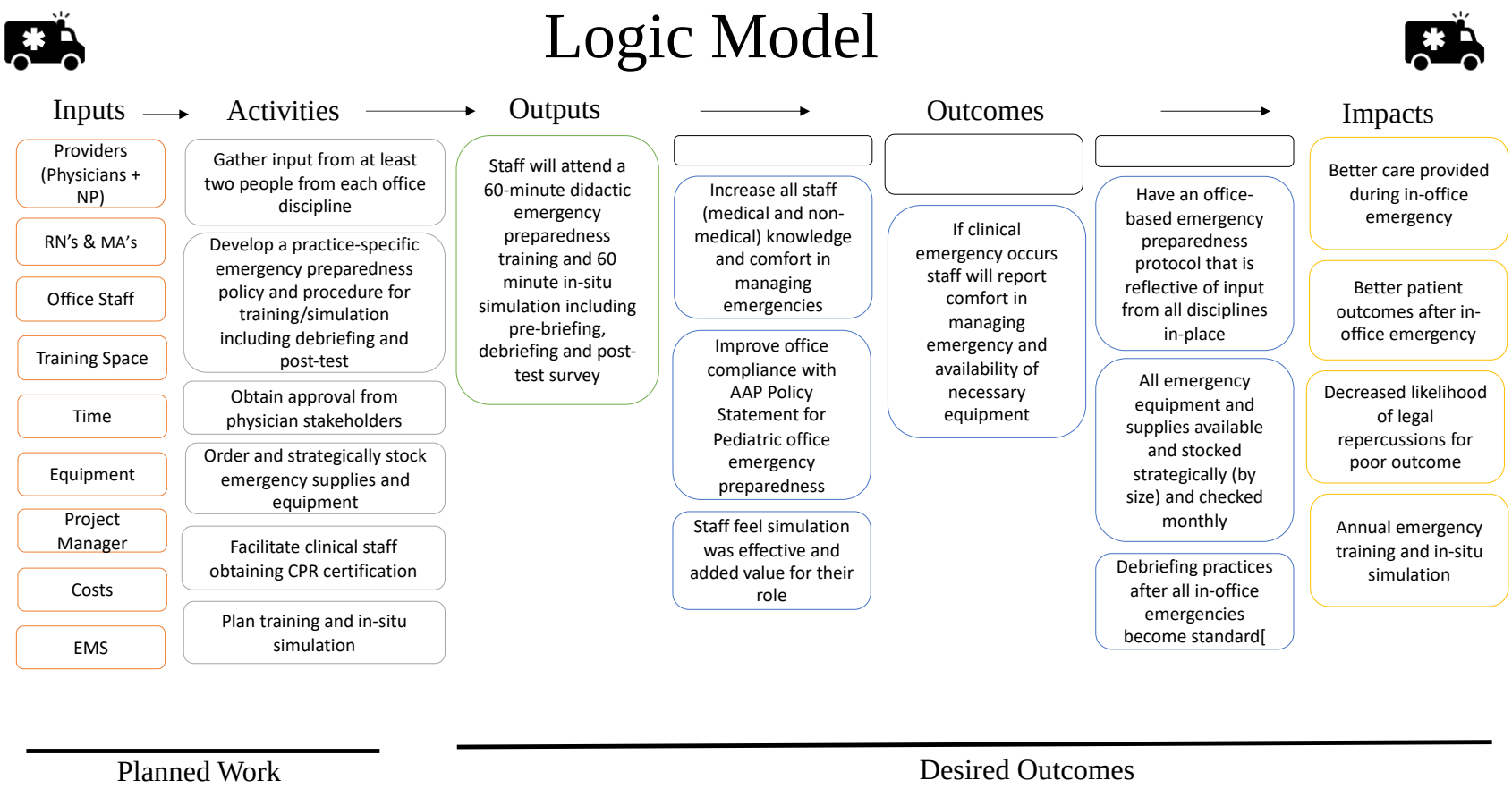
Force Field Analysis



Appendix D. Force Field Analysis

Appendix E

Logic Model



Appendix E. Logic Model

Appendix F

Emergency Policy and Procedure

Department:	Pediatrics
Title:	Policy and Procedure for Emergency Preparedness and Emergency Response
Date Effective:	5/7/2024
Renewed:	

PURPOSE: To provide a framework for medical emergency response procedures within *** Pediatrics.

APPLICABILITY: This policy applies to medical emergencies experienced by patients or non-patients within the office of *** Pediatrics.

DEFINITIONS:

ALS: Advanced Life Support

BLS: Basic Life Support

EMS: Emergency Medical Services

Closed-loop communication: Communication method between two people in which the person receiving instructions repeats the instructions back to ensure they understood correctly, and the instructor verbally confirms.

Emergency: An emergency is defined as a person identified to have no pulse, no respirations, be unconscious OR experiencing severe medical distress/signs and/or symptoms that signal a life-threatening condition.

Periods of High Staffing: Monday- Friday 9am-5pm

Periods of Low Staffing: Weekends, holidays, and weekdays between 8:30am-9am, weekdays between 5pm-5:15pm

Non-clinical staff members: Includes the office manager and front desk staff.

Clinical- staff members: Includes Physicians, Nurse Practitioners (NP), Registered Nurses (RN) and Medical Assistants (MA)

ORGANIZATIONAL PLAN FOR EMERGENCY RESPONSE WITHIN THE OFFICE

Recognition of an emergency

All staff, including front desk staff, will receive training on how to recognize signs and symptoms of a potential emergency.

It is requirement that a "Reception Desk Emergency Card" (see Appendix A) is posted next to each phone in the Reception Desk area. The "Reception Desk Emergency Card" includes information on how to recognize an emergency, important emergency telephone numbers and information regarding calling EMS for an in-office emergency.

A. In the event a patient is unconscious or does not have a pulse or respirations:

Exception: Temporary fainting where the patient quickly regains consciousness warrants in-clinic assessment by a provider.

This process also applies to non-patients (e.g. parents/guardians/accompanying adults/non-patient siblings) that are experiencing medical emergencies within our office.

- The following steps should occur simultaneously:
  - One staff member will stay with the patient and provide CPR (if appropriate) per American Heart Association BLS protocols.
  - One staff member will call 911 per EMS activation protocol.
  - One staff member will immediately notify clinical staff and bring them to the site of the emergency.

B. Recognition of a potential emergency:

e.g. experiencing severe medical distress OR signs and/or symptoms that signal a life-threatening condition.

Non-clinical staff members should follow the following steps, pneumonic: ABCD.

- **ALERT:** The staff member who recognizes a potential emergency will alert the closest non-clinical staff member (likely to be another front desk member).
- **BRING:** One staff member will bring the patient/family to an available exam room. Simultaneously, another staff member will walk to the back and notify the nearest available RN, NP or Physician and bring them to the site of the emergency (the room where the patient/family is now located).
- **CART:** One of these staff members will then obtain the emergency cart and bring it to the site of the emergency.
- **DIRECTION:** The staff members will then remain nearby until they receive further directions (e.g. notify EMS or return to the front desk).

Clinical staff members:

- The RN, NP or Physician who is brought to the site of the emergency will immediately triage the patient and determine if the situation is an emergency.
- *If an RN is the first person responding to the emergency and it is determined that the situation is an emergency, the RN will stay with the patient and*

instruct the nearest staff member to interrupt a provider and bring them to the site of the emergency.

- *At the RN's discretion (i.e. in the case of cardiac or respiratory distress), they may also notify another staff member to activate EMS at this time.*

Notes:

- *Remain calm during an emergency and use close-looped communication.*
- *If a situation is recognized as an actual or potential emergency it is acceptable to interrupt any physician, NP or RN in an exam room by knocking on the door, DO NOT WAIT.*
- *The nearest provider may not be the patient's primary care physician, in this scenario it is most appropriate to interrupt the nearest provider rather than search for the patient's PCP.*
- *If there are no available exam rooms when an emergency is recognized: If appropriate, (i.e. no on-going procedure) politely and apologetically ask the family in room 8 to temporarily re-locate to the waiting room OR collaborate with clinical staff to find an appropriate exam room (one where a patient can easily be temporarily re-located).*

Staff communication, roles, and responsibilities during emergency

Periods of High Staffing:

During an emergency the following roles will be established:

1. ***Team Leader:*** The person in charge during the emergency. This person is typically a provider. In the absence of a provider, an RN can lead the team in BLS, while waiting for EMS to arrive. The team leader is responsible for directing the medical care of the patient and ensuring that someone has been designated to call EMS (911).
2. ***First Assistant:*** Typically, an RN. This person stays with the patient and provides medical interventions (e.g. oxygen, nebulizer treatments, medications) at the direction of the team leader.
    a. *Additional clinical staff members may be recruited at the discretion of the team leader to obtain necessary medical equipment, medications or provide any needed additional assistance.*
3. ***EMS activator:*** *The person who has been instructed by the team leader or triaging RN to activate EMS by calling 911 (see Protocol to Activate EMS).*
4. ***Recorder:*** *A person assigned to record patient condition, vitals and interventions during the emergency utilizing the Emergency Documentation Sheets in Appendix C.*

During the emergency:

- ***Additional Front Desk Staff:*** *Remain calm and continue to assist patients/families in our normal fashion unless you are recruited to assist during the emergency response.*
- ***Office manager:*** *the office manager will calmly facilitate clearing a path for EMS in the waiting room and meet EMS at the door to bring them to the site of our emergency.*
    - *The office manager will also designate one front desk staff member to print a "demographics" sheet to give to the EMS providers upon their arrival.*
        - **Directions to print a demographics sheet:**

- Open patient chart in chart review -> the chart will open in the "Peds snapshot" tab.
- Click on School/Camp/Sports
- Right click in the blank space next to "Patient information" and click "Print."

Staff communication, roles, and responsibilities during emergency: Periods of Low Staffing

Weekends: On weekends one provider, one clinical staff person and one front desk person are present in the office. If a staff member recognizes an emergency, they are to walk a patient/family back to the clinical area and notify the nearest clinical staff member or provider. (Note: if the clinical staff person is a medical assistant If a person is unconscious or without a pulse or respirations follow BLS protocol. In a low staffing scenario, it may be most appropriate to call out for help to ensure clinical staff is notified promptly. Once the provider and clinical staff member are at the scene of an emergency the front desk staff person will remain at the scene of the emergency for further direction from the provider to either activate EMS per protocol or return the desk.

Staff communication, roles, and responsibilities during emergency: No provider in the office

In the unlikely event that there is no provider in the office (MD or NP), the front desk staff will notify the nearest RN and immediately call 911. An RN will serve as the team leader and provide care to the patient within the scope of their practice until EMS arrives. One staff member should attempt to get a provider on the phone to help direct care or provide clinical care as needed. To contact a provider, call the cell phone of the provider on call.

Protocol to Activate EMS

Staff will notify EMS by calling 9-1-1 from the nearest available phone. Provide EMS dispatch with the following information:

- Age and condition of child (with vital signs, if appropriate)
- Your office location (with directions and telephone number, if necessary)
- Level of clinical staff present (MD, NP, RN, MA)
- Desired transport destination (e.g. local ED, other)
- Level of EMS provider required: ALS (advanced life support) or BLS (basic life support)
- Where office personnel will be meeting them to assist in guiding EMS to location of the child

Documentation During an Emergency

During an emergency, the person designated as the recorder shall document on the Emergency Documentation Sheet (Appendix C) in real time. Documentation should include the date and time of treatment, the weight of the child (if known), medications given with dosages and response noted, information or explanations given to the family, and the condition of the child at the time of departure from the office.

EMERGENCY EQUIPMENT ORGANIZATION AND MAINTENANCE PLAN

Organization of Emergency Equipment

The AED is mounted in a lockbox on the wall in front of room 8. The lockbox also contains an additional bag of equipment that may be needed for CPR (e.g. razor, mouth shield…). This bag of equipment is attached to the AED and should always accompany the AED.

All other emergency equipment is located in the emergency cart that is stored in the hallway to the nursing office, next to the patient bathroom. Equipment within the cart will be organized according to the size of the patient that corresponds to (e.g. newborn, toddler, school age child, etc.) Each drawer will be appropriately labeled to facilitate easy recognition during an emergency.

Newly on-boarded staff members will complete a "scavenger hunt" within their first 90 days of employment to assist them in learning where emergency equipment and medications are located.

Equipment Maintenance and Checks

Emergency equipment checks will be performed monthly by a designated RN, to be designated by the office manager. Equipment checks will be completed and documented on the equipment monthly check form. The RN will ensure that each piece of equipment on the form is present in the office, stocked in the appropriate place and not expired. The office manager will review the monthly check sheets quarterly to ensure checks are up to date and documented appropriately.

If equipment is found to be missing, expired or in need of maintenance the staff member performing the check will immediately notify the office manager who will facilitate replacement or maintenance of the equipment.

EMERGENCY MEDICATION PLAN AND MAINTENANCE

Maintain recommended emergency medications and use a resuscitation aid or tool that provides suggested protocols with precalculated medication doses

Emergency Medication Checks

Emergency medication checks will be performed by a designated RN, to be designated by the office manager. Medication checks will be completed and documented on the equipment monthly check form. The designated RN will ensure that each medication on the form is present in the office and not expired. The office manager will review that monthly check sheet quarterly to ensure checks are up to date and documented appropriately.

