



Healthcare management strategies: interdisciplinary team factors

Pamela Andreatta and David Marzano

Purpose of review

Interdisciplinary team factors are significant contributors to clinical performance and associated patient outcomes. Quality of care and patient safety initiatives identify human factors associated with team performance as a prime improvement area for clinical patient care.

Recent findings

The majority of references to interdisciplinary teams in obstetrics and gynecology in the literature recommends the use of multidisciplinary approaches when managing complex medical cases. The reviewed literature suggests that interdisciplinary team development is important for achieving optimally efficient and effective performance; however, few reports provide specific recommendations for how to optimally achieve these objectives in the process of providing interdisciplinary care to patients. The absence of these recommendations presents a significant challenge for those tasked with improving team performance in the workplace. The prescribed team development programs cited in the review are principally built around communication strategies and simulation-based training mechanisms. Few reports provide descriptions of optimal team-based competencies in the various contexts of obstetric and gynecology teams. However, team-based evaluation strategies and empirical data documenting the transfer of team training to applied clinical care are increasing in number and quality.

Summary

Our findings suggest that research toward determining team factors that promote optimal performance in applied clinical practice requires definition of specific competencies for the variable teams serving obstetrics and gynecology.

Keywords

competencies, interdisciplinary teams, obstetrics and gynecology, performance evaluation, quality and safety

INTRODUCTION

Interdisciplinary and multidisciplinary team factors are important contributors to clinical performance and clinical outcomes [1]. According to the Joint Commission, failures in teamwork and communication are among the leading causes of adverse obstetric events and sentinel events [2,3]. Governing and regulatory agencies such as the Joint Commission and Agency for Healthcare Research and Quality (AHRQ), professional organizations such as the American College of Obstetricians and Gynecologists (ACOG) and the American College of Nurse Midwives (ACNM), and provider networks such as the California Maternal Quality Care Collaborative (CMQCC) have all presented various mandates toward improving interdisciplinary and multidisciplinary team performance in obstetrics and gynecology [4–6]. This review examines the English language published literature indexed

through *Cochrane* and *Medline* databases from January 2011 through June 2012 using the following key terms: interdisciplinary, multidisciplinary, team, obstetric, gynecology, training and development. Our objective was to consider those team factors that have been identified as contributors to performance and patient outcomes, as well as to ascertain research trends associated with interdisciplinary and multidisciplinary team performance in obstetrics and

Department of Obstetrics and Gynecology, University of Michigan Medical School, Ann Arbor, Michigan, USA

Correspondence to Pamela Andreatta, PhD, Department of Obstetrics & Gynecology, University of Michigan Medical School, L4000 Women's Hospital, 1500 Medical Center Drive, Ann Arbor, MI 48109, USA. Tel: +1 650 585 4023; e-mail: pandreat@umich.edu

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KEY POINTS

- Interdisciplinary team performance is valued for managing complex medical conditions; however, the team-related competencies that lead to optimal team performance are ill defined for the various types of obstetric and gynecology teams.
- Prescribed interdisciplinary team training and evaluation protocols principally rely on team-based communication skills derived from the TeamSTEPPS, CUSP, or similar programs; however, further consideration of other team competencies is merited.
- Simulation-based training remains an active area for team development and associated research, with empirical findings advancing to include performance and clinical outcomes.
- Interdisciplinary teams have led to the identification and resolution of system-based problems that might have gone unnoticed when considered within the context of a single discipline.
- Not all obstetric and gynecology teams have the same contextual challenges; thus, team development efforts should target preidentified team-specific competencies in order to gain the greatest transfer benefit for applied clinical practice.

gynecology. We evaluated 128 articles that met these criteria.

MANAGEMENT OF COMPLEX MEDICAL CONDITIONS

The management of complex medical complications and preexisting conditions that require a multidisciplinary approach during pregnancy was the subject of the majority of publications referencing the importance of interdisciplinary teamwork in obstetrics. Conditions such as fetal anomalies [7–10], maternal drug addiction [11], preexisting or concomitant maternal diseases, congenital abnormalities [12,13[■],14–20], and antenatal and postpartum emergencies [21–23,24[■],25[■],26–28] require significant coordination between obstetricians, neonatologists, and various associated specialty and subspecialty providers to successfully manage the care provided for both mother and baby. Several of the reviewed reports proposed that a multidisciplinary approach and improved interteam communication could lead to better patient outcomes. For example, management of massive postpartum hemorrhage requires a multidisciplinary approach that includes nursing, obstetrics, anesthesia, and the blood bank collaborating in resuscitation efforts [24[■]]; however, the literature

suggests that team development efforts are insufficient to adequately instantiate sustainable improvement in applied clinical practice and few specifics are elucidated for best team-based practices. The reported team development efforts included in this review did not include ancillary support staff, such as unit clerks and technicians, who frequently coordinate patient management issues such as clinician paging or room transfers. These functions are critical for coordinated, team-based patient management.

