THE PERIOPERATIVE SURGICAL HOME (PSH)

INTERVIEW RESULTS FROM 15 SELECTED U.S. PROGRAMS

Bita A. Kash, PhD, MBA, FACHE
Kayla M. Cline, MS

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EXECUTIVE SUMMARY

OBJECTIVE

This study is a joint endeavor of the American Society of Anesthesiologists (ASA) and Center for Health Organization Transformation (CHOT) at Texas A&M University Health Science Center. The purpose of this study is to learn more about the perioperative surgical home (PSH), an anesthesiologist-led surgical care coordination model that is developing independently at several sites around the United States.

The first phase of this study involved a comprehensive literature review that was completed in August of 2013 and subsequently updated in January and May of 2014. The findings from this review were used to develop the script for the interviews conducted with anesthesiologists and administrators at PSH sites around the nation. The findings from these interviews are discussed in the main text of this document. Please see the Appendix for a summary of the findings from the literature review.

METHODS

Potential PSH interview sites were selected based on the results of two ASA-sponsored surveys of practitioners and CFMAP (Committee on Future Models of Anesthesia Practice) members. Cost constraints limited the scope of the project to 15 sites. These final 15 sites were selected based on votes of CFMAP members, interest shown by the organization in participating, affiliation with one primary health system, and to obtain wide geographic representation. These interviews were conducted in the fall of 2013 over the course of several months. Interviews generally lasted one to two hours.

RESULTS

There was wide variety in the sample in terms of type of practice, size of affiliated healthcare system, elements of the PSH program implemented, and stage of implementation. Most practices were still in the planning phase of at least some part of PSH implementation, whether that was to expand the postoperative care managed by the PSH or to expand the PSH to other service lines. Most PSH programs were heavily involved in the pre- and intraoperative phases of surgery, but less involved in postoperative care beyond pain management. Almost all practices offered some formalized acute or chronic pain service.

Important enablers of PSH implementation success were an emphasis on patient safety and satisfaction, ability to generate surgeon satisfaction, ability to prove PSH success, strong IT capabilities, leadership commitment, readiness for change, strong people engagement, and efforts to develop a payment model. Barriers to PSH implementation success were a lack of financial resources, specialty territorialism, resistance to change by practitioners, a lack of evidence for PSH success, and a lack of IT capabilities.

PSH programs were generally very important to the anesthesiologists interviewed, and slightly less important to other anesthesiologists, health care systems, and surgeons. Several interviewees indicated the presence of territorialism, either with surgeons or hospitalists. Almost all interviewees considered PSH-type programs to be essential to the future of anesthesiology.

CONCLUSIONS

The PSH-type programs interviewed varied widely, indicating a need for the definition of the perioperative surgical home – what are the key components? Furthermore, many interviewees indicated a need for a clarification of the financial model of the PSH, as many of the services offered by PSH programs are largely uncompensated.

THE PERIOPERATIVE SURGICAL HOME PROJECT

The Perioperative Surgical Home (PSH) has most recently been defined as "an innovative, patient-centered, surgical continuity of care model that incorporates shared decision making" (Vetter et al. 2013). The purpose of the PSH is to improve patient outcomes and reduce the cost of surgical care by coordinating care throughout the perioperative process and increasing patient engagement in each phase of surgery.

TABLE 1. PERIOPERATIVE SURGICAL HOME ELEMENTS

Preoperative Key Elements	Intraoperative Key Elements	Postoperative Key Elements
• Admission through a centralized preoperative area/clinic • Early preadmission assessments • Centralized systems to gather health and other information about patients before hospital admission • Preoperative innovations such as "prehabilitation" programs for targeted patients • A triage system to identify which patients need to attend a preadmission clinic or program • Use of a multidisciplinary team based clinical care processed within the hospital to coordinate preparation of patients before surgery	• Integrated pain management • Fast-track surgery and discharge home • Precise fluid management • OR delay reduction techniques • Increased OR efficiency through improved OR flow • Scheduling initiatives to reduce cancellations and increase efficiency	• Integrated pain management • Early postoperative mobilization by physical therapy and integrated acute-care and rehabilitation care • Improved coordination of care from postoperative to discharge home • Improved discharge protocol • Increased patient and caretaker education concerning post-discharge care

This project aims to identify key elements of the PSH (see Table 1), obtain descriptive information about the state of PSH programs around the nation, and define a conceptual model of perioperative surgical care. This is accomplished in three phases:

1. *Phase 1*: Comprehensive literature review of PSH concept (June - August 2013)
2. *Phase 2:* Primary data gathering via key informant interviews (September - December 2013)
3. *Phase 3:* Literature review update, data analysis, and PSH program report (January - April 2014)

The purpose of this document is to discuss preliminary findings from the key informant interviews (Phase 2 above). For a summary of findings from the literature review conducted in Phase 1, please see the Appendix at the end of this document.

FINDINGS FROM KEY INFORMANT INTERVIEWS

RESEARCH APPROACH

The aims of this study of the new and evolving PSH systems emerging within the US healthcare landscape are well aligned with the aims of IOM's Committee on Quality of Health Care in America in describing and understanding the role of healthcare microsystems in quality improvement efforts (Molla and Mohr 2001). According to the IOM report, a healthcare microsystem is defined as a *"small, organized patient care unit with a specific clinical purpose, set of patients, technologies and practitioners who work directly with these patients."* The concept of the PSH as a system of care not only fits this definition by the IOM but also includes the necessary elements of microsystems as defined by Nelson and colleagues (Nelson et al. 2011) for the healthcare industry:

- A core team of healthcare professionals working as a team toward a common aim, service line and/or clinical purpose
- Defined patient population with similar disease profile
- Information systems and environment to support the work of the professionals and patients
- Support staff, equipment, culture, and work environment enabling shared performance outcomes

Therefore, the CHOT research team followed microsystems theory as applied to the healthcare industry to both organize and complement interview questions aimed at better understanding the PSH program initiatives identified as part of the study sample.

The development of the interview instrument was primarily driven by an initial list of suggested questions offered by ASA leadership. Questions were added to address concepts and elements of PSH studies (based on the literature review results) and elements of microsystems as described in the recent IOM technical report. The interview instrument was then organized into subcategories of questions by theme. Questions that were of interest to the ASA leadership addressed anesthesiology practice profile, financial and organizational relationship with the hospital (macro-system), PSH implementation experiences and lessons learned, and PSH performance and reporting. Additional questions added to address the functioning of the PSH as a microsystem fell into the following five topics: level of performance, patient experience, information and information technology, investment in improvements, and leadership and support. Finally, the interview instrument was reviewed, complemented with questions found relevant from the literature review and recent studies on success factors for change implementation in healthcare organizations, including organizational culture and capacity for change (Kash et al. 2013), people engagement, business processes, and patient safety satisfaction drivers (Kash et al. 2014). The resulting interview instrument includes 54 questions organized into the following nine overarching topic categories:

1. Anesthesiology Practice: Demographics
2. PSH Program: Range of Services, Structure and Priorities
3. PSH Program: Patient and Payor Profile
4. Financial and Administrative Relationship with Healthcare Organization
5. Quality Reporting Information Systems: Practice
6. Quality Reporting Information Systems: Hospital
7. PSH Program: Success Factors, Barriers and Current Environment
8. PSH Program Performance
9. PSH and Future of Anesthesiology

Study Sample: Selection of the 15 Organizations

The selection of the 15 potential PSH programs to be interviewed by the CHOT research team was driven by a prior survey of anesthesiologists (ASA members) administered by the ASA headquarters to inventory the types of PSH programs implemented and under development. This effort was complemented by an inquiry about level of interest of the anesthesiologist surveyed to participate in a CMS innovation grant (CMMI) focusing on the development of a PSH initiative. Therefore the CHOT research team started with a list of 55 organizations identified by the ASA based on:

- Participants in the 2012 call for partners for the CMMI grant application,
- People who indicated interest on a sign-up sheet during ASA's Legislative Conference 2013,
- Responses to an initial survey of organizations distributed by ASA (Committee on Future Models of Anesthesia Practice), and
- CFMAP member recommendations

Of these 55 initial organizations, 35 were identified to be included in a short online survey (Survey Monkey) called the "Selection of Organizations to Be Interviewed" survey that was distributed to the Committee on Future Models of Anesthesia Practice (CFMAP), based on the following two criteria: (1) those agreeing to follow-up contact and to participate, and (2) those identified as affiliated with primarily one hospital. The second criterion was used because the interviews are facility-centric and may include multiple personnel at a facility. A partial list of anesthesia practices that were not included in the 35 was also developed for review by ASA and CHOT teams. These are primarily practices engaged in some aspects of the PSH process but that did not indicate a primary hospital. For example, MD Anderson (Houston; major teaching cancer center) and Summit Health/Chambersburg Hospital (PA, non-teaching) were inadvertently omitted from the Survey Monkey list of 35. The latter was a write-in on the survey.

