Emergency Medical Services for Children Program Managers' Role in the Pediatric Readiness Quality Collaborative

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Introduction

Over the last 36 years, the Health Resource and Services Administration (HRSA) Emergency Medical Services for Children (EMSC) program has focused on efforts to ensure that Emergency Medical Services (EMS) systems incorporate the needs of children. To improve pediatric emergency care, it requires a dedicated group of individuals focused on continuous quality improvement and measuring those changes through meaningful data. The National Pediatric Readiness Program (NPRP) 2013-14 assessment was the starting point of measuring pediatric emergency care quality improvement (QI) activities.[i] The NPRP assessment identified gaps and spurred development of QI opportunities at the federal, state and local levels. An example of how NPRP spurred continuous QI work using the NPRP assessment as the framework occurred in Connecticut. The EMSC Program Manager implemented structured QI interventions with 12 community hospitals. After the intervention, the average NPRP assessment score increased 13 points by participating hospitals, showing participation in QI collaboratives was associated with improvements in pediatric readiness.[ii]

In July 2016, to further support QI at the federal, state, and local levels, the HRSA EMSC program funded the EMSC Innovation and Improvement Center (EIIC) to leverage the expertise of multiple professional societies and federal organizations to transform and improve emergency medical care for children across the continuum of pediatric emergency care.[iii] The HRSA EMSC program made this shift in investment strategy to drive improvements further through grassroots QI science methodology. The EIIC constructed the Pediatric Readiness Quality Collaborative (PRQC) project to help EMSC State Partnership Program Managers in their work to support hospital QI efforts, and to accelerate emergency department (ED) pediatric readiness through the implementation of defined change strategies.

Emergency Medical Services for Children (EMSC) Program

In 1984, Congress signed into law the federal EMSC program. The EMSC program is administered by the Health Resources and Services Administration (HRSA) within the U.S. Department of Health and Human Services. The HRSA EMSC program mission is to expand and improve emergency medical services for children who need treatment for trauma or critical illness, with a guiding vision to improve survival and health outcomes among children and adolescents who experience medical emergencies or traumatic injuries. It is the only federal program charged with ensuring all children and adolescents—no matter where they live, attend school, or travel—receive appropriate emergency medical care. The HRSA EMSC program supports EMSC State Partnership programs in all U.S. states and territories as they work with emergency departments (EDs) and prehospital Emergency Medical Services (EMS) systems to provide the right care, in the right place, at the right time for each

The purpose of this paper is to provide a brief overview of the PRQC project, while demonstrating how QI collaboratives can be effective strategies for improving pediatric emergency care. Pediatric QI collaboratives also provide mechanisms for increasing the foundation of support, as well as visibility of state and U.S. territory EMSC programs. The paper will also demonstrate the importance and evolving role of EMSC Program Managers in the successful implementation of the PRQC project. The Oregon, Alaska, and Wisconsin EMSC Program Managers, who actively supported and participated in the PRQC project, will share strategies utilized to ensure project success, lessons learned, and next steps to foster pediatric readiness.

Pediatric Readiness Quality Collaborative (PRQC) Background

The NPRP 2013-14 Assessment identified important gaps in the readiness of EDs to provide care to children.[i] The PRQC project was developed to address these identified gaps. From January 2018 through June 2020, the PRQC project brought together a wide-reaching group of 146 hospitals across 17 states, with varying levels of participation. Hospitals were divided into 16 teams, which collectively represented approximately 5% of annual U.S. pediatric ED visits.[iv]

The goal of the PRQC project was to demonstrate the effectiveness of QI methods and strategies to improve pediatric emergency care, and to collectively improve participating hospitals' pediatric readiness scores by 10 points.[v] QI is associated with increased pediatric readiness by as much as 26 points. However, QI was also a significant gap identified during the 2013-14 NPRP survey. Fewer than 50% of EDs had a QI plan that included pediatric specific needs.[vi]