If medication is found to be missing or expired the staff member performing the check will immediately notify the office manager who will collaborate with the nursing staff to facilitate replacement of the missing medication.

STAFF EMERGENCY PREPAREDNESS EDUCATION AND TRAINING

CPR Certification

All staff will maintain a current BLS CPR certification. The office manager will maintain a copy of each staff member's CPR certification cards. It is the responsibility of each staff member to ensure their CPR certification remains up to date. The office will coordinate bi-annual training sessions for staff that wish to be certified through our office. The office will cover the cost of BLS certification if arrangements are made with the office manager prior to purchase of the BLS course.

In-situ Simulation or "Mock Codes"

Mock codes will be conducted twice yearly. All staff members are expected to attend two "mock-code" simulations yearly. Simulations will include a prebriefing, simulation and debriefing. Each staff member will have a defined role for the simulation that is reflective of their role in the office. The simulation will also include a recorder role. During the debriefing the simulation facilitator will facilitate a critique of the simulation for learning purposes only and will maintain a list of lessons learned.

Performance at the mock codes will not be used for any other purposes other than a learning experience. Performance during simulation will not be used in performance evaluations or affect a person's role in the office. It is expected that all staff members participate respectfully.

Appendix A

APPENDIX 2A: RECEPTION DESK EMERGENCY CARD

The following signs and symptoms may signal an emergency:

- Extremely labored breathing
- Blue or pale color (cyanosis)
- Noisy breathing (wheezing or stridor)
- Altered mental status
- Seizure
- Agitation (in the parent
- Vomiting after a head injury
- Uncontrolled bleeding

If you feel a patient has symptoms that may signal an emergency, immediately alert the nearest available RN, NP or MD.

APPENDIX 2B: IMPORTANT TELEPHONE NUMBERS

- EMS provider: Call 911
- Police department: *Phone Number* (non-emergency)
- Fire department: *Phone Number* (non-emergency)
- Receiving hospital:
  - Hospital: *Phone Number*
  - Hospital: *Phone Number*
  - Hospital: *Phone Number*

- Office address and directions:

  Address:

  Address Line 1
  Address Line 2
  Address Line 3

  Directions: Directions to the Office

APPENDIX 2C: CALLING EMS FOR AN OFFICE EMERGENCY

- Call 9-1-1
- Be ready to give the emergency medical dispatcher the following information:
  - Age and condition of child (with vital signs, if appropriate)
  - Your office location (with directions and telephone number, if necessary)
  - Level of clinical staff present (e.g. MD, NP, RN, MA)
  - Where personnel will be meeting them to assist in guiding EMS to location of the child

Appendix B
Mock Code Evaluation Form

Adapted from: American Academy of Pediatrics (2007). Preparation for emergencies in the offices of pediatricians and pediatric primary care providers. Pediatrics*. 120(1):200–212.*

	Yes	No	Comments
Clinical Primary Survey			
Airway assessed initially			
Breathing then assessed			
Oxygen started for respiratory distress			
Circulation assessed			
Initial interventions			
Protocol or treatment guideline followed			
Patient reassessed frequently			
Secondary Survey (head-to-toe examination)			
Organization			
All supplies requested were available			
Supplies were found quickly when requested			
"Code form" available and/or used			
Personnel knew how to use equipment properly (O2 tanks, etc.).			
Protocols available and/or used			
Communication			
Events recorded accurately			
Roles were assigned			
Office staff reported to EMS			
EMS communicated needs/plans with office staff			
Other comments			

Appendix C
Emergency Documentation Sheets

Form from: American Academy of Pediatrics (2007). Preparation for emergencies in the offices of pediatricians and pediatric primary care providers. Pediatrics. *120(1):200–212.*

Patient_____ **Date**_____**Time**_____
Physician_____**Nurse**_____**Other**_____
Nurse_____**Nurse**_____**Other**_____

Time	Intervention	Medication/Dose/Route	HR	RR	BP	Temp	Pox	O^2	CPR

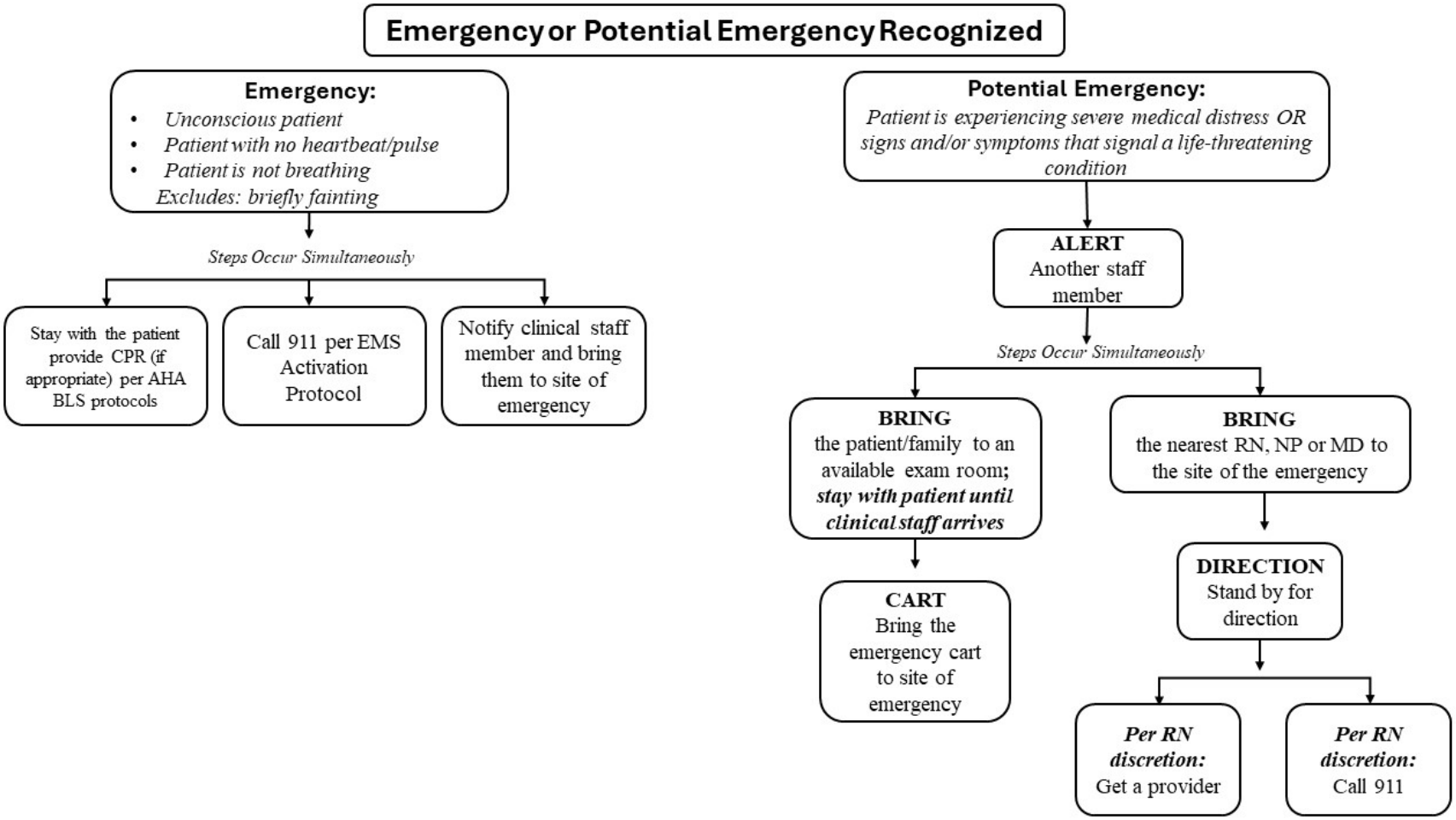
Code start time	Transferred to
EMS Time Called	Physician referred to
EMS Time Arrived	Diagnosis
EMS Time Departed	
Paramedic Names	
IO Size/Location	
IV Size/Location	

APPENDIX 6
Code chart: consider for use at time of office emergency. HR indicates heart rate; RR, respiration rate; BP, blood pressure; Pox, pulse oximetry; IO, intraosseous needle; IV, intravenous catheter.

Appendix D
Monthly Check Form Example

Office Emergency Equipment and Supplies		
Year:	January	
Emergency Cart	Present	Expiration
Cardiac arrest board/backboard		
Oxygen Tank		
Color-coded tape or preprinted drug doses		
Top of Cart		
Oropharyngeal airways (sizes 00–5)		
Nasopharyngeal airways (sizes 12–30F)		
Preprinted drug doses		
Sterile dressings		
Epi Pen Adult (0.3mg/0.3mL)		
Epi Pen Child (0.15mg/0.3ml)		
Glucometer		
Glucometer Strips		
Pulse Oximeter: Adult		Working? Y / N
Pulse Oximeter: Child		Working? Y / N
Adult Drawer		
Ambu Bag 1000mL		
Magill Forcep- Adult		
Non-rebreather adult/adolescent		
Blood Pressure Cuff: Adult		
Child Drawer		
Ambu Bag 1000mL		
Magill Forceps: Child		
Non-rebreather child		
Blood pressure Cuff: Child		
Infant Drawer		
Ambu Bag 450mL		
Magill Forcep: Infant		

Non-rebreather infant		
Bulb syringe		
Blood Pressure Cuff: Infant		
Bottom of Cart		
Stiff neck collars (small/large)		
Medications (In Lab)		
Albuterol neb solution		
DuoNeb solution		
Ceftriaxone		
Dexamethasone		
Wall Mounted		
AED		
Emergency Package Attached to AED		


Emergency or Potential Emergency Recognized
Emergency:
Unconscious patient
Patient with no heartbeat/pulse
Patient is not breathing
Excludes: briefly fainting
Steps Occur Simultaneously
Stay with the patient provide CPR (if appropriate) per AHA BLS protocols
Call 911 per EMS Activation Protocol
Notify clinical staff member and bring them to site of emergency
Potential Emergency:
Patient is experiencing severe medical distress OR signs and/or symptoms that signal a life-threatening condition
ALERT
Another staff member
Steps Occur Simultaneously
BRING
the patient/family to an available exam room; stay with patient until clinical staff arrives
CART
Bring the emergency cart to site of emergency
BRING
the nearest RN, NP or MD to the site of the emergency
DIRECTION
Stand by for direction
Per RN discretion:
Get a provider
Per RN discretion:
Call 911

Appendix G

Recommendations

Taken Verbatim From:

American Academy of Pediatrics (2007). Preparation for emergencies in the offices of pediatricians and pediatric primary care providers. *Pediatrics*. 120(1):200–212.

1. Perform a self-assessment of office readiness for emergencies based on a review of experiences of common emergent, urgent, and acute conditions treated in the office, including events involving children with special health care needs.
2. Develop an organizational plan for emergency response in the office, which includes:
    a. recognition of an emergency
    b. staff communication, roles, and responsibilities at the time of an emergency during times of high and low staffing
    c. c. protocol to access EMS
    d. d. maintaining readiness through practice (mock codes).
3. Maintain recommended emergency equipment.
    a. Organize emergency equipment in a way that facilitates access to appropriate type and size at the time of an emergency.
    b. Develop a system to check equipment on a regular basis to make sure that it is immediately available and functioning properly.
4. Maintain recommended emergency medications and use a resuscitation aid or tool that provides suggested protocols with precalculated medication doses
    a. Develop a system to check medications on a regular basis to make sure that stock is always present and expired medications are disposed of properly.
5. Develop a plan to provide education and continuing medical education for all staff.
    a. Front-line staff: recognizing emergencies; activating the emergency response plan; and understanding EMS roles, capabilities, and access
    b. Clinical staff: maintaining knowledge and skills related to pediatric emergencies
    c. All staff maintaining readiness; participating in mock codes; office checklist; office self-assessment
6. Practice mock codes in the office on a regular basis (quarterly or biannually).
    a. Involve as many staff members as possible.
    b. Include documentation as a defined role for a staff member.
    c. Critique the simulation and maintain a list of lessons learned. d. Include EMS when possible. e. Include disaster-preparedness scenarios in mock drills (see www.dukehealth.org/deps).
7. Educate families about what to do in an emergency.
    a. Encourage first aid and CPR training for parents and caregivers.
    b. Provide access number for after-hours advice, emergency response system, and poison information to families.
    c. Educate families about symptoms and situations for which they should access office advice, EMS, and poison information.
    d. Facilitate use and maintenance of emergency information forms for children with special health care needs.

8. Partner with EMS and hospital-based emergency providers to ensure optimal emergency care and emergency/disaster readiness for children.

Appendix H

Self-Assessment of Office Preparedness for Pediatric Emergencies

Questions Verbatim From:
American Academy of Pediatrics (2007). Preparation for emergencies in the offices of pediatricians and pediatric primary care providers. *Pediatrics*. 120(1):200–212.

As you answer these questions, you may be better able to identify those areas in which your office preparedness can be enhanced.