Of the 128 articles included in this review citing the critical contribution of interdisciplinary teamwork in the successful management of patients with complicating medical factors, only one delineated how the team set about working together to assure the likelihood of optimal outcomes. In their work, Shields *et al.* [25[■]] reported that in addition to physicians and nursing staff reporting improved clinical knowledge and comfort levels responding to a maternal hemorrhage, a comprehensive team-performance protocol for managing postpartum hemorrhage reduced the recognition and response time for clinicians, patient blood loss, the use of blood products given to patients, and the number of patients experiencing life-threatening disseminated intravascular coagulopathy. Still, for the most part, the literature associated with interdisciplinary team factors in obstetrics reports on the value of teamwork, but offers no suggestions for how to ensure optimal team functioning.

We identified similar trends in examining the literature published on team factors in gynecology. The management of female cancer patients was reported to require the coordination of clinical care provided by gynecologists, gynecologic oncologists, plastic and other subspecialty surgeons, anesthesiologists, physiotherapists, pharmacologists, nurses, and social workers [29–33]. Likewise, a team-based approach was reported for the management of ureteral endometriosis [34[■]], ovarian cystadenomas [35[■]], vesicovaginal fistula [36], and provoked vestibulodynia [37[■]] that included the above referenced specialty and subspecialty clinicians, in addition to pelvic floor physiotherapists, psychologists, and sexologists. As with obstetric teams, a multidisciplinary approach and interteam communication are identified as being critical in the gynecologic operating room. Kincey *et al.* [35[■]] described the management of large bilateral cystadenomas, and how all of the team members were critical to the successful management of this patient. From the surgeon and anesthesiologist to the aids that provided transport to the operating room, each team member provided a unique and important role. Although less plentiful than the literature on obstetric teams, the reviewed gynecology literature principally

acknowledges the importance of interdisciplinary and multidisciplinary teamwork toward achieving optimal patient outcomes. However, no specific information was provided about how the teams functioned to achieve those outcomes.

The consensus opinion of these reports is that team development efforts leading to optimal inter-team communication and coordination are essential for improving patient care. The challenges arise when considering what those team development efforts target, how they are facilitated, and how their success is measured. Team development efforts are further complicated by the fact that team members in obstetrics and gynecology may be required to function as a member of an obstetrics team in one context and as a member of a gynecology team in another, often within the same day and sometimes concurrently. For example, a physician may collaborate with a nurse s/he routinely works with to provide care for a laboring patient in one moment, in another, move to the operating room to work with a scrub nurse s/he has never met, and later, be called to the emergency department to consult on a case with no preestablished relationship between either the patient or the other clinical team members. Each of these situations will require different forms of team-based communication and coordination strategies, as well as different approaches to collaborative problem solving. Thus, a one-size-fits-all approach to team development is impractical, and team-specific needs should be considered when devising strategies for optimizing team performance factors. Context is key and identifying a team's situational needs is imperative for the development of programs designed for optimizing team performance. Absent the specificity that helps team members transfer optimal behaviors to their applied practice, it is difficult to gain the measurable and sustainable outcomes team development efforts aspire to. This may provide some insight into why multidisciplinary team training is often referenced in case reports and literature reviews, but specific recommendations are just as often lacking.

PRESCRIBED TEAM DEVELOPMENT MECHANISMS

Several publications prescribed solutions for introducing formal team development mechanisms, principally in obstetrics [38–41,42[■],43,44[■],45–47], but also in gynecology [48[■],49[■],50]. For example, Rosenstein [44[■]] reported the results of a strategic program designed to reduce the occurrence of disruptive behavior and its adverse impact on staff relationships, communication flow, and patient care. Rosenstein identified specific system-based factors

that contribute to this seemingly intractable problem, which is often compounded in obstetrics services because the physician, nurse, and patient may disagree on issues related to timing, convenience, motivation, priorities, clinical interpretation, or roles and responsibilities. Several studies explicated the value of the patient as an integral team member who is often overlooked when considering team-based coordination of care [9,49[■],51[■],52,53[■]]. We found no indexed reports on team development related to ambulatory care contexts.