The EIIC used the Institute for Healthcare Improvement's Collaborative Breakthrough Series model and subject matter experts to support the 16 teams with targeted QI education and tools. Each team included trainers from comprehensive medical centers and children's hospitals that manage high volumes of pediatric patients. Local trainers worked with pediatric champions at the participating hospitals to develop and implement QI plans targeting key gaps in pediatric readiness. In order to identify strategies to improve pediatric emergency care delivery, teams were provided opportunities to strategize with QI experts, identify gaps in care, complete needs assessments, create SMART (Specific, Measurable, Achievable, Realistic, and Timely) aims, develop key driver diagrams, and integrate QI tools (e.g., process maps; fishbone diagrams; SWOT (Strengths, Weaknesses, Opportunities, and Threats) analyses; and Plan-Do-Study-Act (PDSA) cycles) (see Appendix A).[vii]

Based on the results of the NPRP 2013-14 Assessment, four intervention bundles and importance statements were developed for the PRQC project (see Figure 1).[viii] The project intervention bundles formed the basis for local and regional QI efforts, directing teams toward change strategies such as refining existing ED guidelines and policies, optimizing features in the electronic medical record (e.g., integrating clinical decision support), educating the care team, and reinforcing knowledge (i.e., just-in-time education).[vii]

Figure 1. NPRP 2013-14 Identified Gaps, PRQC Intervention Bundles and Importance Statements

NPRP 2013-14 Identified Gaps	Four PRQC Intervention Bundles	Importance Statements
67.7% of responding EDs reported weighing children in kilograms.	**Weight in Kilograms:** A patient safety initiative focused on collecting and documenting pediatric patients' weight in kilograms.	Weighing children in kilograms is the first step in the prevention of medication dosing errors.
70.1% of responding EDs reported having a written procedure in place to notify physicians when abnormal vital signs are found in children.	**Abnormal Vital Signs:** Developing a notification process for abnormal vital signs.	Vital signs assessment provides an early warning of changes in patient condition and can assist in preventing deterioration of a pediatric patient.
70.6% of responding EDs reported having written transfer guidelines in place.	**Interfacility Transfer:** Ensuring interfacility transfer guidelines are patient and family centered.	Transfer guidelines maximize available resources and minimize cost and family burden associated with transition of care to another facility.
46.8% of responding EDs reported having a disaster plan that addresses children.	**Pediatric Disaster Preparedness:** Establishing disaster plans that include children.	Children represent 25% of all disaster victims and are disproportionately impacted due to anatomy, physiology, and development.

EMSC Program Quality Improvement and PRQC: EMSC Program Managers' Perspective

EMSC Program QI: EMSC Program Managers' Role

EMSC State Partnership programs are generally housed within the state or U.S. territory Department of Health or EMS offices, however, a few programs are housed in medical schools. Each state and U.S. territory program employs a full-time EMSC Program Manager who oversees day-to-day operations and activities for improving pediatric emergency care and serves as the main point of contact for federal EMSC grant requirements. The specific activities of state and U.S. territory EMSC programs have evolved over time, moving from initially disseminating resources and establishing networks to including more QI specific activities such as data gathering, reporting, analyzing, identifying gaps, and implementing performance improvements to demonstrate progress in HRSA EMSC performance measures.[ix] Program Managers are shifting to a boots-on-the-ground approach and directly supporting healthcare providers and administrators.

PRQC: EMSC Program Managers' Role

The EMSC State Partnership grant requires EMSC Program Managers to participate in QI work, and the PRQC project embodies this requirement. The PRQC project, organized by the EIIC and supported by the National EMSC Data Analysis Resource Center (NEDARC), gave EMSC Program Managers access to high-quality resources vetted by national experts and a data entry system that allowed participating hospitals to visualize and track their PDSA quality cycles. The project structure and data entry system were handled by the EIIC and NEDARC, which allowed EMSC Program Managers to direct their attention to building relationships and supporting hospital participation.