Based on the scope of the CHOT project, we were limited to no more than 15 organizations to be interviewed; however, multiple persons from the same organization could be interviewed. The 15 organizations interviewed were selected based on:

- Votes by 14 CFMAP members among the 35 organizations and additional write-ins,
- Broad geographic representation,
- Whether the organization sent email or otherwise contacted ASA indicating interest,
- Actual progress by the organization on implementing components of the PSH and/or an evaluation that the organization was very close to implementation and extremely "ready" to move forward, and
- Whether the organization was a hospital or group of local hospitals (e.g., part of a health system) that used the same physician anesthesiologists.

A priority for non-academic hospitals was not reflected in the current list but was identified as a desired criterion.

Thus, key informant interviews were conducted with 24 anesthesiologists and practice administrators at 15 PSH sites. Key informants were given the opportunity to review this draft and make revisions prior to distribution.

TABLE 2. LIST OF INTERVIEW SITES

	Interview Site	Location	Number of Interviewees
1.	Allentown Anesthesia Services/Lehigh Valley Health Network	Allentown, PA	1
2.	Matrix Anesthesia/Evergreen Medical Center	Bellevue, WA	1
3.	UAB Medical Center	Birmingham, AL	2
4.	Anesthesia of Boise/St. Luke's	Boise, ID	2
5.	Boston Children's Hospital	Boston, MA	1
6.	Brigham & Women's Hospital	Boston, MA	1
7.	Dartmouth Hitchcock	Lebanon, NH	2
8.	Aurora Medical Group	Milwaukee, WI	3
9.	Vanderbilt University Medical Center	Nashville, TN	1
10.	Anesthesia Services, P.A./Christiana Care	Newcastle, DE	1
11.	Kaiser Permanente	Oakland, CA	1
12.	UC Irvine Medical Center	Orange, CA	1
13.	Oregon Health & Science University Medical Group	Portland, OR	3
14.	Mayo Clinic	Rochester, MN	3
15.	Physicians Anesthesia Service/Swedish Medical Center	Seattle, WA	1

Qualitative Analysis Methodology

The results from most of the questions were easily tabulated or compiled into summary tables, as responses fell into a finite number of categories. There were ten survey questions that were open ended and did not allow for quantification or tabulation of responses. The interview process for these ten questions was a focused, open-ended discussion designed to prompt the participants to share information about the organization's PSH or PSH-like initiative while focusing on initiative success factors, enablers and disablers, challenges, and learnings (Blumer, 1969; Bogdan and Biklen, 1992). The purpose of the qualitative analysis was to identify common themes related to these concepts - covered as part of the ten questions - for the implementation of the PSH initiatives identified by the interviewees using rich qualitative data from the 24 personal interviews.

In most cases (nine of the ten questions) the structure of the qualitative analysis was not led by previous knowledge about PSH program implementation or steps toward successful implementation of change initiatives as presented in the literature review. Therefore, an inductive approach to qualitative analysis was necessary, in which theory is built by examining commonalities between individual responses; the research team approached the results of the interviews with the purpose of theory building by identifying all the dimensions and themes related to the implementation of PSH initiatives in the healthcare setting.

The research team followed grounded theory methodology to apply inductive content analysis when coding the interview data. Team members used open coding and then organized the codes into corresponding subcategories, which resulted in the overarching themes (Strauss and Corbin, 1997). Codes were identified and named at different levels of analysis and consisted mostly of descriptive, with some inferential, code and theme names (Miles and Huberman, 1994). Coding of the interview transcripts was independently performed by two researchers. The themes and their corresponding codes are presented in the qualitative analysis discussion in the key findings section that follows.

One question, concerning enabling factors for PSH implementation, proposed certain answers as prompt for discussion, and thus required the use of deductive qualitative analysis methodology, in which theory is used or tested when interpreting the findings of individual observations. In this case the

theory being tested was linked to the proposed answers or prompts. Deductive qualitative content analysis was employed to identify specific enabling factors needed to successfully implement PSH initiatives as described by interviewees. The interviewer offered prompts including: culture of patient safety or accountability, focus on patient experience and satisfaction, organizational leadership (support), organization is ready for change (org. capacity for change), professional care team shows readiness for change, effective people engagement, information technology capabilities, and clinical and process capabilities. The structure of this qualitative analysis is based on previous knowledge about enabling factors for strategic change initiatives in the healthcare setting with the purpose of testing the applicability of these enabling factors to the PSH change initiatives. Therefore, the research team applied the deductive content analysis process when coding the interview data for this question, using the list of prompts and allowed for new codes and concepts, resulting in emerging themes, as well as the predetermined codes based on prompt (Kyngas and Vanhanen, 1999; Marshall and Rossman, 2010).

KEY FINDINGS

In this section, we report interview results for questions in each of these categories. We conclude this section by recommending how to improve the interview script, questions, and discussion points based on the research team's learning.

The Perioperative Surgical Home Concept

PSH Program Information

Most practices interviewed were part of academic anesthesia groups, and most groups were fully integrated into the hospital or system. 73% of groups served both a tertiary care academic medical center and an ambulatory surgery center, and about half were involved at a community hospital. However, not all practices integrated the PSH program into all locations; approximately 33% implemented the PSH at a tertiary care hospital only, and 27% implemented at a community hospital only.

TABLE 3A. TYPE OF ANESTHESIA PRACTICE

	Number	Percent
Academic	8	53
Single-specialty group	6	40
Community	4	27
Multi-specialty group	2	13
Other	1	7
Total	*21**	*140**

TABLE 3B. RELATIONSHIP TO HEALTHCARE SYSTEM

	Number	Percent
Fully integrated	10	67
Independent – system contracts	6	40
Independent – leased to system	1	7
Large national anesthesia group	1	7
Total	*18**	*121**

TABLE 3C. FACILITIES SERVED

	Number	Percent
Tertiary care academic medical	11	73
Ambulatory surgery center	11	73
Community	8	53
Physician-owned specialty	3	20
Total	*33**	*219**

TABLE 3D. FACILITIES INVOLVED IN PSH PROGRAM

	Number	Percent
All locations	6	40
Tertiary only	5	33
Community only	4	27
Specialty only	0	0
Ambulatory only	0	0
Total	*15*	*100*

*Counts and percentages may not total to 15 or 100 because many interviewees selected more than one category for each of these questions.

TABLE 3E. DEMOGRAPHIC INFORMATION: PRACTITIONERS INVOLVED

	Mean	Median	Min	Max	Std. Dev.	Missing
Number of anesthesiologists employed in practice	58.7	62	21	120	27.8	20%
Number of anesthesiologists employed in practice (FTEs)	51.1	50	19	100	24.6	27%
Practitioners involved in acute pain medicine	16.3	9	0	75	19.5	13%
Practitioners involved in chronic pain medicine	4.5	4	0	12	4.2	13%
Number of non-physician anesthesia providers employed in practice	49.6	23.5	0	250	67.5	13%
Number of non-physician anesthesia providers employed in practice (FTEs)	42.4	22	0	200	54.6	13%

77% programs indicated that all anesthesiologists participated in the PSH program. The remaining 23% answered no. Two programs did not answer this question. When asked about type of non-anesthesiologist provider utilized, of the 13 programs responding, 12 (92%) reported using CRNAs. The other program utilized AAs.

93% of programs reported some sort of student training. 73% reported training residents (mean of 41 per year), 53% reported training CRNAs (mean of 11 per year), and 7% reported training AAs (one program training 12 per year).

Scope of Clinical Practice

The mean number of cases per year across all 15 practices in the OR is 32,595, ranging from 7,000 to 65,000, and out of the OR is 15,779, ranging from 3,000 to 63,000. 60.5% of cases are regional anesthesia, 19% are monitored anesthesia care, and 6.5% are general anesthetics.

The practices surveyed worked in a median of 50 operating rooms, with a minimum of 12 and maximum of 125, and 12 non-OR anesthetizing locations, with a minimum of 4 and maximum of 75. Of the practices involved in critical care, the median number of ICU locations served was 1, with a minimum of 1 and a maximum of 4.

73% of these practices report to the National Clinical Outcomes Registry (NACOR) developed by the Anesthesia Quality Institute (AQI).