Many of the reviewed studies reported on the use of protocols and processes for evaluating specific team needs toward achieving desired performance or clinical objectives [54–57,58[■]]. Although most of these protocols were developed by the researchers, those developed by the AHRQ, including Team-STEPPS (Team Strategies and Tools to Enhance Performance and Patient Safety) [59] and CUSP (Comprehensive Unit-based Safety Program [60]) were frequently referenced as being advantageous for initiating interdisciplinary team development programs in practice [41,42[■],45–47,56,61,62[■],63[■]]. Several authors described either performance-related or clinical outcomes that were directly attributed to team development efforts [42[■],58[■],64[■]–67[■]]. Of particular note are the outcomes reported by Grunebaum *et al.* [68[■]], who presented the resulting effects of a comprehensive obstetric patient safety program on reducing compensation payments and sentinel adverse events at a tertiary academic referral center with a level 3 neonatal ICU and associated labor and delivery unit performing more than 5000 deliveries per year. The program was initiated in 2009 and retrospectively evaluated from 2003. They report average yearly compensation payments decreased by 91% between 2003–2006 and 2007–2009, and that sentinel events decreased from five in 2000 to none in 2008 and 2009. These findings provide substantive evidence in support of the financial, as well as quality and safety, benefits of investing in interdisciplinary team development.

TEAM EVALUATION STRATEGIES

Several studies described assessment strategies designed to measure progress toward achieving identified performance objectives, from airway management to intraoperative interruptions to communication associated with patient handoffs [65[■],67[■],69–71,72[■],73–75,76[■],77]. Although some of these reports are weakened by relatively poor psychometric properties and the absence of the defined team performance objectives we previously pointed out, several of these studies provide excellent examples of the type of work required to

establish and assess the competencies that will move team-based science in obstetrics and gynecology forward. For example, Morgan *et al.* [72[■]] conducted a rigorous evaluation of the psychometric properties of The Assessment of Obstetric Team Performance (AOTP) and the Global Assessment of Obstetric Team Performance (GAOTP) evaluation tools that were designed to assess human factors associated with multidisciplinary obstetric team performance (nontechnical skills). The AOTP and GAOTP are designed to assess multidisciplinary obstetric team performance in the context of high-fidelity simulation, which distinguishes it from other human factors assessment instruments that target specific disciplines and specialties.

SIMULATION-BASED TEAM TRAINING

The use of simulation-based training remains at the forefront of interdisciplinary activities used for team development in coordinating clinical care during obstetric emergencies [9,42[■],56,58[■],63[■],66[■],68[■],75,78[■],79,80[■],81–83]. Studies in this area have notably moved away from reporting on the acceptance of the training method, incremental performance improvement in the simulated context [42[■],58[■],78[■]], and using simulation to advance clinical practice [84[■]], to evaluate the transfer of performance outcomes to applied clinical practice. Advances in this area of research have led to several published reports directly correlating improved team performance after simulation-based training to improved clinical performance concomitant with favorable clinical outcomes. This is illustrated by separate, but related, research conducted by Lipman *et al.* [64[■]] and Marzano *et al.* [42[■]]. Lipman *et al.* [64[■]] discussed how simulation could be used to compare perimortem cesarean delivery during simulated arrests occurring outside the operating room. Their results suggested that perimortem cesarean delivery during resuscitative efforts for an actual arrest could delay care by more than 5 min and should be performed in the labor room rather than relocating to the operating room. Similarly, Marzano *et al.* [42[■]] reported on team performance and clinical outcomes related to a patient who underwent perimortem cesarean delivery after acutely aspirating and progressing to full cardiopulmonary arrest in her room on a general care floor.

The occurrence of these types of critical events is rare (due to good management and sometimes good luck), and, therefore, accumulating a dataset large enough to demonstrate improved outcomes are directly a result of team training will remain difficult. However, these types of empirical data inform the body of evidence in aggregate and we

recommend that they be reported to the extent possible. Because of the relative rarity and emergent nature of these types of events, it is quite difficult to capture sufficient data to assert a causal relationship between simulation-based training and team performance during emergencies leading to improved clinical outcomes; however, previously published evidence in pediatric medicine showed statistically significant correlation of 0.87 [85]. Assembling a confluence of evidence in this area from multiple institutions over time will be necessary to document the impact of team development drills on managing obstetric emergencies, and the outcomes reported in these publications provide an auspicious beginning.