The role of the EMSC Program Manager was a significant contributing factor in the successful implementation of the PRQC project. This was especially evident for the Oregon, Alaska, and Wisconsin teams. Depending on the EMS systems and hospitals participating in the project, the support role of the EMSC Program Manager varied and even evolved throughout the lifecycle of the project. The PRQC project was designed with a remote technical assistance team model, which allowed EMSC Program Managers to fulfill a critical support role.

Oregon EMSC Program Manager's Role

The Oregon EMSC Program Manager was eager to have the Oregon teams selected to participate in the PRQC project because of previous unsuccessful attempts to establish a statewide hospital pediatric readiness recognition program. The hope was that the Oregon EMSC Program would be able to work with hospitals to improve pediatric readiness without facing various roadblocks and concerns from hospital administrators. The PRQC project provided the Oregon EMSC Program Manager an opportunity to invite Oregon and Southwest Washington hospitals to participate in pediatric emergency care QI. Emphasis was placed on the collaborative nature of the national project, which was to be led by the EIIC and supported by NEDARC's data entry system—both being considered neutral parties. Hospitals would be able to enter protected hospital patient care data, allowing for measurement of intervention strategies and improvements. Participation in the project would guide improvement in hospital everyday pediatric readiness.

The PRQC project provided a framework for hospital pediatric readiness and opened a dialogue with Oregon and Southwest Washington hospitals. Without the PRQC project, it is unlikely that the Oregon EMSC Program would have been successful in establishing a pediatric readiness program or implementing a similar quality-focused project. Participating in the PRQC project provided an avenue for the Oregon EMSC Program and participating hospitals to develop relationships, share resources, and support each other across programs, hospital systems, and state borders. The work completed by the Oregon EMSC Program during the PRQC project has fast-tracked the understanding of where each participating hospital is in their pediatric readiness journey, opened the door for following up with each hospital to address identified needs and foster quality improvement efforts, and enhanced hospital provider and administrator awareness of the Oregon EMSC Program.

The Oregon EMSC Program Manager was the driving force behind the PRQC project, and the level of success is due in large part to their persistence and tenacity. The EMSC Program Manager's role evolved beyond the usual day-to-day EMSC Program activities to include many new PRQC project activities. Prior to the PRQC project, contact with hospitals was minimal and mostly centered on NPRP assessments. Active participation in the PRQC project meant taking on new activities, including the initial task of hospital recruitment. From there, the EMSC Program Manager connected with hospitals and training teams through consistent communication, outreach, support, shared resources, and encouragement.

The Oregon EMSC Program Manager's primary recruitment goal was to have wide hospital representation from Oregon and Southwest Washington, which included hospitals with varied levels of pediatric readiness located in both rural and urban areas. The EMSC Program Manager partnered with two members of the Oregon EMSC Advisory Committee, one pediatric intensive care physician from Doernbecher Children's Hospital, and one emergency care physician from Randall Children's Hospital at Legacy Emanuel, to recruit the hospitals. From the recruitment efforts, two Oregon teams were formed and participated in the PRQC project. The first team, *WranglER 4 Kids*, had eight Oregon hospitals within the Providence Health & Services network. Staff from the Providence St. Vincent Medical Center and the Oregon EMSC Program Manager supported the team. The second team, *Oregon Pediatric Readiness Program*, after some attrition, had one Southwest Washington and eight Oregon hospitals from various hospital networks. The Oregon EMSC Program Manager and providers from Doernbecher Children's Hospital and Randall Children's Hospital at Legacy Emanuel supported this team.