Preoperative evaluation and testing was the most common PSH-related clinical practice implemented at the 15 interview sites, closely followed by acute and chronic pain services, as Figure 1 demonstrates.

FIGURE 1. PSH-RELATED CLINICAL SERVICES OUTSIDE THE SCOPE OF OPERATIVE ANESTHESIA SERVICES
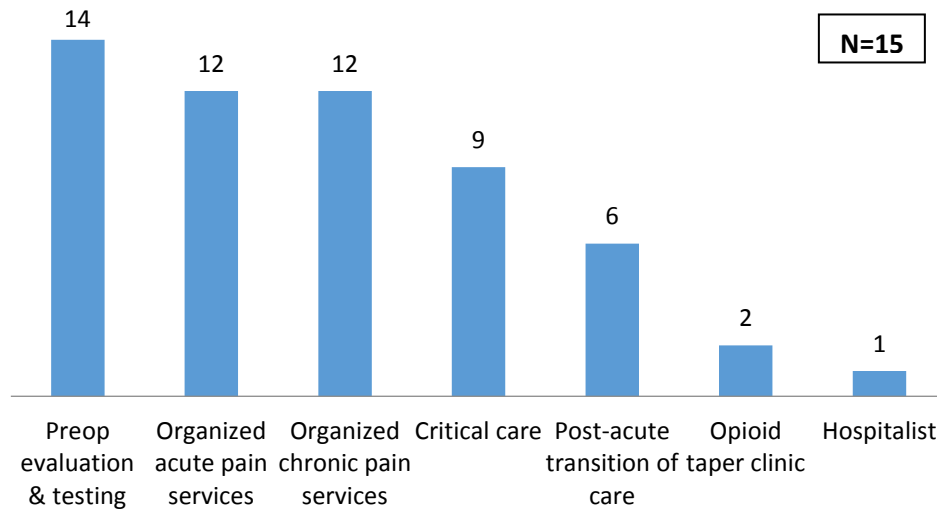
PSH Program: Stage, Range of Services, Structure and Priorities
Stage of Implementation

Interviewees asked which stage of implementation the PSH program at his or her institution fell in. Stages of implementation discussed were based upon a modification of the stages of implementation developed by Fixsen and colleagues (Fixsen et al. 2009):

1. *Planning*: This phase encompasses Fixsen's exploration and installation phases, including identifying the problem, learning about potential solutions, and establishing the resources to develop these solutions.
2. *Early implementation*: This phase is Fixsen's initial implementation phase, in which the solutions are applied on a small scale by a subset of the practice or practitioners.
3. *Late implementation*: This phase is Fixsen's full implementation phase, in which the intervention is applied on a large scale to most or all practitioners.
4. *Sustainability and future growth*: This phase encompasses Fixsen's innovation and sustainability phases, in which practitioners are able to effectively use and improve upon the initial solution.

The phase of implementation reported varied widely. However, many interviewees noted that while one part of the PSH program may be in the sustainability phase (i.e., the preoperative clinic), other phases may be in planning or early implementation (i.e. postoperative care transitions). Thus, many interviewees had difficulty selecting the appropriate stage of implementation.

TABLE 4A: IMPLEMENTATION STAGES

	Number	Percent
Planning	6	40
Early implementation	3	20
Late implementation	4	27
Sustainability	2	13
Total	*15*	*100*

PSH Structure

Approximately 40% of the programs we interviewed used the name "surgical home" or "perioperative surgical home" for the PSH-type program. 40% used another name, and 20% used no formal name at all. Other names included "surgical neighborhood," "center for perioperative services," "perioperative care pathways," and "reengineered preoperative services," among others.

40% of the programs interviewed mentioned no formal care coordination processes. An additional 40% informally coordinated care through the PSH program or anesthesia services. 20% had a formalized care coordination process in place, with designated care coordination protocols or staff. Interviewees frequently interfaced with the following parties in the process of coordinating patient care:

TABLE 4B: COMMON CARE COORDINATION PARTNERS

Coordinate with:	Number	Percentage
Internists	8	53%
PCPs	6	40%
Surgeons	6	40%
Faculty	5	33%
Community providers	4	27%
Academic medical centers	4	27%
Specialists	2	13%

The organizational structure of the PSH programs interviewed varied widely. Most of the organizations did not have a formal organizational structure in place. The informally structured organizations primarily depended upon collaborations between previously existing roles, such as medical directorships or operating room governance committees and relevant practitioners, to design and implement PSH programs. One study participant described the evolving organizational structure as follows:

"All these things are evolving on their own, in their own time. With that said, we have a perioperative center director. I guess I would call them the medical director. We don't really have a program, per se, to coordinate. At each of the elements, we have a medical director of preadmission testing. We have a medical director of the PACU recovery area. We have a medical director of our regional block clinic. Each of these elements have their own director."

Some of the more common organizational arrangements included:

- Divisional workgroups or management committees that often include medical directors of pain medicine, critical care, or preoperative evaluation or testing and chief of staff or quality.
- Direct leadership or co-leadership by medical directors, such as medical director of preoperative testing, PACU, regional blocks, or nursing
- Direct oversight by the operating room governance committee or quality committee
- Medical directorship of perioperative services
- Cross-functional teams including both clinical and non-clinical staff and leadership to develop clinical pathways or protocols. These protocols were sometimes enforced by anesthesiologists

The majority of the more formally-structured organizations had a dedicated non-clinical administrative director or program director in place, such as a "Director of Strategic Initiatives" as described by one participant:

"We hired a director of strategic initiatives who is a non-clinical person, to lead Six Sigma, a process person that we pulled out of the banking industry. We have a clinical person that works with him—or a few nurses—clinical nurse specialists as project manager and an administrative support person. That arm of the practice is our planning phase for the perioperative surgical home. They are in process of doing detailed process maps of a couple of surgical subspecialty procedures, working with the surgical community."

Elements of Care Implemented

PREOPERATIVE CARE

Most programs interviewed were highly involved in preoperative testing and early patient engagement. Anecdotally, this is due in part to the fact that several PSH programs evolved from previously existing preoperative clinics.

FIGURE 2: ELEMENTS OF PREOPERATIVE CARE
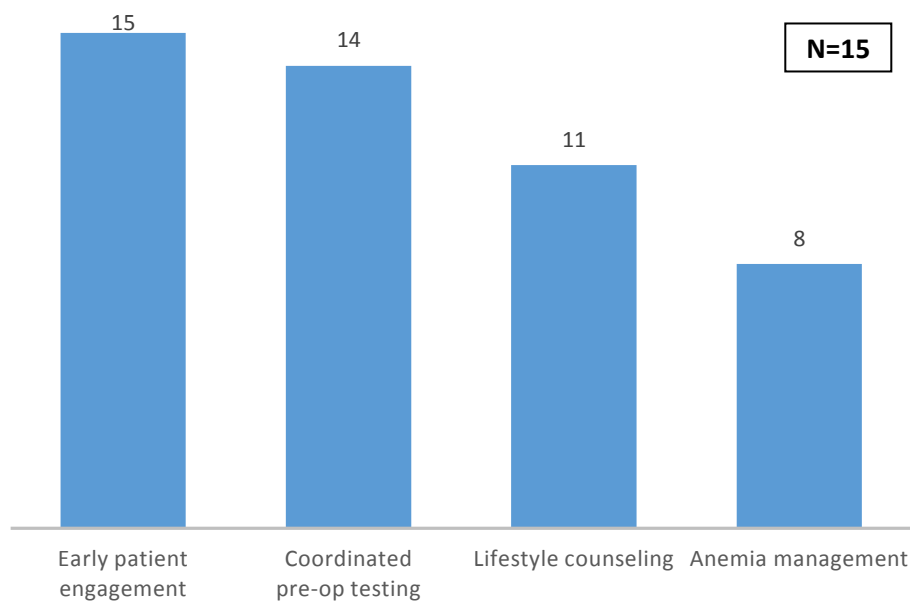
TABLE 4C: OTHER ELEMENTS OF PREOPERATIVE CARE MENTIONED

Additional Preoperative Care Elements	
Testing and Assessment	Seizure assessment
	Patient history
Patient Health Management	Pediatric blood disorder management
	Smoking cessation assistance
	Transition care to primary care physicians for chronic disease management
Communication	Contacting patient the night before surgery
Protocols	Enhanced Recovery After Surgery (ERAS)
	Instituting patient care protocols

INTRAOPERATIVE CARE

13 of the 15 programs had all 7 intraoperative elements mentioned in the interview script. However, several interviewees indicated the anesthesia departments and practices were involved in most of these initiatives outside of their role in the perioperative surgical home; thus, this high prevalence may not be attributable to the PSH.