1. What emergencies have you experienced in the office setting? How often have office emergencies occurred in your practice?
    - Emergencies that have been experienced in the office include:
        i. Respiratory distress/respiratory failure
        ii. Toxic shock syndrome
        iii. Fainting
        iv. Fainting with subsequent head strike
    - Frequency of emergencies:
        i. Infrequent, approximately 1-2 per year

2. What is your office setting (freestanding office, clinic based, health center based, hospital based, other)? Are there resources outside your office on which you could call during an office emergency (e.g., security, other medical or dental professionals in the same building, hospital code team)?
    - Free standing office, non-hospital based
    - No other local resources in the building

3. What are the high and low staffing points during the times when your office is open? (Include nights and weekends if applicable.)
    - High staffing points: Monday- Friday between 9am and 5pm.
    - Lower staffing points: 8:30am to 9am before physicians arrive
    - Lowest staffing points: Saturday, Sundays and Holidays 9am-12pm when typically only one provider, 1 MA or RN and one front desk staff is present

4. What is the emergency readiness of the staff present during those times? (Include first aid, CPR, BLS, ALS, PALS, APLS, Emergency Nurse Pediatric Course, other continuing medical education, etc.)
    - Currently: inconsistently BLS certified

5. Have nonclinical staff been trained to recognize a potential or actual emergency?
    - No.

6. What anticipatory guidance and education do you provide parents regarding injury prevention, first aid and CPR training, recognizing and responding to emergencies, and accessing EMS?
    - Individual provider-level teaching during visits (well-child and acute visits)
    - RN triage education regarding return precautions, when to seem emergency medical attention for specific illnesses

7. Is your waiting room under direct observation or screened frequently by a clinical staff member? Is it childproofed?
    - The waiting room is under direct observation of non-clinical staff.
    - There is no routine screening of the waiting room by clinical staff.
    - The waiting room is childproofed.

8. Does your practice have a written protocol for response in an office emergency? Does that protocol cover times of low staffing?
    - The practice does not have any written protocols for office emergency response.

9. Do all staff members know how to access the EMS system? Staff members should be able to give the location and directions to the office, level of clinical staff present, age and condition of child (including vital signs if appropriate), desired transport location, and the level of emergency response (ALS or BLS) required.
    - All staff members are aware that EMS is activated by call 911. There is no protocol for calling 911 or standardized way of delivering information to EMS.

10. Do you have specific telephone triage protocols for nonclinical and clinical staff?
    - There are telephone triage protocols for nursing staff who are triaging patients: AAP book
    - *There are no written protocols. The protocol for non-clinical staff is to transfer the call to a clinical staff person.*

11. How far is your office from a site of definitive care, such as the nearest ED, or the nearest pediatric center?
    - Hospitals:
        i. NWH (dedicated pediatric ER, pediatric inpatient units): 9.5 miles; 20-30mins based on traffic
        ii. FUH (ER but no dedicated inpatient units): 3 miles; approximately 10 minutes

12. How long does it take for EMS to respond to a 9-1-1 call from your office?
    - Per the Natick Fire Department: emergency response would take approximately 5 minutes, maybe less.

13. Has EMS ever been to visit your office for a nonemergency call or to receive experience in evaluating pediatric patients?
    - No.

14. What level of provider comes when you call 9-1-1: first responder, BLS, or ALS? Does your local EMS have the necessary equipment and expertise to manage children?
    - Local department has paramedics on all teams. When unavailable and using “mutual aid” they try to stick to teams that have paramedics on board.
    - All local EMS teams are fully stocked and trained to manage pediatric emergencies.

15. What is the point of entry for your local 9-1-1 response team (i.e., the facility to which they are required by field protocol to bring a pediatric patient)?

    Framingham Hospital or Newton Wellesley Hospital; requests to go into the city can often be granted unless the situation warrants immediate intervention, in which case they are unable to bypass the nearest hospital.

16. If EMS does not go directly to a pediatric center on a 9-1-1 call, how do you emergently transport a child to the desired pediatric center when necessary?
    - EMS goes directly to emergency rooms with ability to manage pediatrics patients.

17. Does your office use oxygen? If so, how is it supplied? Do all clinical staff members know how to operate the oxygen canister and know where the key is kept?
    - Our office does have oxygen capabilities- various mask sizes/ non-rebreather
    - Unclear if everyone knows how to use it.

18. What emergency dosage strategy do you use in the office (code card, length-based tape, dosage book, no strategy)?
    - No strategy

19. What airway equipment do you stock? Do all staff members know how to locate, choose, and use the appropriate size of equipment for any given child?
    - No airway equipment stocked
    - No formal staff training

20. What equipment and supplies do you have on site to provide you and your staff with universal precautions?
    - Gloves
    - Masks: Surgical, KN95, N95
    - Face shields
    - Precaution gowns

21. Does your practice care for any children who are technology dependent or have special health care needs? Do you have need for any additional equipment or expertise if a technology-dependent child should have an emergency in your office?
    - No.
    - No.

22. Do you have written office protocols for common office emergencies such as respiratory distress, anaphylaxis, sepsis, dehydration, and supraventricular tachycardia?
    - No.

23. How do you document events during an office emergency (assigned role, tape recorder, retrospective, other)?
    - No formal emergency documentation protocol.

24. How do you and your staff maintain skills and readiness? (Examples include attending nursery deliveries, moonlighting in urgent care or pediatric ED, being a PALS or APLS instructor, holding regular mock office codes and scavenger hunts for infrequently used equipment, providing expert review of pediatric runs for your local EMS, or other.)
    - We don't.

25. How do you document parent education, staff training, protocols, and stocking for emergencies?
    - We don't.

26. What is your risk-management company's policy regarding emergency preparedness of your office?
    - Unknown

27. Are there other aspects of your office practice that you think could be improved to achieve fewer office emergencies and better outcomes.
    - See informal survey results.

Appendix I

Office Preparedness Checklist Too

Aims:
Order and strategically stock 90% of emergency supplies and equipment
Achieve 50% increase in office emergency preparedness according to the AAP Policy Statement for Pediatric Office Emergency Preparedness

		Pre-Assessment	*Post-Assessment*	
Office Emergency Equipment and Supplies	Priortiy (Essenetial/ Suggested)	Present in Office (Yes =1; No =0; N/A)	Present in Office (Yes =1; No =0; N/A)	Strategically Stocked (Y=1; N=0)
Airway management				
Oxygen-delivery system	E			
Bag-valve-mask (450 and 1000 mL)	E			
Clear oxygen masks, breather and nonrebreather, with reservoirs (infant, child, adult)	E			
Suction device, tonsil tip, bulb syringe	E			
Nebulizer (or metered-dose inhaler with spacer/mask)	E			
Oropharyngeal airways (sizes 00–5)	E			
Pulse oximeter	E			
Nasopharyngeal airways (sizes 12–30F)	S			
Magill forceps (pediatric, adult)	S			
Suction catheters (sizes 5–16F) and Yankauer suction tip	S			
Nasogastric tubes (sizes 6–14F)	S			
Laryngoscope handle (pediatric, adult) with extra batteries, bulbs	S			
Laryngoscope blades (0–2 straight and 2–3 curved)	S			
Endotracheal tubes (uncuffed 2.5–5.5; cuffed 6.0–8.0)	S			
Stylets (pediatric, adult)	S			
Esophageal intubation detector or end-tidal carbon dioxide detector	S			
Vascular access and fluid management				
Butterfly needles (19–25 gauge)	S			
Catheter-over-needle device (14–24 gauge)	S			
Arm boards, tape, tourniquet	S			
Intraosseous needles (16 and 18 gauge)	S			
Intravenous tubing, microdrip	S			
Miscellaneous equipment and supplies				
Color-coded tape or preprinted drug doses	E			
Cardiac arrest board/backboard	E			
Sphygmomanometer (infant, child, adult, thigh cuffs)	E			
Splints, sterile dressings	E			
Automated external defibrillator with pediatric capabilities	S			
Spot glucose test	S			
Stiff neck collars (small/large)	S			
Heating source (overhead warmer/infrared lamp)	S			
Drugs				
Oxygen	E			
Albuterol for inhalationb	E			
Epinephrine (1:1000)	E			
Activated charcoal	S			
Antibiotics	S			
Anticonvulsant agents (diazepam, lorazepam)	S			
Corticosteroids (parenteral/oral)	S			
Dextrose (25%)	S			
Diphenhydramine (parenteral, 50 mg/mL)	S			
Epinephrine (1:10 000)	S			
Atropine sulfate (0.1 mg/mL)	S			
Naloxone (0.4 mg/mL)	S			
Sodium bicarbonate (4.2%)	S			
Fluids				
Normal saline solution or lactated Ringer's solution S	S			
(500-mL bags)	S			
5% Dextrose, 0.45 normal saline (500-mL bags)	S			
Policies and protocols				
Regular self-assessment of the office (at least yearly)				
Presence of plans for emergency response				
Maintain emergency equipment, including process and checklist for checking that items are working, not expired, and available				
Maintain emergency medications, including process and checklist for checking that items are working, not expired, and available				
Identified individual (or individuals) who maintains equipment and medications				
Conduct regular emergency drills and/or practice (at least yearly)				
Standardized process of contacting EMS and providing essential information about patient and location				
Standardized process of contacting local ED and providing essential information about transferred patient				
Written protocols for emergency response				

	Pre-Assessment	Post-Assessment	Percent Change
Percentage of Supplies:			
Percentage of Medications:			
Percentage of Policies			
Percentage of Total Items:			

Results	
Total numbers of Emergency Equipment Expected to be present and stocked:	
Total number of Emergency Equipment Items Present:	
Total number of Emergency Equipment Items Stocked	
Percentage of Emergency Equipment Present in Office:	
Percentage of Emergency Equipment Stocked:	

Appendix I. Office Preparedness Checklist Tool

Appendix J

Pediatrics

Policy and Procedure for Emergency Preparedness and Emergency Response

Definitions

Emergency: *An emergency is defined as a person identified to have no pulse, no respirations, is unconscious OR experiencing severe medical distress/signs and/or symptoms that signal a life-threatening condition.*

ALS: Advanced Life Support
BLS: Basic Life Support

EMS: Emergency Medical Services

Closed-loop communication

Periods of High Staffing: Monday- Friday 9am-5pm

Periods of Low Staffing: Weekends, holidays, and weekdays between 8:30am-9am, weekdays between 5pm-5:15pm

Non-clinical staff members: Includes the office manager and front desk staff.

Clinical- staff members: Includes Physicians, Nurse Practitioners (NP), Registered Nurses (RN) and Medical Assistants (MA)

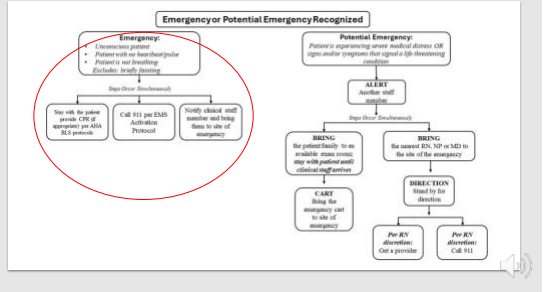
RECEPTION DESK EMERGENCY CARD

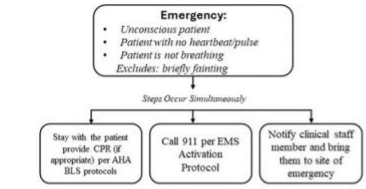
The following signs and symptoms may signal an emergency:

- Extremely labored breathing
- Blue or pale color (cyanosis)
- Noisy breathing (wheezing or stridor)
- Altered mental status
- Seizure
- Agitation (in the parent
- Vomiting after a head injury
- Uncontrolled bleeding

If you feel a patient has symptoms that may signal an emergency, immediately alert the nearest available RN, NP or MD.

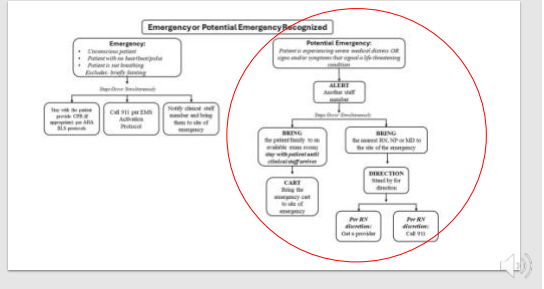
Recognition of an Emergency





Emergency

This process also applies to ANY suspected emergency in a non-patient (including guardians)



Potential Emergency?

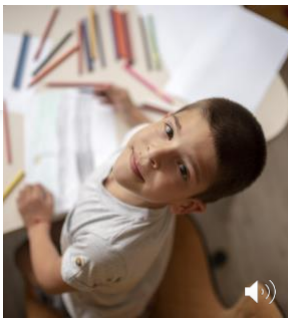
RECEPTION DESK EMERGENCY CARD
The following signs and symptoms may signal an emergency:
- Extremely labored breathing
- Blue or pale color (cyanosis)
- Noisy breathing (wheezing or stridor)
- Altered mental status
- Seizure
- Agitation (in the parent
- Vomiting after a head injury
- Uncontrolled bleeding

If you feel a patient has symptoms that may signal an emergency, immediately alert the nearest available RN, NP or MD.

Scenario

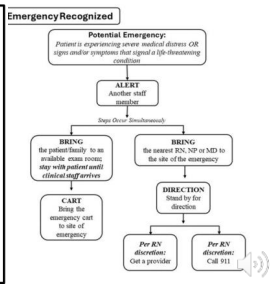
Potential Emergency?