As the project developed, additional outreach and support from the Oregon EMSC Program Manager was required. This came in many forms, including but not limited to: monthly team calls, individual hospital calls, virtual and in-person site visits, education sessions focused on quality improvement, patient care, promising practices and research, problem-solving to complete project deliverables, and consistent email communications—while also acting as the "squeaky wheel" and advocating for hospital needs from the EIIC and NEDARC. Approximately eight months into the project, the Oregon EMSC Program Manager established monthly calls with a few EMSC Program Managers with teams participating in the PRQC project. Eventually these calls were extended to include all EMSC Program Managers with PRQC project teams. This was an opportunity for EMSC Program Managers to share what was working, ask questions about project barriers, and provide support to each other as the pediatric readiness path was paved in each state.

Throughout the project, the Oregon EMSC Program Manager gathered resources from supporting pediatric hospitals/training sites, as well as from the hospitals participating in the project. These were shared over email and through a project Dropbox site. In addition to project-specific resources, hospitals also shared their QI experiences and promising practices. Hospital team members became the experts and were able to share what did or did not work from the frontlines of the QI journey. Many team members expressed that the PRQC project gave them the opportunity they had been seeking to focus on pediatric QI.

Ultimately, the Oregon EMSC Program Manager's role was to encourage participating hospitals. Due to the length of the project and unexpected delays in securing the data use agreements and getting the data entry system operational, it meant reaching out and encouraging hospital teams early and often. The Program Manager praised hospital teams for the work they had completed, provided support and

ideas for how to keep team members engaged, and prompted teams to share pediatric readiness success stories.

The Oregon EMSC Program Manager's efforts were rewarded by increased PRQC project participation; new relationships with providers and hospitals; improved pediatric readiness; increased individual, PRQC project team, and hospital investment in pediatric QI; and the development of the new Pediatric Readiness Program.

Alaska EMSC Program Manager's Role

The Alaska EMSC Program Manager supported and assisted the participating hospitals by coordinating the following activities: 1) scheduling regular meetings to discuss progress and next steps; 2) reaching out to EIIC and NEDARC partners if the team had questions; 3) collecting documentation for EIIC and NEDARC; 4) communicating upcoming PRQC events, webinars, and meetings; and 5) sharing pediatric resources and successes.

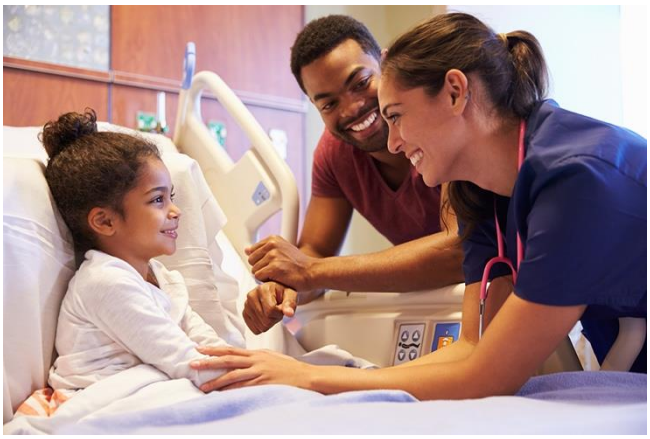
The Alaska EMSC Program Manager's role continued to evolve during the project. In the beginning, much of the work to establish *The Last Frontier Kids* team was performed by the project training site lead physician and head nurse. During that time, the EMSC Program Manager focused on administrative tasks such as attending PRQC Learning Sessions, participating in monthly check-in meetings with other EMSC Program Managers, and travelling to a PRQC in-person training meeting held in Austin, Texas.

Midway through the project, *The Last Frontier Kids* team experienced changes in ED leadership. With these changes, it was necessary for the Alaska EMSC Program Manager to assume an enhanced role, reinvigorate the PRQC project efforts, and pull the team together. The Program Manager arranged an orientation for the new leaders and shared what would be required for successful participation in the PRQC project. This was followed up by frequent calls to team members to support their continued work and to ease the transition of new team members. The Program Manager coordinated teleconferences to introduce new team members to the PRQC project and support *The Last Frontier Kids* team in their effort to rebuild. A communication plan was established with *The Last Frontier Kids*' ED Nurse Manager. The plan included weekly team check-in calls and emails, monthly teleconference calls with EIIC project leads, and quarterly team reports at Alaska EMSC Advisory Committee meetings. A social media group page was also utilized to centralize project updates and ensure important project information could be easily obtained despite the large geographical spread of team members.