FIGURE 3: ELEMENTS OF INTRAOPERATIVE CARE
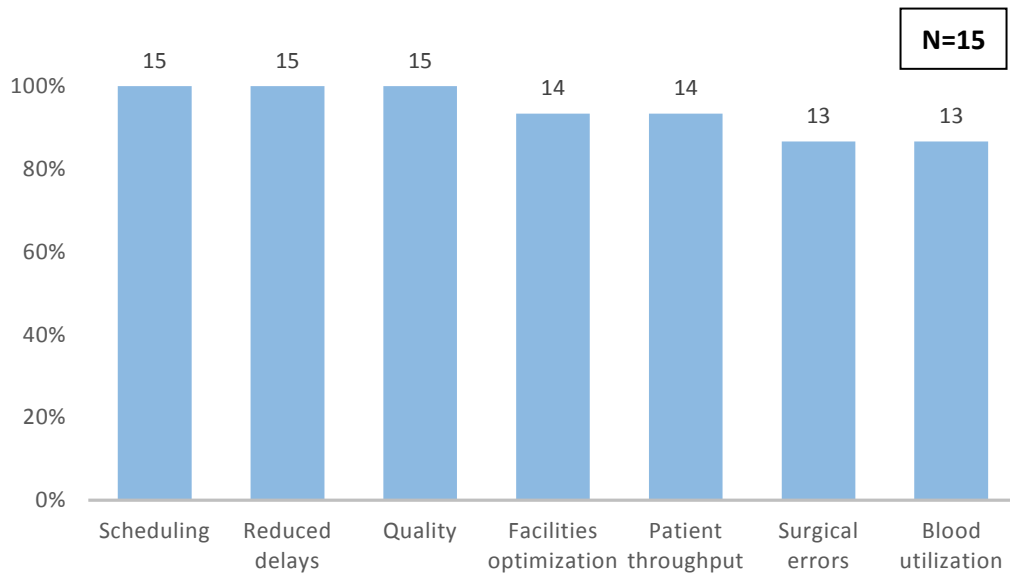
TABLE 4D: OTHER ELEMENTS OF INTRAOPERATIVE CARE MENTIONED

Additional Intraoperative Care Elements	
Operating Room Efficiency	Bed management
	Space management
	Reducing equipment redundancy
	Supply chain management
Safety initiatives	Fire safety initiatives
	Hand hygiene initiatives
Patient care improvements	Pain control
	Medication management
	Initiation of care protocols

POSTOPERATIVE CARE

Generally, the postoperative phase of the perioperative process was the least developed in most PSH programs. Although many interviewees indicated involvement in postoperative pain management, reducing length of stay, and nausea and vomiting protocols, they also indicated that involvement in these elements was due to initiatives external to the perioperative surgical home. Thus, similar to intraoperative elements mentioned previously, much of the anesthesia postoperative involvement may not be attributable to the presence of the PSH program.

FIGURE 4: ELEMENTS OF POSTOPERATIVE CARE

N=15

Post-op pain management	Reducing LOS	Nausea and vomiting protocols	Coordinated discharge planning	Discharge phone calls	Mobility
15	13	12	9	9	6
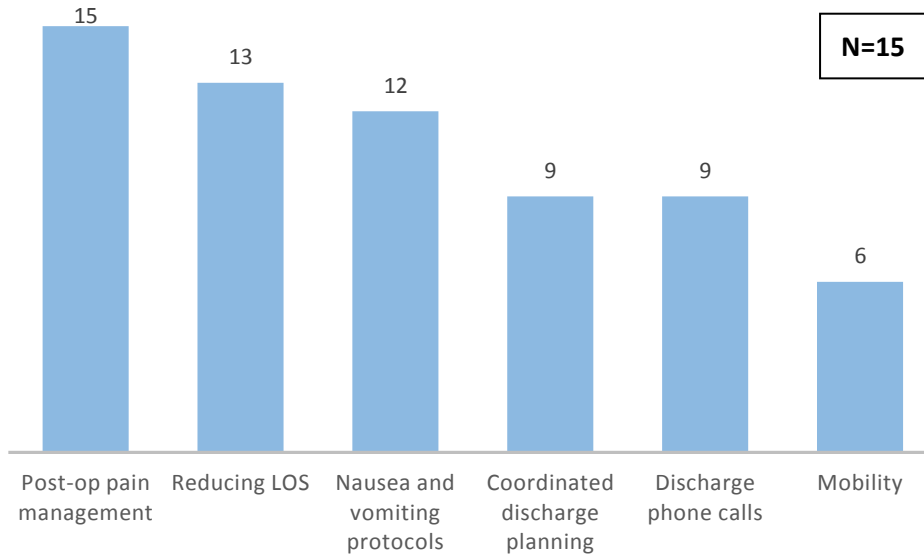
TABLE 4E: OTHER ELEMENTS OF POSTOPERATIVE CARE MENTIONED

Additional Postoperative Care Elements	
Patient care	Regional blocks
	Comorbidity management
Patient satisfaction	Patient satisfaction assessment performed within 48 hours of surgery
OR efficiency	ICU step down

ACUTE PAIN SERVICES

All but 1 program interviewed offered acute pain services of some kind. On average, 2,121 patients received acute pain service per year, with a minimum among the sites of 200 and a maximum of 4,000.

FIGURE 5: ACUTE PAIN SERVICES OFFERED

N=15

Single shot nerve blocks	Epidurals	Consults for medication optimization	Perineural catheters	Home pump catheters
13	13	12	12	11
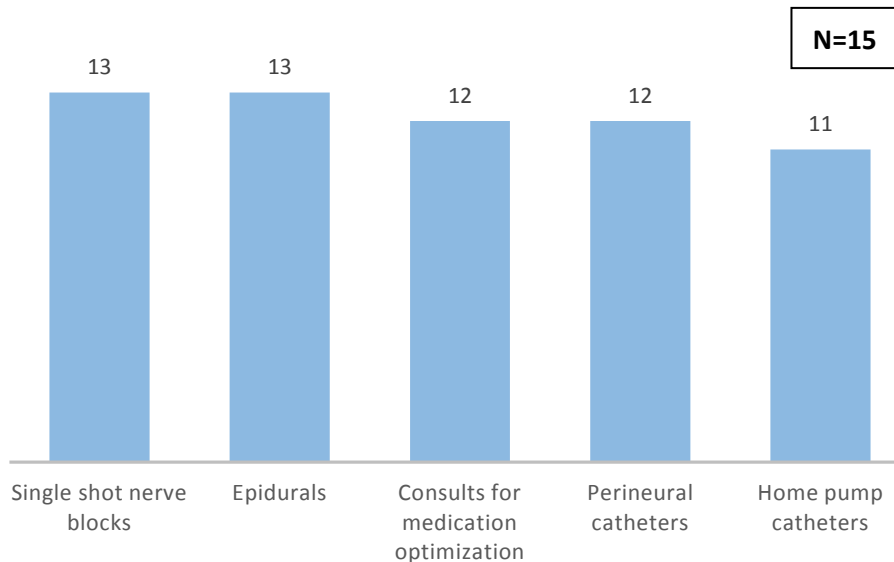
Interviewees were asked to indicate, on a scale from 1 to 10, the importance of the PSH initiative to (a) him or herself, (b) other anesthesiologists in his or her practice, (c) the affiliated healthcare organization, and (d) surgeons he or she worked with (Figure 6).

FIGURE 6: IMPORTANCE OF THE PSH

PSH Program: Patient and Payer Profile

Eight of the 15 organizations indicated that all surgical patients go through the perioperative surgical home process. One organization encouraged all patients to go through the process. The remaining six organizations encouraged certain patients to go through the process based on triage criteria. 63% of the organizations using triage criteria limited the PSH process to patients in certain surgical lines (i.e. urology or joint surgery). 25% limited the PSH process to patients with significant comorbidities, and 13% excluded patients who had undergone a recent procedure.

Nine of the 15 organizations indicated that the PSH program was designed to serve specific patient populations considered to be high risk. This indicates that even in the organizations that enroll all patients in the PSH programs, there are certain procedures in place that provide additional service for patients at higher risk. For example, one organization performs an initial assessment phone call with a CRNA. If, based on this assessment, the patient is higher risk, they come into the preoperative clinic for a complete workup. Lower risk patients are triaged over the phone.