NO



RECEPTION DESK EMERGENCY CARD
The following signs and symptoms may signal an emergency:
- Extremely labored breathing
- Blue or pale color (cyanosis)
- Noisy breathing (wheezing or stridor)
- Altered mental status
- Seizure
- Agitation (in the parent
- Vomiting after a head injury
- Uncontrolled bleeding

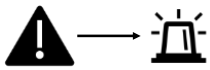
If you feel a patient has symptoms that may signal an emergency, immediately alert the nearest available RN, NP or MD.

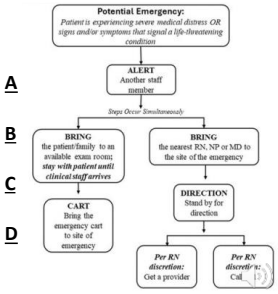


Recognition of a Potential Emergency

patient *experiencing severe medical distress OR signs and/or symptoms that signal a* ***life-threatening condition***

Role of Non-Clinical Staff

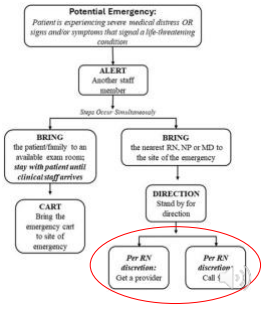


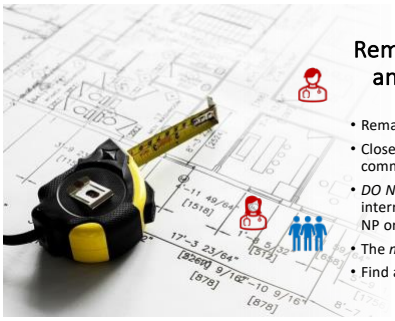


Recognition of a Potential Emergency:

Role of Clinical Staff

- Immediate triage
- **RN:**
  - If it is a true emergency stay with patient and instruct staff to interrupt provider
  - RN discretion: Instruct staff to activate EMS if appropriate





Reminders during an emergency

- Remain calm
- Closed-loop communication
- *DO NOT WAIT* to interrupt any physician, NP or RN
- The *nearest* provider
- Find an exam room

During an Emergency:
Staff Communication, Roles, and Responsibilities
Periods of high-staffing

1. Team Leader
2. First Assistant
3. EMS Activator
4. Recorder

Additional Front Desk Staff -> Remain calm and assist families

Office manager -> Delegate printing of "demographics sheet"

Printing a Demographics Sheet

- Open patient chart in chart review -> the chart will open in the "Peds snapshot" tab.
- Click on School/Camp/Sports
- Right click in the blank space next to "Patient information" and click "Print."

Recorder

- Ideally, an RN
- Document in real time
- Copy for EMS
- Retain a copy

Activating EMS

DO NOT DELAY CALLING 911

Call 911

CALLING EMS FOR AN OFFICE EMERGENCY

- ☐ Call 9-1-1
- ☐ Be ready to give the emergency medical dispatcher the following information:
  - Age and condition of child (with vital signs, if appropriate)
  - Office Locations and Directions
  - Level of clinical staff present (e.g. MD, NP, RN, MA)
  - Where personnel will be meeting them to assist in guiding EMS to location of the child

Emergency Scenario: Periods of Low Staffing

Weekends: 1 provider + 1 clinical staff + 1 front desk staff

Emergency or Potential Emergency Recognized

Emergency:
- *Unconscious patient*
- *Patient with no heartbeat/pulse*
- *Patient is not breathing*
- *Excludes: briefly fainting*

Follow BLS protocols
Note: in this scenario it may be most appropriate to call for help; the goal is treat the patient while activating 911 as fast as possible

Potential Emergency:
Patient is experiencing severe medical distress OR signs and/or symptoms that signal a life-threatening condition

Walk family to clinical area and immediately notify clinical staff or provider

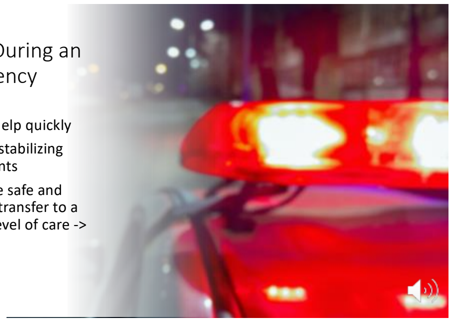
Front Desk staff will remain with clinical staff for any further instructions; e.g. return to front desk or activate EMS

Emergency Scenario:
No Provider in the Office

- Notify the nearest RN and immediately call 911
- RN will serve as the team leader and provide care to the patient within the scope of their practice (e.g. BLS) until EMS arrives
- A staff member should attempt to get a provider on the phone to help direct care as needed
  - To contact a provider, *call the cell phone of the provider on call*

Goals During an Emergency

- Obtain help quickly
- Provide stabilizing treatments
- Facilitate safe and prompt transfer to a higher level of care -> Call 911



Organization of Emergency Equipment

AED

- Mounted on the wall on the corner in front of room 8
- Keep equipment bag attached

Emergency Cart

- Organized according to patient size/age

Scavenger Hunt

Emergency Maintenance and Checks

- Emergency Equipment and Medication Checks
  - RN's Monthly check form
    - Present
    - Stocked
    - Not expired
  - Office Manager Quarterly Review of Check Forms
- If equipment is found to be missing, expired or in need of maintenance immediately notify the office manager
- OM will facilitate replacement or maintenance

Monthly Equipment and Medication Checks

Office Emergency Equipment and Supplies		
Year:	January	
Emergency Cart	Present	Expiration
Cardiac arrest board/backboard		
Oxygen Tank		
Color-coded tape or preprinted drug doses		
Top of Cart		
Oropharyngeal airways (sizes 00–5)		
Nasopharyngeal airways (sizes 12–30F)		
Preprinted drug doses		
Sterile dressings		
Epi Pen Adult (0.3mg/0.3mL)		
Epi Pen Child (0.15mg/0.3ml)		
Glucometer		
Glucometer Strips		
Pulse Oximeter: Adult		Working? Y / N
Pulse Oximeter: Child		Working? Y / N
Adult Drawer		
Ambu Bag 1000mL		
Magill Forcep- Adult		
Non-rebreather adult/adolescent		
Blood Pressure Cuff: Adult		
Child Drawer		
Ambu Bag 1000mL		
Magill Forceps: Child		
Non-rebreather child		
Blood pressure Cuff: Child		
Infant Drawer		
Ambu Bag 450mL		
Magill Forcep: Infant		
Non-rebreather infant		
Bulb syringe		
Blood Pressure Cuff: Infant		
Bottom of Cart		
Stiff neck collars (small/large)		
Medications (In Lab)		
Albuterol neb solution		
DuoNeb solution		
Ceftriaxone		
Dexamethasone		
Wall Mounted		
AED		
Emergency Package Attached to AED		

American Heart Association.

CPR Certification

- All staff will maintain a current BLS CPR certification
- Office manager will maintain a copy of each staff member's CPR certification card
  - *It is the responsibility of each staff member to ensure their CPR certification remains up to date.*
- Scheduled trainings every other year
- Cost of BLS certification covered if prior arrangements made with OM

In-situ Simulation or "Mock Codes"

- Mock codes will be conducted twice yearly.
- Attend two "mock-code" simulations yearly.
- Simulations will include a pre-briefing, simulation, and debriefing.
- Each staff member will have a defined role for the simulation that is reflective of their role in the office.
- The simulation will also include a recorder role.
- ***Simulation for learning purposes only***

Notes about Simulation

- The intention of Mock Code/Simulation **is self-reflection and learning**
- Performance at the mock codes:
  - will NOT be used for any other purposes other than a learning experience
  - will NOT be used in performance evaluations or affect a person's role in the office
- *It is expected that all staff members participate respectfully and maintain the confidentiality of other participants.*

Safe Simulation

Safe environment:
To learn
To practice
To make mistakes
To discuss feedback openly and honestly

Goals:
Self-Reflection
Learning
NOT Assessment

Ground Rules

"Fiction Contract"

Simulation Components

Pre- Briefing ⟶ Simulation ⟶ Debriefing

Questions or Concerns

Appendix K

Prebriefing Script

Hi everyone, thank you all for coming to this simulation today, aka "mock code."

I will start us off today with a discussion of the format of today's simulation. We are going to start with a prebriefing which is what I am doing now, then we will move to the simulation and finally the debriefing. I've allotted approximately 10 minutes for each portion of today's simulation. I would like to note that the last part, the debriefing, is the most important part of the simulation today, so it is important that everyone stay for the entire process. We will debrief in 3 parts, first we will talk about how we felt about the scenario & recap what happened, we will analyze what happened and then connect it to our future practice.

At the end of the debriefing, I'm asking everyone to fill out a *completely anonymous*, quick, evaluation that is very important to me for evaluating how things went through this process of making our office more prepared for emergencies. I would be very grateful if everyone could please take a few minutes to fill out that evaluation.

To start, I'd like to clarify my role as a facilitator of this simulation. My role is not to evaluate performance but to help facilitate a discussion and self-reflection. I expect you to do most of the talking, raise questions, identify issues and volunteer your perspectives.

I would like to make it very clear that we are not evaluating your performance in the simulation as a marker of your ability to do your job or of your clinical knowledge. Anything that happens in simulation will not be used in your performance evaluations. There are certain things that are going to happen in simulation and what happens to the patient is not a reflection on your practice. Today, is strictly about learning and practice.

As such, I would like to establish this as a safe place to practice. It is expected that during simulation things will not go perfectly, mistakes will be made, issues will arise, and the beauty of simulation is that it is a low-risk scenario, as patients are not involved, patients cannot get hurt. So we can practice now for things that may happen in our real practice and identify issues now so that we can address them before they come up in real practice. I am calling these "latent safety threats," these are things we did not know may be a problem and if we identify them today it is valuable to us. So please speak up.

Some ground rules and expectations:

- Simulation is confidential- what happens here we are not talk about this later
- Treat others respectfully. Recognize that we are not actors on Broadway and simulation is inherently uncomfortable, emotional response is an important part of the learning process, but it is not always easy. Please do not laugh at anyone.
- I'm asking everyone to "suspend disbelief" not everything today will be realistic. Pretend it is.

Does anyone have any questions before I talk about how this is going to work?

I have #_____ actors today who have been instructed on the scenario and how they are to act.

Patient:

I have discussed with _____ that they are okay with being the patient…

Parent:

EMS 1:
EMS 2:

The scenario is this is a NEW Patient acute visit, 8-year-old Jane is presenting to our office in severe respiratory distress, she has a history of asthma.

So let's talk about the goals for today's simulation.

- Correctly identify a potential emergency vs. actual emergency and execute the appropriate algorithm
- Practice using closed-loop communication
- Activate EMS promptly using our office protocol
- Provide appropriate treatment to our patient while waiting for EMS to arrive

Start: This scenario is going to start when a parent walks up to the front desk to check in their child in the waiting room. Front desk staff will be sitting at their typical place within the office.

Ends: Once EMS is called, I will start the timer. Our response time for EMS arrival is about 5 minutes. EMS will arrive at the end of our 5-minute timer. When EMS arrives and receives report the scenario ends.

During the scenario to obtain physical exam information: perform the physical exam (e.g. auscultate lungs or place O2 sensor, BP cuff, temperature, etc.) and then state out loud "general survey," "lung sounds" or "oxygen sat" and I will provide them to you. If my actors have a question, they do not know the answer to I will also provide them to you.

DO get the emergency cart, use oxygen tubing but do not turn on the oxygen tank for real or open the ambu bags. Exam room to use for this scenario is Room ____

I need volunteers for the following roles: *it should correspond to your role in the office.*
Provider:
RN 1:
RN 2: (if needed)
Front Desk first point of contact:
Front Desk second point of contact:
Please try to stay in character until the scenario ends. If you are too uncomfortable at any point for any reason, please let me know and you can of course become a spectator.