COLLABORATIVE QUALITY INITIATIVES

Apart from team development toward achieving objectives in the management of a specific patient or clinical event, several articles reported the advantages of interdisciplinary teams identifying system-based problems and devising strategies for resolving process and institutional challenges that impact patient care in general. Some of these challenges include obtaining informed consent from laboring patients who may be compromised by pain during the process [86[■]], devising a framework for evaluating mode of delivery in obstetric care [87[■]], determining essential factors for successfully implementing an interdisciplinary team training program [62[■]], and identifying discrepancies in interdisciplinary policies and procedures that could adversely impact patient care [88[■]]. Perhaps, the most ambitious use of interdisciplinary teamwork toward system-wide problem solving is the CMQCC [89[■]]. The CMQCC OB Hemorrhage Task Force is cochaired by nurse and physician team leaders working together to model the value of teamwork and demonstrate the potential for effective interdisciplinary collaboration to make a difference in the quality of care for women, eliminate preventable maternal death and injury, and promote equitable maternity care in California. The task force identified maternal hemorrhage as a significant quality improvement opportunity and established objectives to implement and evaluate a multilevel strategy that includes an open access toolkit, support-mentoring, county partnerships, and a 30-hospital learning collaborative to improve readiness, recognition, response, and reporting of maternal hemorrhage at birth. This statewide initiative is both comprehensive and ambitious in its aims and the outcomes will likely inform similar programs in other regions.

DISCUSSION

Overall, our review suggests that the preponderance of literature related to interdisciplinary and multi-disciplinary team factors credits clinical management and patient outcomes to successful team-based practice. The reviewed literature provides few, if any, recommendations for how to optimize team behaviors and institutional practices that are documented contributors to team performance in other professions. Examples of these team competencies include leadership, coordination, feedback, planning, communication, assertiveness, common attitudes, situational awareness, decision-making, performance monitoring, information processing, shared expectations, interpersonal relations, adaptability, and team cognition [90–94]. Some of these competencies, such as following communication protocols, are conceptually straightforward and easily evaluated. Others, such as situational awareness or team cognition, are less precise, and therefore, more challenging to define and assess.

Each interdisciplinary obstetric or gynecology team consisted of different constituents depending on the clinical contexts and details of the patient, and the team's functional requirements will differ depending on factors such as the amount of time they will work together, their clinical tasks, the urgency of their formation, and the acuity of the clinical need. Therefore, if the frequency of team-based emergency drills correlates with improved team performance and clinical outcomes related to the management of emergencies, similar uses of drills might not improve performance outcomes for a team responsible for collaborative management of patient care on an ongoing basis. The demands of an emergency response team are quite different from those of a team that routinely works together providing nonurgent patient care, or from other teams such as those that collaboratively manage patients with multiple medical or surgical complications. That is, requisite competencies may vary by the type of team, such that what may be perceived as a critical competency for one team may be less important for another team. A typology for healthcare teams describes four primary compositions of clinical teams related to the stability of membership and the role of team members in performing clinical tasks [95]. Teams are classified as having either variable or stable membership, and variable or stable task responsibilities (Fig. 1). Those teams with variable membership and role characteristics, such as emergency response teams, could benefit from cross-training and developing situational awareness, whereas teams with stable membership and role allocation might benefit more from developing shared decision-making and strategic

		Team role	
		Stable	Variable
Team Personnel	Stable	Type $S_R S_P$	Type $V_R S_P$
	Variable	Type $S_R V_P$	Type $V_R V_P$

FIGURE 1. The healthcare team typology describes compositional characteristics of interdisciplinary clinical teams. $S_R S_P$, stable role, stable personnel; $S_R V_P$, stable role, variable personnel; $V_R S_P$, variable role, stable personnel; $V_R V_P$, variable role, variable personnel. Reproduced with permission from [95].

planning. The healthcare team typology may provide a guide for defining team competencies, selecting targeted team development strategies, and optimizing protocols and training programs for the many types of obstetrics and gynecology teams. It may also provide a framework for designing empirical studies that will provide insight into which factors are most important for specific types of teams.

CONCLUSION

The results of our review confirm that interdisciplinary teams are essential for the successful management of the patients who have complex conditions requiring the expertise of multiple specialties. However, little to no research reported empirical data to inform how such teams optimally function or how high functioning teams optimally improve in different contexts through strategic team development efforts. The value of interdisciplinary team performance is clear. We need to analyze the various types of teams that manage obstetrics and gynecology patients and begin to evaluate how we can optimally develop those teams to efficiently provide superior and safe patient care. We propose to first determine the team type and evaluate the factors that lead to superior team performance for that team. After the relevant performance factors are determined, they can be used to create protocols and performance

standards, and implement team development activities. Finally, it is important to evaluate the impact of those activities on the established performance objectives. Sharing the results of these types of studies with the practice community will further benefit cost-effectiveness, clinical outcomes, and patient safety.

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Conflicts of interest

P.A. and D.M. have no conflicts of interest to disclose.

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- of special interest
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Additional references related to this topic can also be found in the Current World Literature section in this issue (p. 477).

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