Financial and Administrative Relationship with Healthcare Organization

Financial Relationship with healthcare organization

Almost all organizations (93%) indicated a financial relationship with which the healthcare system they worked most closely. Most interviewees indicated that the presence of a PSH program would either not affect or positively affect this relationship, but one interviewee noted that territory issues and payment uncertainly could jeopardize it.

Of the 15 organizations interviewed, seven indicated that the affiliated healthcare system had participated in Medicare Shared Savings programs, eight indicated the presence of medical homes, and 40% indicated the presence of accountable care organizations.

73% of organizations indicated some ability to obtain facility-level cost data to measure savings from PSH program implementation stemming from decreased cost of testing and drug utilization or staff costs or increased return on investment. Of these organizations, 40% indicated a high level of reporting ability, 20% indicated a moderate level of reporting ability, and 13% indicated a low level of reporting ability. Several interviewees mentioned cost accounting as a significant issue for ability to report data.

Three organizations indicated that their ability to report this data was a result of cost accounting systems, and three organizations indicated that poor cost accounting systems made reporting this data difficult. No PSH programs reported special payment arrangements with any payor groups.

Healthcare Organization Leadership

When asked to describe positions of leadership held by the practice, the most common leadership positions mentioned were committee memberships and medical directorships. Other positions mentioned by multiple interviewees included perioperative services director, chief quality officer, director of pain management, chief of staff, chief medical officer, and OR director.

There seems to be wide spectrum of level of involvement of the anesthesiology departments and programs in facilities and space management, materials management, budgeting, and pharmaceutical cost management across the perioperative process. A few survey participants have described their engagement as minimal and mostly informational and mostly restricted to providing feedback about drug use and cost. Often these activities were performed in an informal way. One respondent described this end of the engagement spectrum as follows:

"We kind of provide feedback on drug use and such and whether it's worthwhile to have a drug formulary getting at cost, et cetera, but that's about it."

Many programs participating in these interviews have described the role of the anesthesiologist by listing various committees the anesthesiologist, the medical director of the perioperative services, or the nurse anesthetist serves on or often chairs. Serving on various committees related to OR management and budgeting for surgery has been a common trend across the programs interviewed. One respondent described their level of committee engagement by saying:

"…we are engaged in full resource management and there is a committee involved in everything from small supplies to large machine purchases that we're a part of."

Respondents mentioned a variety of committees including: Surgical, OR Management, Pharmacy, Therapeutics, Pharmacy Purchasing, Institutional Value-Added, and Purchasing.

The next level of engagement in the operational management spectrum of the perioperative program can be described as the anesthesiologists taking the responsibility for a preoperative clinic and full responsibility for the operations of this clinic. Again, tracking and monitoring pharmaceutical expenses seems to be one of the first building blocks within the preoperative clinic operational management activities.

Finally, there were at least three programs that can be described as most engaged in the whole perioperative management process, including operational management aspects such as space, purchasing, budgeting and more. These programs often have an anesthesiology leader who chairs the institutional committee on perioperative care. One program described their involvement as part of the "Executive Management Group of Perioperative Services", another program shared that their nurse anesthetists is the Perioperative Services Hospital Administrator at the institution. One respondent summarized their full engagement in every aspect of the perioperative management as:

"Completely under control of anesthesia department."

Quality Reporting Information Systems: Practice

All organizations performed some form of external quality reporting. The most common quality measures reported were the Physician Quality Reporting Initiative (PQRI) at 73%, National Anesthesia Clinical Outcomes Registry (NACOR) at 73%, and Surgical Care Improvement Project (SCIP) at 47%. Of the organizations participating in PQRI, 82% indicated a high level of success. The remaining 18% could not comment.

Organizations reported these measures using electronic health records, automatic or manual claims submission, a registry, or some combination thereof. Figure 7 illustrates the prevalence of each of these mechanisms.

FIGURE 7: MECHANISMS FOR QUALITY REPORTING
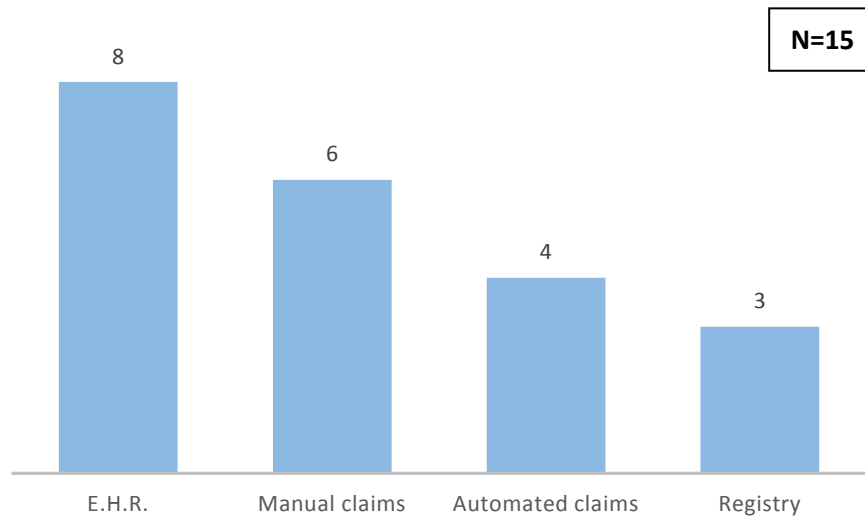
In addition to external quality reporting, several organizations also participated in external benchmarking. Figure 8 illustrates the prevalence of each of these benchmarks.

FIGURE 8: PARTICIPATION IN EXTERNAL BENCHMARKING
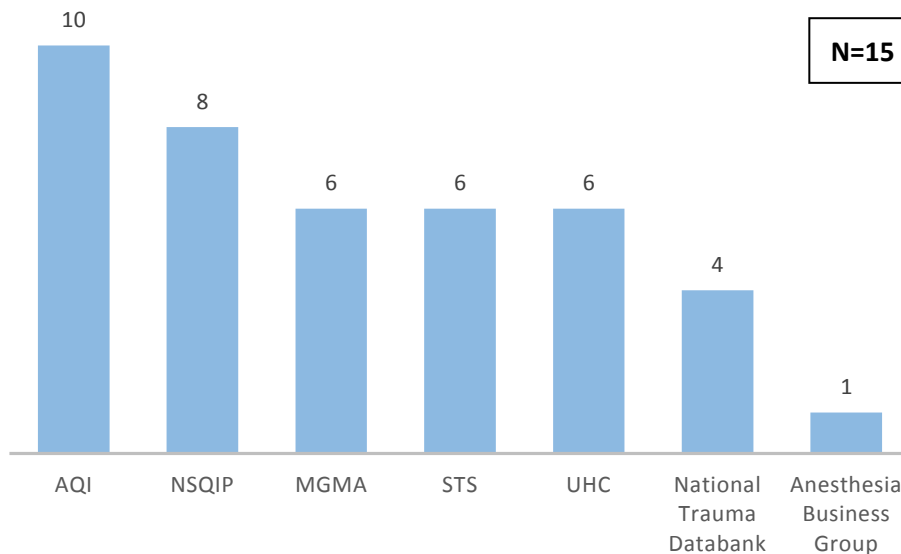
Quality Reporting Information Systems: Hospital

87% of organizations reported that the affiliated healthcare system used electronic healthcare record for all transactions. 79% used an integrated system, such as EPIC, and 21% used a collection of systems. 10 of the 15 organizations (67%) reported having an anesthesia information management system (AIMS), and 5 of the 15 organization (33%) reported having an anesthesia quality outcomes capture program.

The outcomes and quality data available to most practices were generally expansive. 87% of organizations reported having access to historical quality and cost data on preoperative testing, patient satisfaction, physician satisfaction, and intra- and postoperative care initiatives to serve as a baseline for measuring PSH success. 94% of organizations reported having quality data beyond major complications, and 87% had data on postoperative nausea and vomiting, reintubation, and quality of pain management. 47% had access to post-acute functional outcome data for relevant patient segments (i.e. SF-36 or Knee Society Score).

PSH Program: Success Factors, Barriers and Current Environment

PSH Barriers

The discussion of obstacles to and potential challenges in implementing a PSH program resulted in four general themes of common obstacles observed and anticipated. These themes are summarized in the following table and supported by a quote from various respondents who described the nature of the obstacle.