Appendix L

Simulation Scenario

Simulation Scenario

Section 1: Case Summary

Scenario Title:	8-year-old asthma exacerbation
Keywords:	*Asthma, respiratory distress, pediatric primary care*
Brief Description of Case:	*8-year-old asthma exacerbation presenting to pediatric primary care in severe respiratory distress*

Goals and Objectives	
Educational Goal:	*Execute office protocol for potential emergencies*
Objectives: (Medical and CRM)	☐ Correctly identify potential emergency ☐ Follow potential emergency algorithm ☐ Utilize closed-loop communication ☐ Activate EMS promptly using office protocol ☐ Provide appropriate treatment to patient while waiting for EMS to arrive
EPAs Assessed:	

Learners, Setting and Personnel				
Target Learners:	☐ Junior Learners	☐ Senior Learners	☐ Staff	
	☐ Physicians	☐ Nurses	☐ RTs	☒ Inter-professional
	☐ Other Learners:			
Location:	☐ Sim Lab	☒ In Situ	☐ Other:	
Recommended Number of Facilitators:	Instructors:			
	Sim Actors:			
	Sim Techs:			

Scenario Development	
Date of Development:	May 25, 2024
Scenario Developer(s):	Kaitlin Patel Idea for this scenario taken from AAP Scenario Samples in: American Academy of Pediatrics (2007). Preparation for emergencies in the offices of pediatricians and pediatric primary care providers. Pediatrics. 120(1):200–212.
Affiliations/Institutions(s):	University of Massachusetts Boston
Contact E-mail:	
Last Revision Date:	
Revised By:	
Version Number:	

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Simulation Scenario

Section 2A: Initial Patient Information

A. Patient Chart			
Patient Name: Jane Smith	**Age:** 8	**Gender:** Female	**Weight:** 26kg
Presenting complaint: wheezing, rhinorrhea			
Temp: 99.3F	**HR:** 150bpm	**RR:** 40bpm	**O_2Sat:** 85%
Triage note: *New patient acute. WCV scheduled in 1 month. Mom reports patient has been wheezing for 2 days with upper respiratory infection but worsened this afternoon; told mom before she was brought into the office that she has been giving herself puffs of her inhaler every half hour most of the day.*			
Allergies: Peanuts			
Past Medical History: Moderate Asthma *Admission 6 months ago status asthmaticus* Seasonal allergies Eczema		**Current Medications:** Albuterol 90mcg/actuation inhaler Q4HRS PRN QVAR 80mcg/actuation twice daily Zyrtec 10mg PO daily Hydrocortisone 2.5% ointment BID PRN apply to eczematous areas Epipen 0.15mg/0.3ml autoinjector PRN for anaphylaxis	

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Simulation Scenario

Section 2B: Extra Patient Information

A. Further History

Include any relevant history not included in triage note above. What information will only be given to learners if they ask? Who will provide this information (mannequin's voice, sim actors, SP, etc.)?
 	
Asthma History:
• **Medication Adherence:**
  ○ *"Well, her QVAR inhaler is very expensive, it's like $200, because we have a high-deductible health plan. She ran out about 3 months ago and she was doing well so we did not think she needed it. I paid to pick it up at the pharmacy yesterday when she started wheezing"*
• **Hospitalizations:**
  ○ *"She has had a bad year with her asthma since we moved here from California. We have been to the Emergency Room 3 times and last time she was hospitalized, about 6 months ago for her asthma. It was really scary; they were talking about putting a breathing tube in but then she turned the corner."*
• **Specialist Collaboration:**
  ○ *"We saw the pulmonologist at the hospital before she was discharged but her follow up appointment is not for 2 more weeks. We are also supposed to see an allergy doctor in a couple of months."*
• **Childhood Asthma History:**
  ○ *"She has always had problems with asthma, usually after she gets a cold. But since we moved things seem worse. I don't know if it is our apartment building? Or the new environment outside? We have a lot of carpet, and our neighbor has a cat."*
When did her symptoms start?
"A week ago she developed a fever to 101F that lasted less than 24 hours, but she had a runny nose for a few days. The cough started 3 or 4 days ago but the wheezing only started 2 days ago."
How is she sleeping?
"The last two nights she was up a lot coughing"
How often has she been using her albuterol?
"Well, were using it every 4 hours the last couple of days and it did initially seem like it was helping. I let her stay home today so we could come to this appointment, and I could watch her. I was working from home for the morning and when I went to check on her, she looked like she was having more trouble breathing and was only able to say a few words, so we drove over here a little early. On the way over she told me she started to feel worse while I was working so she took her inhaler from the kitchen cabinet and has been giving herself puffs in between every new episode of her show this morning- like every 30 minutes. I never would have let her use it that much"

B. Physical Exam	
List any pertinent positive and negative findings	
Cardio: *Tachycardic, regular rate and rhythm, no murmurs, rubs or gallops*	**Neuro:** *Awake, appears tired, nods head yes or no, occasionally one word uttered*
Resp: *Tachypneic, appears to be in severe respiratory distress, scalene retractions noted with suprasternal indrawing, audible wheezing heard without stethoscope, upon auscultation patient has decreased lung sounds throughout with minimal air entry throughout, some faint inspiratory and expiratory wheezes heard in upper lobes bilaterally*	**Head & Neck:** *Atraumatic, scalene retractions*
Abdo: *Flat, soft*	**MSK/skin:** *Face appears ashen, MAES, tripod positioning*

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Simulation Scenario

Section 3: Technical Requirements/Room Vision

A. Patient
☐ Mannequin (*specify type and whether infant/child/adult*)
☒ Standardized Patient
☐ Task Trainer
☐ Hybrid

B. Special Equipment Required
Oxygen Oxygen Tubing Nebulizer Pulse Oximeter

C. Required Medications
Albuterol or Duo Neb Dexamethasone PO

D. Moulage
N/A

E. Monitors at Case Onset
☐ Patient on monitor with vitals displayed ☒ Patient not yet on monitor

F. Patient Reactions and Exam
Include any relevant physical exam findings that require mannequin programming or cues from patient (e.g. – abnormal breath sounds, moaning when RUQ palpated, etc.) May be helpful to frame in ABCDE format.

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Simulation Scenario

Section 4: Sim Actor and Standardized Patients

Sim Actor and Standardized Patient Roles and Scripts	
Role	*Description of role, expected behavior, and key moments to intervene/prompt learners. Include any script required (including conveying patient information if patient is unable)*
Patient	*Nods head yes or no. Leans forward. Appears breathless.*
Parent	*Arrives to front desk to check in patient. States- "We are here for our appointment early, my daughter can't breathe"* *Appears worried throughout. Provides history.*
EMS	*2 Arrive to scene.* *One person asks: Hi, I'm _____, I can take report.* *Other person asks: Do you have registration information?*

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Simulation Scenario Template

Section 5: Scenario Progression

Scenario States, Modifiers and Triggers				
Patient State/Vitals	Patient Status	Learner Actions, Modifiers & Triggers to Move to Next State		Facilitator Notes
Arrival	*Helped into office by mother siting in chair in waiting room, severe resp distress, unable to speak more than 1 word, Tripod position, appears tired*	***Expected Learner Actions*** ☐ Recognize a "Potential Emergency" ☐ Alert another staff member ☐ Bring the patient and family to exam room ☐ Another staff member brings a clinical staff member and stands by ☐ Staff member obtains emergency cart	**Modifiers** *Changes to patient condition based on learner action* ☐ *None* **Triggers** *For progression to next state* ☐ *Provider arrives*	
Triage Rhythm: RRR HR: 150 BP: 90/60 RR: 40 O_2SAT: 85% T: 99.3F GCS: 15	*Alert, severe resp distress, unable to speak more than 1 word, appears tired, almost sleepy*	***Expected Learner Actions*** ☐ Obtain history ☐ Check vital signs ☐ Obtain nebulizer ☐ Admin albuterol or DuoNeb ☐ Activate EMS	**Modifiers** *Changes to patient condition based on learner action* ☐ Do not add oxygen ☐ Add oxygen **Triggers** *For progression to next state* ☐ 10 min after nebulizer is added	
Activate EMS		☐ Activate EMS ☐ ☐ Call 9-1-1 ☐ ☐ Age and condition of child (with vital signs, if appropriate) ☐ ☐ Your office location ☐ ☐ Level of clinical staff present (e.g. MD, NP, RN, MA) ☐ ☐ Where personnel will be meeting them to assist in guiding EMS to location of the child		

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Simulation Scenario Template

Nebulizer, No O2 Rhythm: RRR HR: 158 BP: 90/60 RR: 36 O_2SAT: 84% T: 99.4F GCS: 15	*Alert, severe resp distress, unable to speak more than 1 word, **appears sleepier, eyes flutter closed;** Lung sounds decreased throughout, increased insp/exp wheeze throughout*	Expected Learner Actions ☐ Administer oxygen ☐ *Admin dexamethasone*	**Modifiers** **Triggers**	
Nebulizer, With O2 Rhythm: RRR HR: 145 BP: 90/60 RR: 36 O_2SAT: 89% T: 99.4F GCS: 15	*Alert, mod resp distress, Lung sounds decreased throughout, increased insp/exp wheeze throughout*	Expected Learner Actions ☐ Reassurance Provided	**Modifiers** **Triggers** - *EMS arrives*	
EMS arrives		Expected Learner Actions ☐ Patient report sheet printed for EMS ☐ EMS hand off from provider	**Modifiers** N/A **Triggers** - *EMS hand off ends scenario*	

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Simulation Scenario Template

Section 6: Simulation Materials

To Provide to Provider and RN in scenario

A. Patient Chart			
Patient Name: Jane Smith	**Age:** 8	**Gender:** Female	**Weight:** 26kg
Presenting complaint: wheezing, rhinorrhea			
Temp:	**HR:**	**RR:**	**O_2Sat:**
Triage note: *New patient acute. WCV scheduled in 1 month.*			
Allergies: Peanuts			
Past Medical History: Moderate Asthma *Admission 6 months ago status asthmaticus* Seasonal allergies Eczema	**Current Medications:** Albuterol 90mcg/actuation inhaler Q4HRS PRN QVAR 80mcg/actuation twice daily Zyrtec 10mg PO daily Hydrocortisone 2.5% ointment BID PRN apply to eczematous areas Epipen 0.15mg/0.3ml autoinjector PRN for anaphylaxis		

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Simulation Scenario Template

History from Parent

Initial triage history:
Jane has been wheezing for 2 days with upper respiratory infection but worsened this afternoon; told me before she was brought into the office that she has been giving herself puffs of her inhaler every half hour most of the day.
 	
Asthma History:
• **Medication Adherence:**
  ○ *"Well, her QVAR inhaler is very expensive, it's like $200, because we have a high-deductible health plan. She ran out about 3 months ago and she was doing well so we did not think she needed it. I paid to pick it up at the pharmacy yesterday when she started wheezing"*
• **Hospitalizations:**
  ○ *"She has had a bad year with her asthma since we moved here from California. We have been to the Emergency Room 3 times and last time she was hospitalized, about 6 months ago for her asthma. It was really scary; they were talking about putting a breathing tube in but then she turned the corner finally."*
• **Specialist Collaboration:**
  ○ *"We saw the pulmonologist at the hospital before she was discharged but her follow up appointment is not for 2 more weeks. We are also supposed to see an allergy doctor in a couple of months."*
• **Childhood Asthma History:**
  ○ *"She has always had problems with asthma, usually after she gets a cold. But since we moved things seem worse. I don't know if it is our apartment building? Or the new environment outside? We have a lot of carpet, and our neighbor has a cat."*
 	
When did her symptoms start?
"A week ago she developed a fever to 101F that lasted less than 24 hours, but she had a runny nose for a few days. The cough started 3 or 4 days ago but the wheezing only started 2 days ago."
 	
How is she sleeping?
"The last two nights she was up a lot coughing"
 	
How often has she been using her albuterol?
"Well, were using it every 4 hours the last couple of days and it did initially seem like it was helping. I let her stay home today so we could come to this appointment, and I could watch her. I was working from home for the morning and when I went to check on her, she looked like she was having more trouble breathing and was only able to say a few words, so we drove over here a little early. On the way over she told me she started to feel worse while I was working so she took her inhaler from the kitchen cabinet and has been giving herself puffs in between every new episode of her show this morning- like every 30 minutes. I never would have let her use it that much"

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Appendix C: Facilitator Cheat Sheet & Debriefing Tips

Include key errors to watch for and common challenges with the case. List issues expected to be part of the debriefing discussion. Supplemental information regarding any relevant pathophysiology, guidelines, or management information that may be reviewed during debriefing should be provided for facilitators to have as a reference.

References

1. American Academy of Pediatrics (2007). Preparation for emergencies in the offices of pediatricians and pediatric primary care providers. Pediatrics. 120(1):200–212.
2. Sawicki, G., Haver, K. (2023). Acute asthma exacerbations in children younger than 12 years: Overview and home/office management and severity assessment. In: UpToDate, Wood, R.A., Redding, G. (Ed), Wolters Kluwer. (Accessed on May 25, 2024.)