Through the PRQC project, the Alaska EMSC Program Manager was able to work alongside a group of QI experts and leaders. The PRQC project brought awareness and visibility to the Alaska EMSC Program, which provided a means for the Alaska EMSC Program to connect with hospital leadership, invite them to participate in the EMSC Advisory Committee meetings, and in some cases become EMSC Advisory Committee members. Relationships were also established with QI experts, and specifically with the pediatric champions who were critical to the success of *The Last Frontier Kids* team.

Prior to the PRQC project, the training hospital had been recognized as a Comprehensive Pediatric Emergency Care Facility through the Alaska Pediatric Facility Recognition Program, but the connections

made during the PRQC project will likely foster opportunities to collaborate on future pediatric readiness projects. The PRQC project increased awareness of the importance of pediatric readiness and will likely lead to the development of new pediatric emergency care best practices.



Wisconsin EMSC Program Manager's Role

In Wisconsin, many emergency departments do not treat pediatric patients with enough frequency to feel confident in their care. ED staff want to provide optimal care for children, but prior to the PRQC project there had not been structured opportunities to improve pediatric readiness. The PRQC project provided an organized and structured means to operationalize the Joint Guidelines for Care of Children in the ED and improve pediatric readiness scores through QI strategies.[x]

The Wisconsin EMSC Program Manager was heavily involved in the recruitment of the eleven hospitals that signed PRQC project DUAs. The Program Manager's existing role as a resource for EDs and the established relationships with ED staff and professional organizations increased the credibility of the PRQC project. The EMSC Program Manager distributed announcements from the EIIC to statewide ED email lists, shared announcements in Wisconsin EMSC newsletters, promoted the project at statewide meetings, addressed questions from EDs, and assured that EDs understood the project requirements.

The Wisconsin EMSC Program Manager was also critical in managing the team, which included members from each participating hospital. The EMSC Program Manager recruited four volunteer trainers for the team, coordinated communication, tracked project deliverables, organized team meetings, scheduled team site visits, and served as the first point of contact for hospital pediatric champions and the EIIC. For the eight of the eleven hospitals that participated in data entry, the EMSC Program Manager monitored the data and offered support to pediatric champions that encountered difficulty in data entry or delays in data collection.

The Wisconsin EMSC Program Manager formally recognized the ED pediatric champions for their participation in the PRQC project through articles published in Wisconsin EMSC newsletters, social media posts, and on the Wisconsin EMSC website. Public recognition was appreciated by pediatric champions, and it further strengthened relationships with EDs while elevating the profile of the Wisconsin EMSC Program.

Lessons Learned

Across the three states of Oregon, Alaska, and Wisconsin, there were many lessons learned. The PRQC teams experienced changes throughout the lifecycle of the project that created stress, including project setbacks, delays in achieving project milestones, priority shifts, and hospital team member turnover. The EMSC Program Managers turned to each other for support, focused on staying positive, and continued to engage with their teams while acknowledging to pediatric champions that the PRQC project was increasing their workload and creating challenges.

Several factors contributed to attrition in PRQC project involvement. The first factor was due to delays in establishing the Data Use Agreements (DUA) between participating hospitals and NEDARC. The DUAs had to be signed by hospital administrators for hospitals to enter data into the PRQC data entry system. For some hospitals, the process took so long that by the time the DUA was marked complete, the ED had already moved on to other priorities and QI projects. The second factor was lack of ED and overall hospital leadership support for the PRQC project. While all sites were required to have a letter of commitment from ED and hospital leadership, changes to leadership in some sites led to a loss of support. EDs with supportive hospital leadership were less likely to drop out of the project. These sites were inclined to review the most patient charts, enter the most data, and move through the most PDSA cycles. The third factor was due to ED personnel changes over the course of the project. Personnel turnover often impeded forward progress because of the time it took the EMSC Program Managers and team members to orient new individuals to their position and the PRQC project. EMSC Program Managers were involved during these transitions and provided updates to the EIIC, checked in regularly with pediatric champions, and continued to build relationships among project trainers and hospital team members.