TABLE 5A: CODE COUNTS AND RESPONDENT QUOTES ASSOCIATED WITH BARRIERS TO PSH IMPLEMENTATION

Theme	Description	Respondent Quotation
Finances	This includes the cost of planning for, implementing, and operating a PSH. Also, cost of staffing considerations around anesthesiologist wages, other clinicians, and extenders. Further, administrative costs include staff, IT capabilities, and monitoring activities.	*"Probably, the biggest issue is that we don't really have a mechanism, at present, to fund any of this work."* *"You have economic concerns which is, Is this gonna cost us money? If so, how much?"*
Resistance to Change	People in general have some level of resistance to new innovative approached that have not been proven to help them or their level and nature of work.	*"…kind of change typically scares people and just upsets them."* *"…we're a very large organization of a lot of moving parts. The timeliness of implementing change and the rate at which change is implemented, that has to be considered in judging success."*
Medical Specialty Territory	Potential and observed attitudes of various specialists who are currently engaged in managing their own surgical process (surgical tracks and surgical track specialists), those engaged in preoperative and postoperative care of patients (primary care physicians and hospitalists).	*"…the hospitalists, one of the primary sources of income for them is co-management of surgical patients…This is a direct threat to the livelihood of not the surgeon as much, I think."*

Theme	Description	Respondent Quotation
		"…you have general surgeons and other specialties—cardiac surgery, for instance—that have historically been very insular and very self-reliant. Even when it comes to co-management of cardiac patients postoperative, we are now getting more actively involved in that unit in helping co-manage postoperative cardiac patients." *"Particularly in an academic center. Each of our surgical sections wants to manage the flow of their own patients."*
Lack of Evidence	The lack of a general understanding of the benefits of the PSH, difficulty in showing evidence of ROI, and the challenges of convincing key players to cooperate in this new model of care. Ultimately buy-in seemed to be dependent on the ability to show evidence of specific PSH benefits relevant to the key player	*"You've gotta prove all that, and then you can say, Oh, by the way, since I have managed to streamline my process, and I cut ten percent of the cost out, I think that I, as director of the perioperative surgical home, can get paid for doing that."* *"One of the obstacles we run into is that we've had to go and talk to innumerable administrators, and each one's got their own take on what's going on and their own…"*
IT Capabilities	Difficulties associated with IT processes related to PSH implementation. Key IT issues noted include difficulty translating tools designed by physicians to the IT platforms used to deliver those tools and, on a related note, the time it often takes to implement IT solutions.	*"I think it's primarily one of time and then also much of what we want to do has an IT component to it, and it's very slow to get changes made through IT."* *The only barrier—and I was just talking to one of my nurses—is actually the electronic documentation and collection. As I said, we've created a care coordination tool—a surgical care coordination tool that mimics the medical home tool, and it's actually a challenge to figure out from an IT perspective, how to do that.*

PSH Success Factors

A combination of deductive and inductive content analysis applied to this question. Deductive analysis was performed for the following concepts, which were identified as enablers of PSH implementation when developing the interview script:

- Culture of patient safety or accountability
- Focus on patient experience and satisfaction
- Organizational leadership (support)
- Organization is ready for change (organizational capacity for change)
- Professional care team shows readiness for change
- Effective people engagement
- Information technology capabilities
- Clinical and process capabilities

Inductive analysis resulted in additional concepts identified by the respondents as important enablers of PSH implementation, such as:

- Small scale demonstration pilot
- Surgeon experience and satisfaction
- Effective communication of PSH benefits to: hospital C-suite, surgeons, and other anesthesiologists
- Access to IT capabilities aligned with PSH goals and processes
- Access to relevant information from administrative and clinical IT systems

Table 5B: Code Counts and Respondent Quotes Associated with Enabling Factors for PSH Implementation

| PSH Implementation Enabler	Code Count	Respondent Quotation
Organization Leadership (Support)	17	*"What also helps in these different areas are the proponents are willing to stick their neck out and do the extra work it takes to make things happen."*
Patient Safety (Accountability)	15	*"I think the culture of patient safety and accountability is a key one. We realize our ad hoc approach to the O.R. and each surgical section and anesthesia division doing their own thing. It provides us with the best safety and accountability. Now we've got that under the umbrella of a perioperative home."* *"We're gaining a lot more traction and safety and quality and value. In fact, Fist Name Last Name, who's the center director, has point two FTE of an anesthesiologist dedicated to the center doing quality and safety work and point two of a surgeon and O.R. personnel."*
Surgeon Experience (Satisfaction)	13	*"Probably, it's either the surgeons who take whatever work they can and get it off their plates, in terms of getting their patients prepared and ready. They're definitely interested in us taking ownership of resource issues, because it's less for them to do."*
IT Capabilities (aligned with PSH goals)	11	*"The IT side cuts in both directions. The demands for IT support far outstrip the resources we had to provide, so at times, IT could be helpful, and at times, IT could be a hindrance of moving forward."*

PSH Implementation Enabler	Code Count	Respondent Quotation
Clinical Process Capabilities	9	*"Access to information management systems: I think that's important. There are still plenty of private practice groups that have yet to adopt an electronic medical record in the OR."*
Communication of PSH Benefits	9	*"I think being able is—for implementation success is always communication, communication, communication. It'd have to be directed communication that—in which you learn what is—where the sweet spot is for each component of the organization, whether it's the financial, the administrative—the CEO was very excited about this as an innovative, transformational project, so talking to him in very broad terms about innovation—he's thrilled with that."*
Organization Ready for Change (Capacity)	9	*"Certainly, the culture is ripe for it. The organizational leadership is there. The organization is moving ahead on putting in other methods to improve a change…"* *"Organizational leadership is important or very important. Organization is ready for change. Our CEO really likes to emphasize disruptive innovation. "*
Patient Experience (Satisfaction)	5	*"Focus on patient experience and satisfaction: I think that's hugely important."*
People Engagement	5	*"The people engagement effective manner has been key."*
Small-scale Demonstration Pilot (show benefits)	2	*"When we've been able to use the cottage industry or we started doing it on a small scale and people are happy with the results. "*
Payment Model Aligned	2	*"…there are discussions still at this moment of time the payments for these services, the services, or the pay for the health employees. For them to say, "Hmm. I won't get paid, but I have to do something," is still foreign concept.*
Professional Team Ready for Change (Capacity)	1	No quotes available.

14 of the 15 organizations indicated the presence of institutional, departmental, or colleague support for the PSH program. Several interviewees indicated the support of one or two groups, but not the other (i.e. institutional and colleague but not departmental support).

Opportunities to Add Value
The majority of organizations (67%) were able to work with facilities to negotiate with device and pharmaceutical vendors, and several indicated involvement with pharmacy standardization practices, as depicted in Figure 9 below.

FIGURE 9: PHARMACY STANDARDIZATION PRACTICES
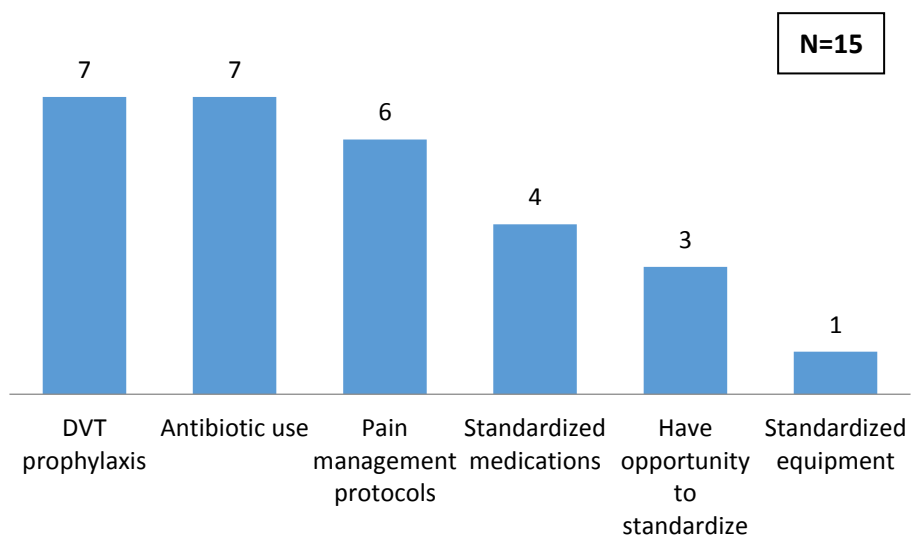
13 of the 15 organizations (87%) were able to work with facilities to improve patient flow, discharge, and length of stay initiatives to reduce costs, and all but one of these organizations was able to measure cost and length of stay impact from these initiatives.