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Appendix M

Post-Implementation Survey

Please Rate the Following:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
During this training and simulation:					
I learned things that increased my knowledge about how to respond to an emergency in our office.	1	2	3	4	5
I gained skills that I will use if an emergency occurs in the office.	1	2	3	4	5
After this training and simulation:					
I feel more confident that I understand my role during an emergency than I did prior to the training and simulation.	1	2	3	4	5
I feel more comfortable responding to an emergency than I did prior to the training and simulation.	1	2	3	4	5
I feel more knowledgeable about which emergency equipment is stocked in the office than I did prior to this training and simulation.	1	2	3	4	5
I feel more confident in my ability to locate emergency equipment and materials quickly than I did prior to the training and simulation.	1	2	3	4	5
Overall:					
The goal of the training was to provide training on our office policy and procedure for responding to emergencies. I feel this training effective in meeting this goal.	1	2	3	4	5
The goal of the simulation was to provide all staff the opportunity to practice responding to an emergency. I feel this simulation was effective in meeting this goal.	1	2	3	4	5
I feel the simulation added value to this learning experience. (***value added=*** enhanced or made more effective).	1	2	3	4	5

Appendix M. Post-Implementation Survey

Appendix N

Measures Table

		Measures			Analysis
Aim or Objectives	**Outcomes/ outputs**	**How operationalize/ measure**	**Where will you get the information**	**Will you have a comparison?**	**Analysis**
Gather input from at least two people from all disciplines (Physicians, RN, front desk staff) for emergency plan development.	Obtainment of input on emergency equipment needs and emergency policy and procedure development from every discipline and leadership	Formal and informal conversations with stakeholders regarding policy and procedure development The obtainment of input from two persons from each discipline	Communication Records	N/A	Qualitative data from communication records: evidence of input, themes and suggestions
Collaborate with clinical and non-clinical staff to develop a practice-specific emergency preparedness policy and procedure and plan for training/simulation including debriefing and post-test	Developed office-based emergency preparedness policy and procedure that is reflective of input from all disciplines Developed plan and content for office-based video training and simulation Developed plan for in-situ simulation including pre-briefing content, simulation cases and debriefing content	Utilize qualitative data from communication records, on-going as needed inquiries to staff and recommendations from the AAP Policy statement to develop policy and procedure and plan The completion in development of the office-specific policy and procedure.	Qualitative data derived from communication records and meeting minutes. AAP Policy Statement of Office Based Emergency Preparedness Literature Review Studies containing data and tools regarding in-situ simulation processes	N/A	Qualitative data: evidence of input from staff members, incorporated suggestions in a fully developed policy and procedure
Order and strategically stock 90% of emergency supplies and equipment required for policy and procedure	All emergency equipment and supplies required in policy and procedure will be available and stocked strategically (by size) for ease of access and use during a clinical emergency	Utilize equipment and supply checklist to order all necessary items Organize strategically within the office in a manner that appropriately sized items can be grabbed during a pediatric emergency Utilize supply checklist to ensure 90% compliance	Developed emergency policy and procedure AAP Policy Statement	Pre/Post assessment of emergency preparedness checklist	Frequency and proportion of stocked items
70% of staff will obtain BLS for healthcare providers CPR certification	70% of staff will be certified in CPR BLS for healthcare providers	Staff complete CPR training and present certification cards Number of staff that obtain CPR certification	Number of CPR certification cards collected compared to staff list	Number of staff certified in CPR BLS for healthcare providers prior	Frequency and proportion

Implement a combination asynchronous video training implementing new emergency policy and procedure and in-person simulation	75% completion of asynchronous video emergency preparedness training 75% of staff attendance at in-situ simulation including pre-briefing/debriefing and post-test survey	At a pre-determined time, conduct training and simulation followed by post-test survey Number of staff that participated in intervention	Developed office specific policy and procedure Developed plan for training & simulation Debriefing Post-intervention survey	N/A	Frequency and proportion: calculate proportion of staff who attended
Conduct post-intervention debriefing with post-test for 75% of clinical and non-clinical staff	75% of staff will participate in post-implementation survey and debriefing 75% of staff will participate in debriefing	Assess level of participation Take notes on feedback during debriefing and	Debriefing meeting notes Post-intervention surveys	N/A	Frequency and proportion: assess number of staff that participated in intervention against number of staff in office Qualitative data: feedback on in-situ simulation, any latent safety threats that were identified
75% of staff will self-report affirmative responses on post-implementation survey	Staff will self-report an increase in staff knowledge and comfort in managing emergencies, locating emergency equipment and that training and simulation were effective and that the simulation added value to the training	Reported increase in knowledge and comfort on post-intervention survey data	Post-intervention survey	Comparison questions will be asked in post-test survey (e.g., compared to pre-training levels how comfortable do you feel…?)	Analyze post-test data to determine whether increase in knowledge & comfort was achieved
Achieve 50% increase in office emergency preparedness according to the AAP Policy Statement for Pediatric office emergency preparedness	Increased office preparedness for emergencies according to the AAP Policy Statement for emergency office preparedness	Perform office preparedness checklist: that assesses presence of components of emergency plans and availability of specific equipment and supplies pre and post intervention Checklist completed and scores calculated and compared	AAP Policy Statement Pre/Post checklist	Pre/Post checklist	Comparison of pre/post intervention preparedness checklist scores and calculation of improvement

Appendix N. Measures Table

Appendix O

Quality Improvement Checklist

Date: 3/30/2023	**Project Leader: Kaitlin Patel**	
Project Title: Development and Implementation of an Emergency Preparedness Policy and Procedure, Educational Intervention, and In-situ Simulation in a Pediatric Primary Care Office: A Quality Improvement Project		
Institution where the project will be conducted: Pediatric Primary Care Office		
Instructions: Answer YES or NO to each of the following statements about QI projects.	**YES**	**NO**
The specific aim is to improve the process or deliver of care with established/ accepted practice standards, or to implement change according to mandates of the health facilities' Quality Improvement programs. There is no intention of using the data for research purposes.	**X**	
The project is **NOT** designed to answer a research question or test a hypothesis and is **NOT** intended to develop or contribute to generalizable knowledge.	**X**	
The project does **NOT** follow a research design (e.g., hypothesis testing or group comparison [randomization, control groups, prospective comparison groups, cross-sectional, case control]). The project does **NOT** follow a protocol that over-rides clinical decision-making.	**X**	
The project involves implementation of established and tested practice standards (evidence-based practice) and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	**X**	
The project involves implementation or care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	**X**	
The project has been discussed with the QA/QI department where the project will be conducted and involves staff who are working at, or patients/clients/individuals who are seen at the facility where the project will be carried out.	**X**	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research**.**	**X**	
The clinical practice unit (hospital, clinic, division, or care group) agrees that this is a QI project that will be implemented to improve the process or delivery of care.	**X**	
The project leader/DNP student has discussed and reviewed the checklist with the project Course Faculty. The project leader/DNP student will **NOT** refer to the project as research in any written or oral presentations or publications.	**X**	
ANSWER KEY: If the answer to **ALL** of these questions is **YES**, the activity can be considered a Clinical Quality Improvement activity that does not meet the definition of human research. **UMB IRB review is not required**. **Keep a dated copy of the checklist in your files.** If the answer to ANY of these questions is NO, the project must be submitted to the IRB for review.		

Appendix O. Clinical Quality Improvement Checklist

Appendix P

Informal Discussion Results

Aim:	***Gather input from at least two people from each discipline (Physicians, RN/MA, front desk staff) for emergency plan development***			
Questions:	*What types of medical emergencies have you experienced in the office?*	*What knowledge or skills do you think would be important for you or other staff members to learn to improve our ability to adequately and safety to respond to an emergency?*	*What equipment should be available during an emergency that is not currently available in the office?*	*What policies and/or procedures do you think should be established in our office in the event of an emergency?*
Physician (1)	☐ Toxic Shock Syndrome ☐ Respiratory failure	☐ Be able to find emergency equipment readily ☐ Feel comfortable using emergency equipment	☐ Backboard for CPR ☐ AED	☐ Rapid/Response or Code Blue Protocol ☐ How to alert others to an emergency ☐ How alert when someone is sick and needs quicker eval (rapid response) vs true emergency where all hands need to be available and there is need to alert other physicians PRN
Physician (2)				
MA (1) *		☐ CPR	☐ Light system to notify for emergency ☐ AED	☐ Call tree: i.e. who notifies who
RN (1) *	☐ Fainting		☐ O2 tanks ☐ Oral glucose ☐ CPR board ☐ Better eye wash station ☐ Pull shower	
RN (2)				
Front Desk Staff (1)	☐ Low oxygen levels, patient not improved after nebulizer treatments ☐ Fainting ☐ One child fainted and struck their head	☐ CPR	☐ AED ☐ Fire Exits	☐ What we would need to get through syncope: We have everything set up: apple juice & water in the room ☐ Maybe smelling salts?
Front Desk Staff (2) ^	*In agreement with answers from other staff in conversation*	*In agreement with answers from other staff in conversation*		
Front Desk Staff (3) ^	☐ Baby with breathing trouble and we called EMS	☐ CPR ☐ Basic techniques & warning signs for emergencies: e.g. like signs of strokes or major issues or if someone comes in with a weapon	☐ Defibrillator	☐ What to do if you see an emergency ☐ How to handle an emergency in general ☐ Do we interrupt someone in an exam room-? MD? NP? RN?; ☐ Who to notify, who/when to call 911 ☐ What if there is one person or two people in the office ☐ What is our role during an emergency ☐ The worst thing about an emergency is that you're not prepared and people panic and nothing gets done, if there is a plan then you'll know what to do.

**conducted together*
^conducted together

Appendix P. Informal Discussion Results

Appendix Q

Completed Office Preparedness Checklist Tool

Aims:
Order and strategically stock 90% of emergency supplies and equipment
Achieve 50% increase in office emergency preparedness according to the AAP Policy Statement for Pediatric Office Emergency Preparedness

		Pre-Assessment	*Post-Assessment*		
	Priortiy (Essential/ Suggested)	Present in Office (Yes =1; No =0; N/A)	Present in Office (Yes =1; No =0; N/A)	Strategically Stocked (Y=1; N=0)	Needed
Office Emergency Equipment and Supplies					
Airway management					
Oxygen-delivery system	E	1	1	1	1
Bag-valve-mask (450 and 1000 mL)	E	0	1	1	1
Clear oxygen masks, breather and nonrebreather, with reservoirs (infant, child, adult)	E	1	1	1	1
Suction device, tonsil tip, **bulb syringe** **determined only bulb syringe necessary*	E	0	1	1	1
Nebulizer (or metered-dose inhaler with spacer/mask)	E	1	1	1	1
Oropharyngeal airways (sizes 00–5)	E	0	1	1	1
Pulse oximeter	E	1	1	1	1
Nasopharyngeal airways (sizes 12–30F)	S	0	1	1	1
Magill forceps (pediatric, adult) **(added infant)*	S	0	1	1	1
Suction catheters (sizes 5–16F) and Yankauer suction tip	S				
Nasogastric tubes (sizes 6–14F)	S				
Laryngoscope handle (pediatric, adult) with extra batteries, bulbs	S				
Laryngoscope blades (0–2 straight and 2–3 curved)	S				
Endotracheal tubes (uncuffed 2.5–5.5; cuffed 6.0–8.0)	S				
Stylets (pediatric, adult)	S				
Esophageal intubation detector or end-tidal carbon dioxide detector	S				
Vascular access and fluid management					
Butterfly needles (19–25 gauge)	S	1	1	1	1
Catheter-over-needle device (14–24 gauge)	S				
Arm boards, tape, tourniquet	S				
Intraosseous needles (16 and 18 gauge)	S				
Intravenous tubing, microdrip	S				
Miscellaneous equipment and supplies					
Color-coded tape or preprinted drug doses	E	0	0	0	1
Cardiac arrest board/backboard	E	0	1	1	1
Sphygmomanometer (infant, child, adult, thigh cuffs)	E	1	1	1	1
Splints, sterile dressings %	E	1	1	1	1
Automated external defibrillator with pediatric capabilities	S	0	1	1	1
Spot glucose test	S	1	1	1	1
Stiff neck collars (small/large)	S	0	1	1	1
Heating source (overhead warmer/infrared lamp)	S				
Equipment and Supplies Totals		8	16	16	17
Drugs					
Oxygen	E	1	1	1	1
Albuterol for inhalationb	E	1	1	1	1
Epinephrine (1:1000)	E	1	1	1	1
Activated charcoal	S				
Antibiotics	S	1	1	1	1
Anticonvulsant agents (diazepam, lorazepam)	S				
Corticosteroids (parenteral/oral)	S	1	1	1	1
Dextrose (25%)	S				
Diphenhydramine (parenteral, 50 mg/mL)	S				
Epinephrine (1:10 000)	S				
Atropine sulfate (0.1 mg/mL)	S				
Naloxone (0.4 mg/mL)	S				
Sodium bicarbonate (4.2%)	S				
Fluids					
Normal saline solution or lactated Ringer's solutions (500-mL bags)	S				
5% Dextrose, 0.45 normal saline (500-mL bags)	S				
Drugs (Medications Totals)		5	5	5	5
Policies and protocols					
Regular self-assessment of the office (at least yearly)		0	1		1
Presence of plans for emergency response		0	1		1
Maintain emergency equipment, including process and checklist for checking that items are working, not expired, and available		0	1		1
Maintain emergency medications, including process and checklist for checking that items are working, not expired, and available		0	1		1
Identified individual (or individuals) who maintains equipment and medications		0	1		1
Conduct regular emergency drills and/or practice (at least yearly)		0	1		1
Standardized process of contacting EMS and providing essential information about patient and location		0	1		1
Standardized process of contacting local ED and providing essential information about transferred patient		0	1		1
Written protocols for emergency response		0	1		1
Policies and Proedures Totals		0	9		9
All Totals		13	30		31

	Pre-Assessment	Post-Assessment	Percent Change
Percentage of Emergency Equipment Items:	47%	94%	47%
Percentage of Medications:	100%	100%	0%
Percentage of Policies	0%	100%	100%
Percentage of Total Items:	42%	97%	55%

Results	
Total numbers of Emergency Equipment Expected to be present and stocked:	17
Total number of Emergency Equipment Items Present:	16
Total number of Emergency Equipment Items Stocked	16
Percentage of Emergency Equipment Present in Office:	94%
Percentage of Emergency Equipment Stocked:	94%

