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Seminars in Perinatology

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State-based perinatal quality collaboratives: Pursuing improvements in perinatal health outcomes for all mothers and newborns

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ARTICLE INFO

Keywords:

Perinatal Quality Collaborative
Quality Improvement
Population Health
Public Health States

ABSTRACT

State-based perinatal quality collaboratives (SPQC) have become increasingly widespread in the United States. Whereas the first was launched in 1997, today over 40 states have SPQCs that are actively working or are in development. Despite great variability in the structure and function of SPQCs among states, many have seen their efforts lead to significant improvements in the care of mothers and newborns. Clinical topics targeted by SPQCs have included nosocomial infection in newborns, human milk use, neonatal abstinence syndrome, early term deliveries without a medical indication, maternal hemorrhage, and maternal hypertension, among others. While each SPQC uses approaches suited to its own context, several themes are common to the goals of all SPQCs, including developing obstetric and neonatal partnerships; including families as partners; striving for participation by all providers; utilizing rigorous quality improvement science; maintaining close partnerships with public health departments; and seeking population-level improvements in health outcomes.

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Introduction

State Perinatal Quality Collaboratives (SPQCs) are networks of perinatal care providers and public health professionals seeking to improve health outcomes for mothers and newborns at the state level through quality improvement. SPQCs have seen increasing success in improving the care of mothers and newborns, and many states have launched SPQCs in recent years. It appears SPQCs have a unique and significant role in perinatal quality improvement beyond existing efforts carried out by hospitals, public health agencies, and other organizations. In

this article, we briefly review the background of SPQCs within the context of quality improvement in general, highlight some of their particular improvement successes, and discuss some common features of SPQC structure and function.

Background of State Perinatal Quality Collaboratives

The Institute of Medicine defined quality as “the degree to which health services for individuals and populations

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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<http://dx.doi.org/10.1053/j.semperi.2017.03.009>

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increase the likelihood of desired health outcomes and are consistent with current professional knowledge”.¹ Published efforts to improve patient care and outcomes have a long and varied history.^{2,3} Applications of standardized improvement methods in health care followed multiple uses of these methods reported by other industries including airlines, nuclear power and automobile manufacturing. Much of this work used the improvement principles put forward by W. Edwards Deming during his tenure in Japan immediately following the end of World War II.⁴ Deming described five elements of improvement: understanding the overall processes involving suppliers, producers, and customers of goods and services (system); understanding the range and causes of variation in quality; understanding the use of statistical sampling in measurements; understanding the concepts explaining knowledge and the limits of what can be known; and understanding concepts of human nature. These principles were further developed and tested in a variety of health care settings by newly formed improvement organizations such as the Institute for Healthcare Improvement (www.ihl.org) and the National Institute for Child Health Quality (www.nichq.org).

Collaborative Improvement

Improvement efforts can be characterized as either independent or collaborative. *Independent* health outcomes improvement efforts tend to be initiated by individual providers, clinics, hospitals or care organizations. In contrast, *collaborative* improvement of system processes and outcomes is designed such that multiple, sometimes competing, organizations share common goals and lessons learned in the application of improvement science principles. Collaborative quality improvement can accelerate the rate of improvement in several ways: allowing shared, simultaneous learning across organizations to occur; encouraging different organizations to improve different aspects of complex systems, including within their different patient populations; and encouraging constructive competition between organizations based on an inherent desire to avoid being “second best” in achieving their shared goals of quality improvement. Both independent and collaborative improvement programs exist, with results reported either anecdotally or more formally, supported by rigorous scientific methods. A 2008 systematic review evaluating collaborative quality improvement programs found that the measurable impacts of such collaboratives were positive but the evidence is limited.⁵ More recent reviews focused on pediatric and perinatal improvement collaboratives have suggested that appropriately designed collaboratives can lead to significant improvements in health outcomes.^{6–9}

State-based improvement collaboratives

State-based, perinatal care and outcomes improvement collaboratives began in 1997 when some of the neonatal intensive care units in California agreed to work together to improve the care of pregnant women and newborn infants.^{10,11} Named the California Perinatal Quality Care Collaborative (CPQCC), these neonatal intensive care units

partnered with the State of California Department of Health Services, Maternal and Child Health Branch to improve perinatal health outcomes in the participating institutions. CPQCC developed a multi-layered data system that included clinical data from participating hospitals, vital statistics from the Department of Health Services, and resource utilization data from Medicaid, and used this database to provide performance benchmarking reports to members. They identified opportunities for improvement through variations in outcomes and processes and built robust toolkits and collaborative quality improvement initiatives to engage members in wide scale improvement efforts.

The methods and achievements of CPQCC were widely disseminated and used by perinatal clinicians and others to build similar SPQCs in North Carolina, New York, Tennessee and Ohio, followed soon thereafter by others. In some states, SPQCs were launched by clinical providers seeking to expand and spread improvement efforts; in other states, SPQCs were launched by public health departments seeking more effective mechanisms for achieving state health goals. National organizations such as the Vermont Oxford Network, the American Congress for Obstetrics and Gynecology, and the March of Dimes provided critical support and encouragement of new SPQCs. In 2011, the Centers for Disease Control and Prevention (CDC) launched a new initiative providing grant support to three SPQCs, and expanded this to six states in 2014. In 2016, the CDC and the March of Dimes launched the National Network of Perinatal Quality Collaboratives (NNPQC), with the goal of encouraging the development of an SPQC in every state (<https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pqc.htm>). Today, over 40 states have formed or are forming a state-based perinatal quality collaborative.

Improvements in care from State Perinatal Quality Collaboratives

Quality collaborative networks in general, and SPQCs in particular, have used a variety of approaches to contribute to improvements in perinatal care. In addition to implementation of interventions to improve perinatal care, SPQCs have contributed to perinatal care improvement by identifying variations in care and outcomes among centers, utilizing large databases to identify clinical risk factors for adverse outcomes, and examining systemic and human factors associated with quality of care. While some of this work has resulted in broadly influential publications in perinatology, in this review, we focus on quality improvement initiatives by SPQCs that target specific improvements in maternal or newborn care.

An important limitation of this review is that only a few SPQCs have published their work in peer-reviewed journals; many other SPQCs have conducted highly successful initiatives that have been shared informally at meetings and conferences and through websites, but have not been published. Therefore, this is not meant to be a comprehensive review of the broad array of initiatives undertaken by all SPQCs, but rather an examination of the more common projects among states. A broader list of topics that have been

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