Respondents described additional opportunities for enhanced anesthesia involvement that would lead to measurable differences in cost and quality as part of their PSH initiative or program. Overall, all programs were planning to expand aspects of preoperative and postoperative activities and focus services more on target populations by disease category, surgical specialty, or patient age. Most respondents mentioned the role of the anesthesiologists as the key leaders in perioperative management and coordination. There is also a common theme of penetrating PSH model into more surgical specialties beyond orthopedics for example. Specific emerging themes of future opportunities for anesthesia were identified as follows:

1. Preoperative Opportunities for Growth:
   - Risk assessment protocols development by target patient segment
   - Expanding services in preoperative clinic (target segment specific)
2. Intraoperative Opportunities for Growth:
   - Efficiencies
   - Pharmacy cost
   - Turnover time
   - Materials utilization
   - Demonstration of increased surgical service value
   - Use of mid-level providers (PAs and NPs)
   - Development of care protocols

3. Postoperative Opportunities for Growth:
   - Comprehensive pain services
   - Postoperative protocols; transitions of care (ERAS)
   - Transitions of care: patient home
   - Transitions of care: primary care physician
   - Medication management
   - Ability to predict complications/early deterioration
   - Anesthesiologist as the first responder to signs of early deterioration

Organizational Structure and Change

The respondents identified staff primarily responsible for implementing preoperative and postoperative aspects of the perioperative surgical home at the hospital/practice as follows:

1. Anesthesia staff (majority)
2. Multidisciplinary group of surgeons, anesthesiologists, nurses, hospital administrators (one program)
3. Anesthesia staff for preoperative; surgeons and anesthesiologist co-management for intra- and postoperative (one program)
4. Unknown – to be determined (two programs)

Finally, almost all practices indicated involvement with change management methodologies. The most commonly used technique was Lean (12 of the 15 organizations), followed by Six Sigma and PDSA.

PSH Program Performance

Respondents were asked to identify things that their PSH program does well and share some of the PSH successes with the interviewer. Many respondents were excited to report that the program is able to capture and demonstrate performance through the metrics used. One respondent summarized the overall theme of responses very well by identifying what their PSH is successful at achieving as follows:

"Patient satisfaction, surgeon satisfaction, administration and health plan satisfaction, and anesthesiologist satisfaction. Cost reduction and high efficiency."

Table 6A is a detailed summary of codes, code counts and corresponding quotes for this question:

TABLE 6A: STRENGTHS OF INDIVIDUAL PSH PROGRAMS

Code Name	Code Count	Respondent Quotation
Perioperative care coordination	7	*"Our program is more global than that. Not just standardization of care for an ICD code or a specific procedure. It is basically global perioperative management of the patient. No matter what procedure they're having."* *"It does what it's supposed to do. It coordinates the care across the spectrum and delivers a good package."*
Patient satisfaction	7	*"We're also really good at coordinating care so that patients actually don't have to keep coming back many, many times. We try and coordinate all of their medical appointments in advance of their preop visits so that we can actually have that information with us before we actually see the patient."*

Code Name	Code Count	Respondent Quotation
Surgeon satisfaction	6	*"I think what we've been very good at doing is collaborating with our surgical colleagues and helping them to understand why all of this is important and if patients are cancelled, why they're canceled and what the surgeons can do to help to get them rescheduled."*
Use of metrics to demonstrate value	5	*"Well, I think what we're doing well now is we're—we are demonstrating the value of integrated care and the value of having an anesthesiologist involved in the preoperative preparation of the patient and our input in that arena. I'd say that's the biggest thing."*
Preoperative evaluation	4	*"I think we're really successful at coordinating and optimizing the patient all different aspects before surgery so that we can influence the clinical outcomes and the financial efficiency of the operating room."*
Reduced cost of care	4	*"I think the bottom line is it reduces costs and it maintains or improves patient satisfaction and surgeon as well, once they buy in."*
Increased efficiency in OR management	3	*"Recently, one of our Green Belt projects was around the amount of time it takes to get a patient processed—just redid all of our preoperative processing on the day of surgery in our main hospital facility shows dramatic decrease in the time it takes to get patients ready."*
Postoperative pain management	3	*"I think we do exceptionally well at stratification through acute pain management services, and we have a very high-risk, chronic pain population coming into surgery here. We're very busy with that. We have good interventions on multimodal approaches, what have you. Even for those patients that may not be candidates for regional-type pain."*
Patient safety	2	*"I also think that consolidating everything centrally has had a significant impact on improving our safety value."*
Communication among care team members	2	*"I think we're good at providing information to our practitioners about how they're doing, and have open and frank discussions on opportunities for improvement."*

Respondents were then asked to identify aspects of their PSH program that are different unique when compared to other programs. Many interviewees had difficulty answering this question, as the PSH is still a relatively new concept. Some of the more frequent responses included:

1. Being a part of a fully integrated or non-fully-integrated system
2. Being led by anesthesiologists
3. More or less experienced than many other PSH programs
4. Increased focus on patient engagement and a holistic approach

Key informants identified resources (e.g. experienced, professional quality management personnel) available within the (PSH program to measure patient experience, cost and quality performance and clinical outcomes (Table 6B).

TABLE 6B: QUALITY MANAGEMENT HUMAN RESOURCES

Code Name	Code Count	Respondent Quotation
Hospital-wide team	10	*"We have access to that Center for Clinical Excellence which has staff with these skillsets. If we want to measure something, I would work with the Center for Clinical Excellence."*
Anesthesia-based team	5	*"Well, at the anesthesia practice, we actually have a team that are not clinical, not anesthesia providers that are working on this project, and that's a process person and a clinical person—a clinical background, a clinical nurse specialist that's not practicing clinic."*
Anesthesia-based team working closely with hospital	3	*"We have a great relationship with the health system, and so they have a whole department of quality and safety. They have what's called the value institute which is a whole research arm of the institution. We have access to all of those resources."*
No resources currently available	3	*"No, not yet do we have resources there to do that."*

Then, the respondents identified the process(es) employed when someone involved in the perioperative chain of care makes an error that detrimentally affects patient safety (i.e. providing the wrong medication). Responses were as follows:

TABLE 6C: RESPONSE TO PATIENT SAFETY ERRORS

Code Name	Code Count	Respondent Quotation
Formalized process – quality assurance	9	*"Well, we have a robust quality reporting system. We have a patient safety system that's confidential for reporting, and it triggers internal or multi-departmental review if necessary."*
Formalized process – sentinel events	5	*"We have what we call a SERS report, which is Serious Event Reporting System. It's an electronic system whereby anything that is out of the ordinary, whether there's patient harm or not, gets reported in the SERS system, and it actually is not really meant to be punitive."*
Review by quality assurance leadership	4	*"There's a hospital multi-specialty practice evaluation committee that has groups of physicians evaluating near misses or misses, and looking to whether there's things learned from those."*
Review by department leadership	3	*"We have a patient safety system that's confidential for reporting, and it triggers internal or multi-departmental review if necessary."*
Root cause analysis	3	*"Oh, we do a root cause analysis, which is a very formal process that involves discussions, meetings, so I would say root cause analysis. That's our usual practice."*
Culture of patient safety	1	*"This institution is very big on what's called the culture of responsibility, and this program…It's called culture of responsibility. It's a non-punitive, blameless way of assessing situations in which to determine whether the person has—was this human error, or was this a reckless behavior or somewhere in between where it was just sort of an at-risk behavior, somebody cut a corner, and determine whether there were system pressures that had this person select an at-risk behavior. Was there a knowledge that—so on. There's a whole algorithm you can walk through."*

Code Name	Code Count	Respondent Quotation
Alerts in medication ordering system	1	*"We have a lot of pop-up alerts on our PICCs. When you're ordering medications, if you're ordering outside of the normal range for weight, there's an alert that pops up in the electronic system. In addition, if the patient has an allergy or a contraindication to a drug or a drug-drug interaction, when you actually go to order that in your electronic system, an alert will pop up, and you have to consciously override it."*

PSH and Future of Anesthesiology

Interviewees were asked to rank the importance of PSHs and similar initiatives to the future of anesthesia on a scale from 1 to 10. The median was 10, and the minimum was 7. Thus, most practitioners indicated consider perioperative care management to be highly important to the future of the specialty. See below for respondent quotes in response to this question.

"I believe that delivery of quality anesthesia services is just a bare minimum entry requirement into this game. You can hire a lot of people who can deliver quality anesthesia at the bedside, at the level of the patient-provider interaction. It's what you do outside the bed that counts, so I think that this is critical to the success of the specialty as maintaining a relevance in the medical community at large."