The EMSC Program Managers were critical in keeping the PRQC project on track. The project trainers were experts in patient care content and hospital quality improvement, but they did not have the bandwidth to take on the project's administrative tasks. Fortunately, the project logistics and administrative duties fit well with the work normally performed by the EMSC Program Managers, which allowed the teams to focus on the QI efforts. This level of involvement by the EMSC Program Managers had the added benefit of being kept informed and engaged.

An early lesson identified was that resource sharing saves time and alleviates workloads. In Oregon, the team stored resources in a Dropbox account, but many team members had difficulty accessing the resources due to hospital network security barriers. The EMSC Program Managers realized quickly that an accessible, central storage location for all QI templates, patient care policies, clinical pathways, online resources, and other open-format materials was crucial in the support of pediatric readiness efforts. An online repository, coupled with a social media application, would allow for the best means of sharing project updates and consistent messaging to team members.

Due to the logistics of covering large geographic areas, travel restrictions, scheduling conflicts, and COVID-19, traveling to meet with hospital teams was not always possible. This meant utilizing digital means of communication such as teleconferencing and/or video conferencing, which still provided a face-to-face connection. This saved the training teams' time and cost, while keeping them connected and safe from possible exposure risk.

The Future

Oregon's Future After the PRQC

The Oregon EMSC Program Manager, as well as the staff from Providence St. Vincent Medical Center and the providers from Doernbecher Children's Hospital and Randall Children's Hospital at Legacy Emanuel, agreed to continue the pediatric readiness efforts beyond the lifecycle of the PRQC project. Both Oregon teams came together to discuss the vision, mission, and elements to include in a new Pediatric Readiness Program, as well as how to work together and become a larger support team.

A draft outline of the Pediatric Readiness Program was shared with the Oregon PRQC project teams. Hospital representatives were asked to review and provide feedback on the future program, as well as to become pediatric readiness champions. The Pediatric Readiness Program team also had meetings with outside stakeholders that could potentially provide support to the program. Meetings were held with several of local pediatric stakeholder organizations, as well as representatives from the Oregon chapters of the Emergency Nurses Association (ENA), American Academy of Pediatrics (AAP), and American College of Emergency Physicians (ACEP).

After collecting feedback and much discussion, the new Pediatric Readiness Program was developed. It is a not-for-profit, collaborative effort to promote enhanced pediatric emergency care through quality improvement work, education, and knowledge sharing among EDs who care for kids across Oregon and Southwest Washington. The interdisciplinary program team of physicians, nurses, educators, and public health professionals is motivated by a passion for providing high-quality emergency care to children with the spirit of continuous improvement wherever we practice. The team is interested in facilitating meaningful collaboration with participating hospitals to improve everyday pediatric readiness.

After program development was complete, the next step was to setup a Pediatric Readiness Program website to serve as the new repository for resources that had been collected over the course of the PRQC project and house future pediatric readiness resources. The new website, www.pedsreadyprogram.org, is divided into three sections: education, resource sharing, and quality improvement. With the website complete, an introduction to the Pediatric Readiness Program was emailed to all Oregon and Southwest Washington hospitals' Chief Executive Officers, Chief Nursing Officers, and Emergency Department Nurse managers or equivalent, as well as shared with the members of the Oregon chapters of the ENA, AAP, and ACEP. All Oregon and Southwest Washington hospitals have been invited to join the Pediatric Readiness Program at the level that best meets their individual needs.