Appendix Q. Completed Office Preparedness Checklist Tool

Appendix R

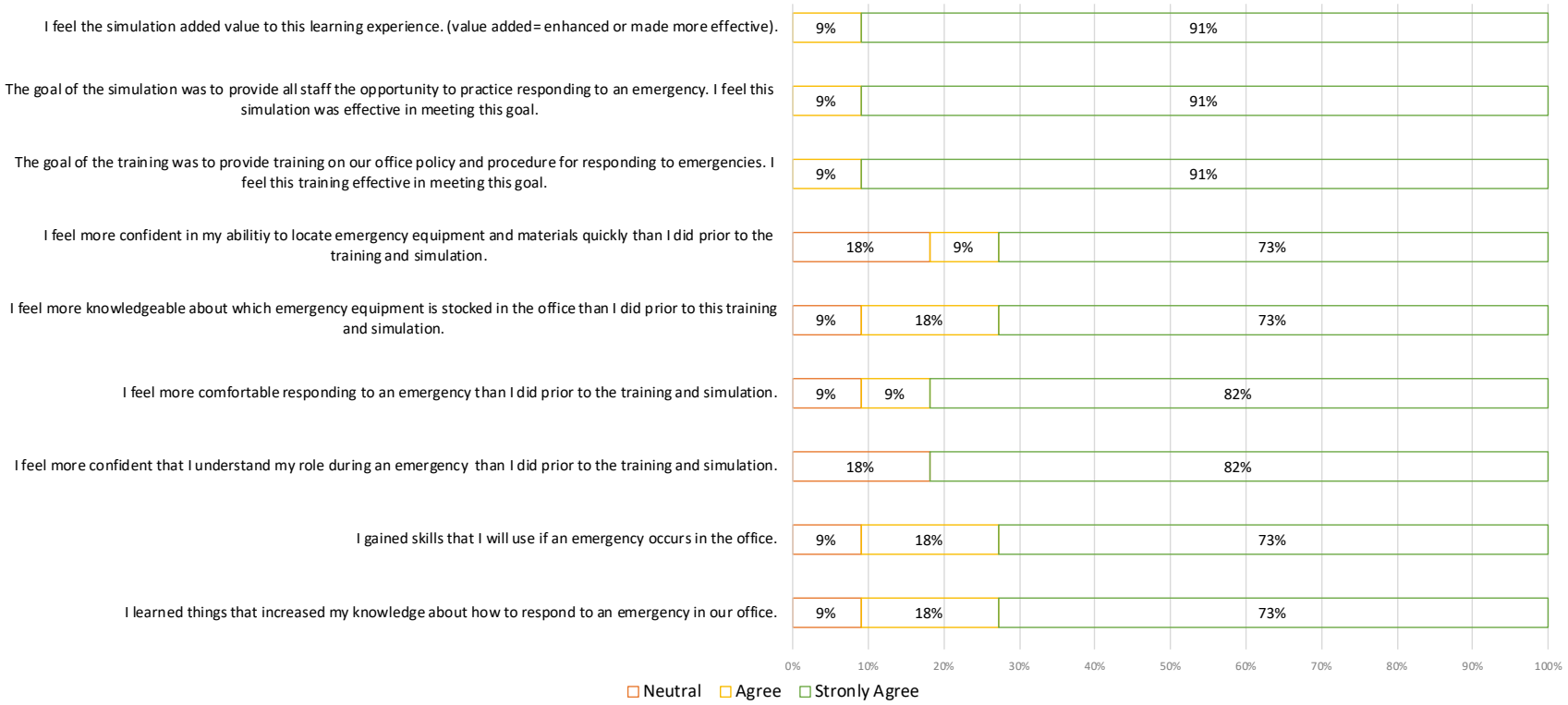
Post Implementation Survey Responses

Post Implementation Survey Responses									
Questions ->	I learned things that increased my knowledge about how to respond to an emergency in our office.	I gained skills that I will use if an emergency occurs in the office.	I feel more confident that I understand my role during an emergency than I did prior to the training and simulation.	I feel more comfortable responding to an emergency than I did prior to the training and simulation.	I feel more knowledgeable about which emergency equipment is stocked in the office than I did prior to this training and simulation.	I feel more confident in my abilitiy to locate emergency equipment and materials quickly than I did prior to the training and simulation.	The goal of the training was to provide training on our office policy and procedure for responding to emergencies. I feel this training effective in meeting this goal.	The goal of the simulation was to provide all staff the opportunity to practice responding to an emergency. I feel this simulation was effective in meeting this goal.	I feel the simulation added value to this learning experience. (***value added=*** enhanced or made more effective).
Respondent 1:	5	5	5	5	5	5	5	5	5
Respondent 2:	3	3	3	3	4	4	5	5	5
Respondent 3:	4	4	3	4	3	3	4	4	4
Respondent 4:	4	4	5	5	4	3	5	5	5
Respondent 5:	5	5	5	5	5	5	5	5	5
Respondent 6:	5	5	5	5	5	5	5	5	5
Respondent 7:	5	5	5	5	5	5	5	5	5
Respondent 8:	5	5	5	5	5	5	5	5	5
Respondent 9:	5	5	5	5	5	5	5	5	5
Respondent 10:	5	5	5	5	5	5	5	5	5
Respondent 11:	5	5	5	5	5	5	5	5	5
Average of Responses	4.64	4.64	4.64	4.73	4.64	4.55	4.91	4.91	4.91
Number of "4's and 5's"	10	10	9	10	10	9	11	11	11
Percentage of affirmative Responses	90.91%	90.91%	81.82%	90.91%	90.91%	81.82%	100.00%	100.00%	100.00%

Appendix S. Post Implementation Survey Responses

Appendix S

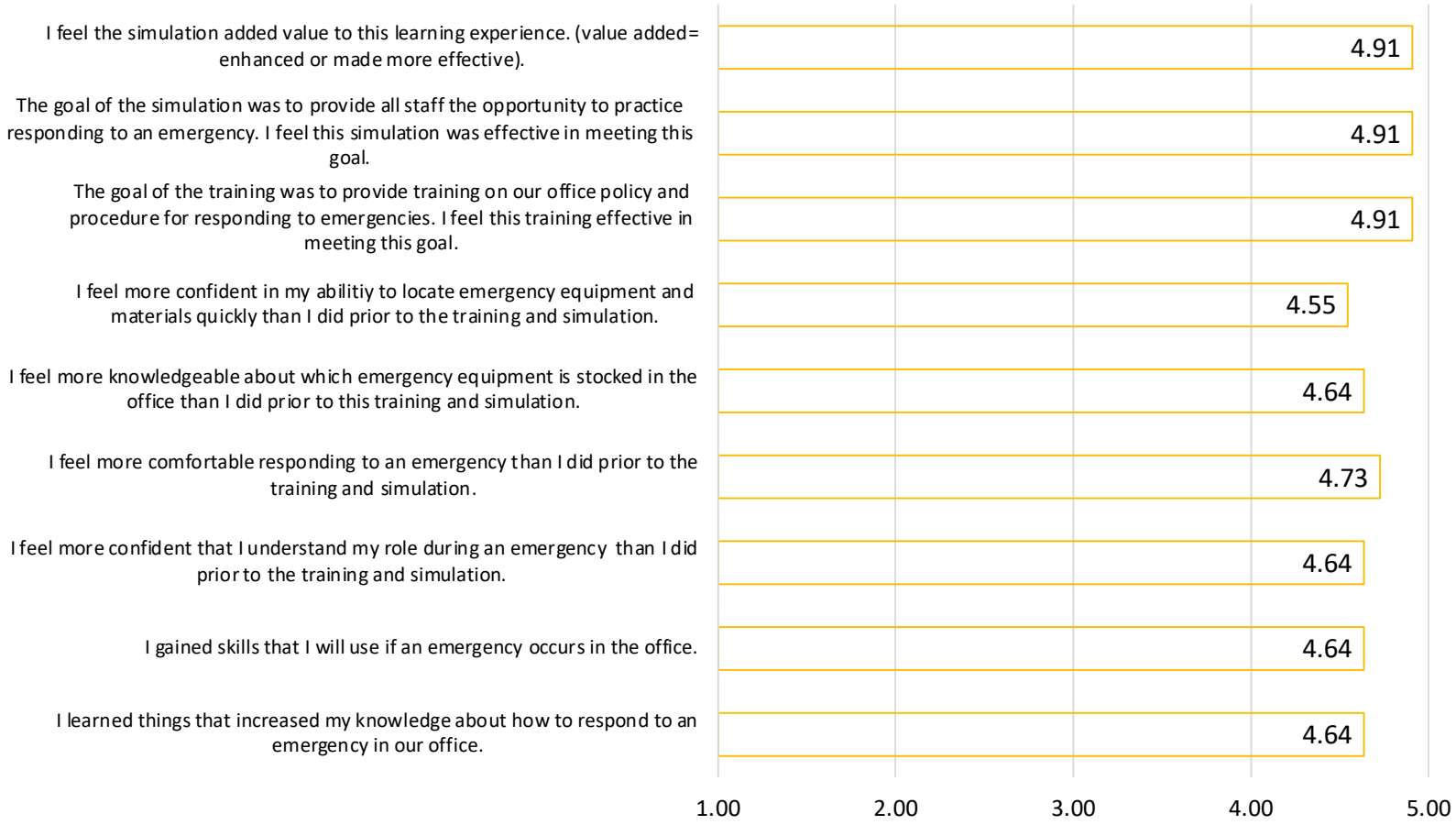
Post-Implementation Survey Breakdown of Survey Results



Appendix S. Post-Implementation Survey Responses as Percentages

Appendix T

Average Responses to Post-Implementation Survey Questions



Appendix T. Average Responses to Post-Implementation Survey Questions

Appendix U

Breakdown of Costs

Emergency Equipment and Supplies	*Quantity Purchased*	*Cost per Item*	*Total Cost to Office (pre-tax)*
AED including pediatric key, Wall Cabinet, Wall sign, CPR kit (CPR mask, razor, gloves, etc.) Includes ($500 off sale price)	1	$1,585.00	$1,585.00
Emergency Cart (included CPR board)	1	$233.24	$233.24
Oropharyngeal airway set (sizes 00–5)	1	$15.99	$15.99
Nasopharyngeal airways (sizes 12–30F)	1	$27.97	$27.97
Calculator	1	$5.83	$5.83
Pulse Oximeter: Adult	1	$42.62	$42.62
Pulse Oximeter: Child	1	$42.71	$42.71
Ambu Bag 1000mL	2	$16.03	$32.06
Ambu Bag 450mL	1	$11.69	$11.69
Magill Forceps- Adult	2	$5.57	$11.14
Magill Forceps: Child	2	$5.57	$11.14
Magill Forceps: Infant	2	$5.57	$11.14
Bulb syringe	3	$0.85	$2.55
Blood Pressure Cuff: Adult	1	$27.08	$27.08
Stiff neck collar (adult)	1	$6.74	$6.74
Stiff neck collar (pediatric)	1	$6.74	$6.74
Stiff neck collar (infant)	1	$4.61	$4.61
		Total for AED	$1,585.00
		Total for Crash Cart	$233.24
		Total for Additional Equipment and Supplies	$260.01
		Total for CPR Certification	$504.00
		Total Cost	$2,582.25

Appendix U. Breakdown of Costs

Appendix V

Project Process Notes

Gathering Input

In December of 2023, this project commenced by gathering input through informal conversations with staff from all disciplines that were represented in the office including physicians, nurses, and front-desk office staff. Data was gathered from during informal discussions by asking the following questions:

1. What types of medical emergencies have you experienced in the office?
2. What knowledge or skills do you think would be important for you or other staff members to learn to improve our ability to adequately and safety to respond to an emergency?
3. What equipment should be available during an emergency that is not currently available in the office?
4. What policies and/or procedures do you think should be established in our office in the event of an emergency?

Participants were advised that their answers to the questions were anonymous in that their names would not be listed in the write up regarding these discussions and this information would solely be utilized for acquisition of knowledge and perspectives. Informal surveys were conducted during downtime and in various locations throughout the office. To facilitate increased participation, some informal discussions were conducted in small groups. Verbal responses were written down by the project lead on paper and then transferred to the informal discussions data management tool (Appendix P). Some participants did not have answers to

questions that were asked, in which case the box was left blank. When conducting group sessions, many participants agreed with their colleagues' answers.

Policy and Procedure Development

After obtaining input from all disciplines, a practice-specific policy and procedure was drafted. Office policy and procedure development followed the recommendations listed in the American Academy of Pediatrics (2007) policy statement *Preparation for emergencies in the offices of pediatricians and pediatric primary care providers*. These recommendations can be found in Appendix G. As recommended, the project lead first completed a self-assessment of preparedness for pediatric emergencies, which is a series of questions taken from Appendix 1 of the American Academy of Pediatrics' (2007) policy statement. As it was designed, this self-assessment served to help identify areas of opportunity to increase emergency preparedness within the office. The completed self-assessment of office readiness is found in Appendix Q. This assessment required that the project lead collaborate with local EMS leadership. To accomplish this, the project lead e-mailed the local fire department leadership and received a return call to discuss local EMS response times and pediatric-specific factors, like equipment availability, that may impact EMS response. Knowledge of office-specific EMS response times guided decisions on levels of equipment needed for the office. Specifically, the decision was made to not have advanced airway equipment or intravenous access capabilities given that the office will not need to stabilize a patient for more than about 5 minutes prior to EMS arrival and local EMS carries all the necessary pediatric-sized equipment for emergency response.