"We are positioned, and we do have good skills in systems management, and using those skills in a collaborative way, we have a very important role to play—not necessarily the only role, but we are well-positioned to encourage improvement, quality, and efficiency just—and the way we've done it here is, it's moving that way. Everyone's pulling in the same direction. We have a lot of leadership roles because of our skills in system management that not necessarily all other physicians have. That doesn't mean we should be doing what the hospitalists do. That doesn't mean we should be doing what the surgeons do."

"I would add to that that a lot of the things or concepts in the preoperative home are things anesthesiologists, in varying degrees, already do. I think the value of the PSH concept is in bringing more of a structure to it, a stance, a branding."

"There's this tremendous disconnect between what we do in the operating room and what the primary care physicians can evaluate. Only the anesthesiologist can really make that connection, so I think on one hand, it has to elevate and enhance our presence outside of the OR because we really are in the perioperative business. We're not necessarily in just the intraoperative business and, again, we have to coordinate the medical care outside the OR with the risk of the procedure inside the OR."

"I think it's the nature of what healthcare has to be. I think it's bigger than anesthesia. I think it is. All physicians all have to play a part in the whole system and can't just be working in their specific, traditional area of expertise. From that regard, it is absolutely critical."

APPENDIX: COMPREHENSIVE LITERATURE REVIEW

RESEARCH APPROACH

For the comprehensive literature review, the researchers employed three means of article retrieval: 1) a comprehensive search of available literature using PubMed and Google Scholar using a broad set of terms to maximize sensitivity, 2) reference crawling of all selected articles, and 3) articles provided to the research team by the ASA contact person. Then, researchers reviewed the abstract and methods section of each paper to determine if the contents of the paper fit the selection criteria for one or more of the seven enumerated topic categories related to the perioperative surgical home:

1. The perioperative surgical home concept
2. Early patient engagement
3. Reduced preoperative testing
4. Intraoperative efforts to improve efficiencies
5. Postoperative care initiatives
6. Reduced postoperative complications
7. Care coordination and transition planning

This process yielded a total of 125 peer-reviewed articles. The ASA provided an additional 28 peer-reviewed articles for a combined 153 peer-reviewed articles at the end of the first phase of the literature review.

In January 2014, this search and evaluation process was replicated to identify and include articles published since August 2013. This yielded 21 new peer-reviewed articles. Additional suggestions by the ASA and other interested parties after the first phase of the literature review yielded 20 peer-reviewed articles.. The process was repeated in May 2014. Searches yielded 19 new peer-reviewed articles, and suggestions from ASA yielded 15 new articles, bringing the total number of peer-reviewed articles to 228.

In addition to the search of the peer-reviewed literature, researchers performed a search of the non-peer reviewed literature using Google and searches of the ASA website for the term "perioperative surgical home." In August 2013, these searches yielded 21 results and were combined with 7 non-peer-reviewed sources suggested by the ASA. In the January 2014 update, 9 sources were added (4 from web searches and 5 suggested by the ASA), bringing the total number of non-peer-reviewed sources to 35.

KEY FINDINGS

The literature review findings were classified into one or more of the seven categories listed above.

1. The perioperative surgical home concept

The concept of the PSH is the product of several decades of development, beginning with the conception of the patient-centered medical home and the perioperative process in the 1960s, continued with the emphasis on surgical quality through the NSQIP program and the development of ERAS and fast-track surgery guidelines in the 1990s and 2000s, and finally formalized through the emphasis on perioperative care coordination by the healthcare system. In recent years, the role of the anesthesiologist in particular has been evaluated and emphasized as the key leader of these care coordination efforts.

2. Early patient engagement

This topic focused primarily on preoperative risk assessments and prehabilitation programs. Generally, prehabilitation programs were found to be successful, while the evidence on the usefulness of preoperative risk assessment was mixed. Many studies, including several European studies as well as a major Medicare study in the US, have demonstrated that reducing preoperative testing can yield significant cost savings.

3. Reduced preoperative testing

Most literature indicates that current preoperative testing practice is excessive. There is evidence that preoperative testing improves clinical outcomes, but significantly more evidence that preoperative testing is costly and ineffective at predicting complications or improving outcomes. For example, one study found that minimizing unnecessary preoperative testing could reduce nationwide healthcare costs by $10 billion while potentially improving patient experience and care (Brown and Brown 2011).

4. Intraoperative efforts to improve efficiencies

Most studies in this arena focused on scheduling, surgical, or technological interventions that improved OR flow. Most of these of initiatives, including redesigning OR routing processes, guidelines for delay reduction, and perioperative OR setup, were successful at increasing efficiency and/or improving patient experience.

5. Postoperative care initiatives

ERAS programs have improved postoperative care, decreasing complications and accelerating discharge from the hospital. New types of anesthesia have also been introduced that facilitate similar outcomes. Other research has focused on how the PSH can be staffed to provide more personalized postoperative care.

## 6. Reduced postoperative complications

Reduced postoperative complications have become a high priority for many hospitals given the recent changes in the payment environment. There have been various successful efforts to reduce complications, including methodologies like ERAS, surgical quality data sharing initiatives such as NSQIP or the Michigan Surgical Quality Collaborative, and the use of a preoperative risk assessment when warranted.

7. Care coordination and transition planning

ERAS programs emphasize care coordination more than previous surgical models. Other attempts to improve care coordination include telephone follow-up by nurses or the use of e-health platforms, in which patients can interact with a personalized care plan to assist patients and caregivers with postoperative care management.

In an effort to identify factors that enable healthcare providers to dramatically improve quality of care, the Institute of Medicine (IOM) and its Committee on Quality of Health Care in America have deployed and co-funded experts in the fields of innovation, quality improvement and healthcare microsystems to study teams and inter-organizational efforts toward better care quality outcomes since the mid-1990s. A recent technical report of this IOM committee defines and describes various healthcare microsystems and identifies characteristics that enable specific healthcare microsystems to improve the quality of care

provided to their respective patient populations (Molla and Mohr 2001). Based on the descriptions of various PSH and PSH-like models described in the literature, the researchers identified the PSH as a 'clinical microsystem' to guide further research efforts, including primary data collection approach. In theory, clinical microsystems are "the places where patients, families, and caregivers meet – the places where care is delivered and where outcomes and costs are produced" (Nelson et al. 2011). The perioperative surgical home fits the definition of a healthcare microsystem, as the PSH is where care is planned, delivered, and managed; outcomes are achieved; and various providers meet patients and family. We applied the healthcare microsystems model developed by Nelson et al (2011) to frame the perioperative surgical home (Figure 1).**FIGURE 1. THE PSH AS A CLINICAL MICROSYSTEM**

Source: Adapted from Nelson et al. (2011)
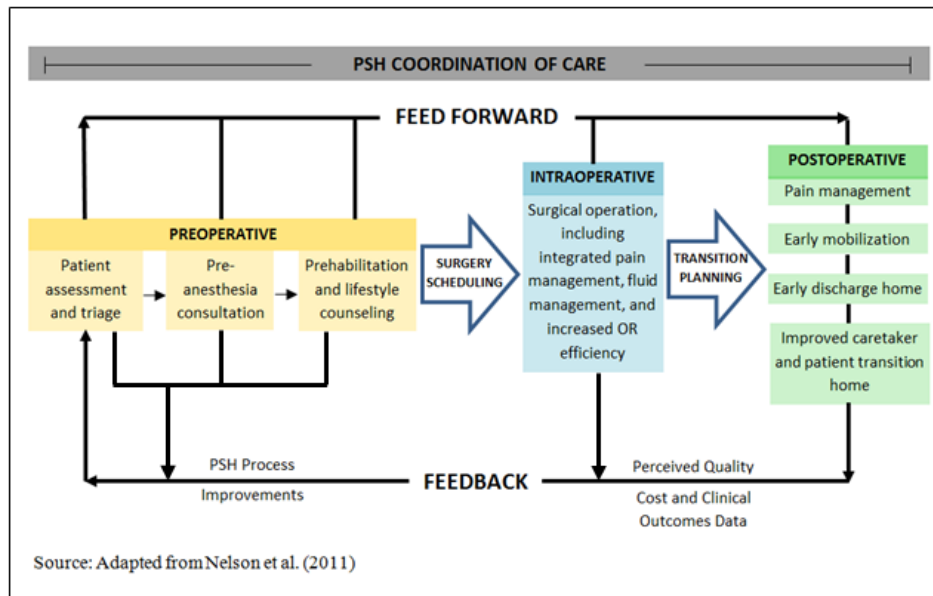
For more information, a full copy of our literature review findings is available to ASA members on the ASA website:
https://www.asahq.org/~/media/For%20Members/hpr/PSHLitReviewJan2014UpdateFinal.pdf

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