Alaska's and Wisconsin's Future After the PRQC

In Alaska and Wisconsin, the PRQC project provided an opportunity to strengthen existing relationships with EDs and develop productive new relationships. The project provided a reason for the EMSC Programs to connect with EDs, and those that became involved with PRQC project continued to be engaged as partners after the project was complete. The project has also strengthened relationships between EDs in tertiary, academic, and community hospitals.

The PRQC project heightened awareness of the Alaska and Wisconsin EMSC Programs and directed the QI efforts of the participating hospitals toward pediatric readiness. The success of the PRQC project will be leveraged as the EMSC Programs continue to support pediatric readiness efforts such as pediatric medical recognition for EDs in their states. The Alaska EMSC Program already has a Pediatric Facility Recognition program in place, and PRQC strategies and resources will support the participation of additional hospitals in the recognition program. Wisconsin is planning to meet with statewide partners to discuss the importance of pediatric readiness and the potential benefits of a statewide hospital recognition program.

Future Collaboratives and EMSC Program Manager Involvement

The success of QI collaboratives can deepen the work of EMSC Program Managers and further the mission of the HRSA EMSC program. As EMSC Program Managers and the HRSA EMSC program continue to drive improvements in pediatric emergency care, future QI collaboratives must focus on enhancing processes of care that directly impact pediatric patients and their families. Therefore, future QI collaboratives will target healthcare providers and administrators across the pediatric emergency care continuum to improve pediatric emergency care delivery. EMSC Program Managers, through their knowledge of systems of emergency care as well as healthcare networks within states and U.S. territories, will play a vital role in this targeted effort.

While optimization of care processes within hospitals and EMS agencies are outside the scope of EMSC Program Managers, coordination and management of QI collaborative participants will help ensure the success and impact of their work. EMSC Program Managers can enhance awareness of QI collaboratives, which improves recruitment, encourages engagement, and helps bridge partnerships across diverse stakeholders. EMSC Program Mangers may also find local QI collaborative resources, tools, and formal endorsements from state chapters of professional organizations and hospital associations. Finally, EMSC Program Managers and their respective EMSC Advisory Committees, can provide backing to QI collaborative activities through public recognition. Support and recognition from a state or U.S. territory EMSC Program can encourage healthcare providers and administrators to adopt efforts to decrease pediatric morbidity and mortality and integrate pediatric emergency care needs into the day-to-day operations of the EMS systems.

Appendix A. Terms and Definitions

Term	Definition
Quality Improvement (QI)	The process of systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups.
Train-the-Trainer model	A framework for training potential instructors or subject matter experts to enable them to train other people in their organization or initiative.
SMART aims	SMART is an acronym that stands for Specific, Measurable, Achievable, Realistic, and Timely. A SMART aim is an explicit statement which describes what a successful project is expected to achieve using SMART principles.
Key driver diagram	A visual display of a team's theory of what "drives," or contributes to, the achievement of a project aim. This clear picture of a team's shared view is a useful tool for communicating to a range of stakeholders where a team is testing and working.
Process maps	A tool that graphically shows the inputs, actions, and outputs of a process in a clear, step-by-step map of the process. Process mapping can help identify bottlenecks, repetition, and delays, as well as help to define process boundaries, process ownership, process responsibilities and effectiveness measures or process metrics.
SWOT analysis	A strategic planning technique used to help an organization identify Strengths, Weaknesses, Opportunities, and Threats related to project planning.
Fishbone diagram	A cause-and-effect diagram that helps managers to determine the root causes of variations, pain points, or failures. The diagram looks just like a fish's skeleton with the problem at its head and the causes for the problem feeding into the spine.
Plan-Do-Study-Act	An iterative, four-stage problem-solving model used for improving a process or carrying out change. It includes developing a plan to test the change (Plan), carrying out the test (Do), observing and learning from the consequences (Study), and determining what modifications should be made to the test (Act).

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