Next, the project lead created headings within the policy document for each recommended subject within the AAP (2007) policy statement. The project lead then designed office-specific procedures to address each of the headings and included all recommended aspects

of information that were relevant for our office setting. The policy and procedure document was developed and reviewed with the site mentor in February of 2024 prior to submission for review amongst office physician stakeholders. The site mentor submitted the policy and procedure for physician review on March 8, 2024, which was approved shortly after, following minor revisions. The completed policy and procedure can be found in Appendix F (office-specific information has been redacted).

Emergency Supplies and Equipment

Prior to commencement of ordering and strategic stocking of emergency equipment within the office, the project lead first met with the site mentor to review which equipment and medications are appropriate for the office to stock and maintain. To accomplish this, the project lead utilized the Office Preparedness Checklist Tool (Appendix I) in discussion with the site mentor to evaluate whether each individual item was necessary or unnecessary and recorded the determination this within the tool. The Office Preparedness Checklist Tool was adapted from Abulebda, K., Yuknis, M. L., Whitfill, T., & Montgomery, E. E. (2021). Preparedness for Pediatric Office Emergencies: A Multicenter, Simulation-Based Study. *Pediatrics, 148*(3), 65–74. https://doi.org/10.1542/peds.2020-038463, the information for these checklists were taken directly from the AAP (2007) Policy statement. Items that were determined to be unnecessary for the office were grayed out within the tool; this is visible in the Completed Office Preparedness Checklist Tool located in Appendix I. The site mentor and project lead also agreed that the best method for stocking emergency equipment in the office would be in the form of a mobile emergency cart in which equipment could be maintained and moved to the site of an emergency when needed.

After determining which items were necessary for the office to stock, the project lead completed the pre-assessment checklist to determine which items were already available in the office and which items needed to be ordered. Over the course of the next few months, the project lead collaborated with the office manager and the registered nurse who routinely orders office equipment to order the necessary emergency equipment for the office.

In December of 2023, the project lead researched AED's online that would be suitable for the office taking into consideration initial cost, maintenance costs, ease of use, storage and that the AED needs to be appropriate to treat both pediatric and adult patients. The project lead submitted their top choices for AED purchase to the site mentor and reviewed the attributes, benefits and downsides of each AED as applicable to our office. The site mentor and project lead agreed on which AED to order. The project lead worked with the office manager to order the approved AED in a package which included a wall mounted lock box, AED carrying case, infant/child key to change the AED to pediatric mode, CPR pack including a CPR mask, and wall signage for the office. The office also opted to purchase training pads for the AED so it can be utilized in training mode. A family member of the office staff was able to install the AED lockbox in a central location within the office at no cost.

In January of 2024, the project lead researched online for a suitable emergency cart for the office and submitted their proposed choice to the site mentor who approved the purchase. Considerations for which cart to purchase included cost, mobility, size and simplicity. The emergency cart was shipped to the office and assembled by the project lead. The emergency cart contains three removable drawers that were labeled: infant, child and adult. As emergency equipment arrived at the office the project lead strategically stocked equipment within the cart. In the event of an emergency, clinical staff can remove the appropriate drawer that corresponds

to the size/age of their patient and have access to appropriately sized oxygen tubing, Magill forceps, bulb syringes (for infants), and an ambu bag. A complete set of sizes of oropharyngeal airways and nasopharyngeal airways as well as child and adult sized pulse oximeters and sterile dressings are maintained, in line of sight, on the top of the cart. The top of the cart also houses the recorder sheet and monthly check sheets (example in Appendix W). The bottom of the cart houses adjustable infant, pediatric and adult cervical collars. The locations of equipment and medications are documented on the Monthly Check Sheets. Each month, office staff will complete checks of all emergency equipment and document expiration dates. The staff member completing the check is required to notify the office manager if any equipment or medications are missing or expired, ensuring that office preparedness is maintained. Photos of the emergency cart are shown in Figure 3. During the post-intervention phase of the project the project lead completed the post-assessment column of the Office Preparedness Checklist Tool (Appendix I) to determine which pieces of equipment, medication, and policies and protocols were available and, if relevant, strategically stocked within the office.

CPR Certification

It was determined that CPR certification for staff members would be best accomplished by staff members completing asynchronous online training followed by an in-person skills check off. The project lead held and in-office meeting to review with staff that CPR certification is now a requirement for all office staff and to discuss how CPR certification would be maintained. Written instructions on how to register for online training were provided to staff in a mass e-mail. Each staff member registered for the American Heart Association's online HeartCode BLS training. At the time of registration, HeartCode BLS training cost $36 per person, which the office funded. The project lead reached out to the local fire department regarding skills check

off, which must be conducted by a certified BLS instructor. The local fire department was able to send a CPR instructor to the office to complete our skills check-off which effectively completed our staff's certification. The skills check off was at no cost to the office and offered gratis by the local fire department.

To facilitate HeartCode training completions, in the setting of staff's heavy workloads, the office manager facilitated coverage for staff to temporarily step away from their normal roles and paid staff to complete the training during hours that the office was closed if needed. The day of skills check off, staff completed the skills session with the instructor as either individuals or in small groups. A schedule was made ahead of time to strategically free up staff for their allotted skills session and facilitate other staff covering their positions during this time. Physicians were scheduled during the office lunch break. The CPR instructor was able to utilize the office's newly purchased AED with the purchased training pads to orient staff to the office's particular AED. During the four hours that the CPR instructor was in the office, a total of 12 staff successfully completed skills check off.

Asynchronous Training

Once the office policy and procedure was approved, the project lead created a narrated PowerPoint that reviewed the office policy and procedure in detail. The training also introduced the concepts of in-situ simulation and safe simulation. The narrated PowerPoint was approved for dissemination by the site mentor. The PowerPoint slides for the office training are available in Appendix J. In May of 2024, the PowerPoint was converted into a video and loaded onto a shared drive accessible by all staff. An e-mail was sent notifying staff that they should watch the video with instructions on how to access it. Two lunch-time viewings were also scheduled in which the project lead set up the video to play the break room during lunch time for any staff

members who could attend. Multiple nurses attended one scheduled viewing while all other staff members watched the video independently. Staff were paid for time spent viewing the training video. Participation in the asynchronous training was recorded.

Simulation

In May of 2024, preparations were made for the in-situ simulation within the office. The project lead wrote a prebriefing script that followed guidance from *The 3D model of debriefing: defusing, discovering, and deepening* by Zigmont et al. (2011). The pre-briefing served to orient participants to the components of the simulation, introduce the post-implementation survey, establish the project lead's role as the facilitator, explain the purpose of simulation and make it clear to participants that their performance in simulation will not be reflected in performance reviews. The pre-briefing also established ground rules for simulation, goals for the specific simulation and explained how to proceed through the simulation including how to obtain exam information as well as begin and end the simulation. The pre-briefing script is available in Appendix K.

The project lead researched for simulation scenarios that were already developed but was unable to find a simulation scenario that was appropriate for the office capabilities and addressed the desired goals for the simulation. Therefore, the project lead developed a simulation scenario. The choice of simulation scenario was guided by responses from the informal survey in which multiple staff members reported they had experienced children in the office in respiratory distress. The AAP (2007) policy statement offered ideas for simulation scenarios that offices can practice; a scenario was adapted from these recommended scenarios. The project lead used a scenario template from EM Sim Cases to develop the scenario, the subject of which was an 8-year-old child experiencing an asthma exacerbation and presenting to the pediatric primary care

office in respiratory distress. The developed scenario is located in Appendix L. Utilizing the guidance from *The 3D model of debriefing: defusing, discovering, and deepening* by Zigmont et al. (2011) the project lead developed a debriefing worksheet to utilize during the debriefing which is available in Appendix X.

In May of 2024, the project lead conducted the in-situ simulation during a lunch hour. Staff were notified of the date of the simulation approximately one week ahead of time. The date of the simulation was chosen for a day of the week where most staff were scheduled to be in the office and the number of patients scheduled was not overwhelming to staff. The simulation was rescheduled one time due to time constraints that developed on the original date the simulation was scheduled. Overall, the entire prebriefing, simulation and debriefing with post-implementation survey took approximately 30 minutes. Attendance at the in-situ simulation as well as participation in the debriefing and completion of the post-implementation survey was tracked.

Post-Implementation Survey

Paper copies of the post-implementation survey (Appendix M) were handed out to participants following the completion of the debriefing. To ensure confidentiality of the survey, the project lead left the area after distributing post-implementation surveys and the respondents dropped their anonymous surveys in a box once completed. Respondents notified the office manager once they completed the surveys, and the office manager notified the project lead once all surveys were completed.

Appendix W

Monthly Emergency Check Sheets

Office Emergency Equipment and Supplies										
Year:	January		February		March		April		May	
Emergency Cart	Present	Expiration	Present	Expiration	Present	Expiration	Present	Expiration	Present	Expiration
CPR Board										
Oxygen Tank		Tank Full? Y / N		Tank Full? Y / N		Tank Full? Y / N		Tank Full? Y / N		Tank Full? Y / N
Oxygen Reference Card										
Top of Cart										
Oropharyngeal airways (sizes 00–5)										
Nasopharyngeal airways (sizes 12–30F)										
Sterile gauze										
Calculator										
Coband										
Tape										
Pulse Oximeter: Adult		Working? Y / N		Working? Y / N		Working? Y / N		Working? Y / N		Working? Y / N
Pulse Oximeter: Child		Working? Y / N		Working? Y / N		Working? Y / N		Working? Y / N		Working? Y / N
Adult Drawer										
Ambu Bag 1000mL										
Magill Forcep- Adult										
Non-rebreather adult/adolescent										
Blood Pressure Cuff: Adult										
Child Drawer										
Ambu Bag 1000mL										
Magill Forceps: Child										
Non-rebreather child										
Blood pressure Cuff: Child										
Infant Drawer										
Ambu Bag 450mL										
Magill Forcep: Infant										
Non-rebreather infant										
Bulb syringe										
Blood Pressure Cuff: Infant										
Bottom of Cart										
Stiff neck collar (infant)										
Stiff neck collar (pediatric)										
Stiff neck collar (adult)										
Lab										
Equipment										
Glucometer		Working? Y / N		Working? Y / N		Working? Y / N		Working? Y / N		Working? Y / N
Glucometer Strips										
Nebulizer		Working? Y / N		Working? Y / N		Working? Y / N		Working? Y / N		Working? Y / N
Medications										
Epi Pen Adult (0.3mg/0.3mL)										
Epi Pen Child (0.15mg/0.3ml)										
Albuterol neb solution										
DuoNeb solution										
Ceftriaxone										
Dexamethasone										
Wall Mounted										
AED		Green light Flashing? Y / N		Green light Flashing? Y / N		Green light Flashing? Y / N		Green light Flashing? Y / N		Green light Flashing? Y / N
Emergency Package Attached to AED										
AED Pads										
Pediatric Key										
Signature of person completing										

Appendix W. Monthly Emergency Check Sheets

Appendix X

Debriefing Worksheet

Post-experience analysis

Created with information taken verbatim from:

Zigmont, J. J., Kappus, L. J., & Sudikoff, S. N. (2011). The 3D model of debriefing: defusing, discovering, and deepening. *Seminars in perinatology*, *35*(2), 52–58. https://doi.org/10.1053/j.semperi.2011

Defusing: *Prompt discussion surrounding the emotional impact of the experience on the learners and the description of the event and how it unfolded.*

- Discuss emotions to *reduce anxiety, acknowledge feelings and clear the slate for learning*
- Recap events *to achieve shared understanding:*
  - *facts of recap of events*
  - *participants may identify gaps in clinical knowledge*
- Conduct needs assessment *of key points for discussion*

How did it feel to be a part of that scenario?	*Notes:*
Let's recap WHAT happened during that scenario so that we can then discuss WHY during the second part of the debriefing.	*Notes:*

Discovering: *To analyze and evaluate performance through reflection. To discover mental models or rationale for specific behaviors through inquiry. To identify gaps/matches between existing and targeted mental models.*

Goals:

(1) to facilitate learner's engagement in reflective observation on their own performance

(2) to prompt abstract conceptualization of new information to build or enhance one's mental model.

- *Identify an observed behavior or outcome*
- *Ask a question to discover the mental model guiding that action*
- *Cue Individual to make/identify analogy connection to Target Mental Model*

What do we think went well? **_____, I noticed that you _____ in this situation.** **I was curious about that action because…** **Can you tell me why you did __....** **Thanks for sharing… has anyone else experienced this?**	*Notes:*
What do you think could have gone better? **Another way to handle ____ is to _____** **If we had done _____** **How would that change _____**	*Notes:*

Deepening: *To apply lessons from simulation and make connections to clinical practice.*

If you were to encounter a similar situation in the future, how would you handle it?	*Notes:*
How can we use what we learned today in our clinical practice? **Do any changes need to be made to our response?**	*Notes:*

Summary: *To review what was learned throughout the session.*

Highlight the key objectives and lessons learned.	*Notes:*
What is one thing we can take away from this session to use in our practice?	*Notes:*