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A Comprehensive Medication Management Liaison (CMML) Process Framework for Expanded Interdisciplinary Day-Surgery Teams

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Abstract

Implementation science (IS) in the field of surgical care can help with adoption of evidence-based strategies, prevent and manage adverse events, and facilitate high quality medical care. This could be challenging in same day or outpatient surgery settings however. This research letter explores factors in developing a framework to address medication adverse events using CMML with anesthesiology and expanded interdisciplinary outpatient surgical teams. The six-month qualitative study involved interviewing key informants on managing a case example of a perioperative anesthesia adverse event, utilizing Roger's Diffusion of Innovation Theory as a theoretical framework. Emergent codes and themes pertained to awareness and knowledge of the problem significance, qualifications, empowerment, and financial viability of the proposed liaison role. CMML was found to be valued by study participants with safety and cost-effectiveness implications. Still, CMML adoption would require addressing leadership motivators and barriers, multidisciplinary credentialing and engagement to enhance IS research capacity. Key consideration points for implementation are Pre-Admission and Recovery, Internal Medicine consults, Anesthesiologist accessibility, Patient Education, Interdisciplinary Communication. Implementation should build upon existing effective organizational processes, with a framework of Regulatory, Workforce, and Fiscal pillars for IS strategy success.

Keywords: Adverse Event, Collaborative Care, Implementation Science, Patient Safety, Surgery, Value-Based Care.

INTRODUCTION

Implementation Science (IS) in surgical care can research strategies to incorporate evidence-based interventions for high quality clinical practice and population health [1,2]. Medications are implicated in many adverse events (AE)s in surgical settings [3]. Joint Commission National Patient Safety Goal [4] standards include optimal medication use safety and health care worker (HCW) communication to promote health service quality. While initiatives exist to enhance surgical quality and analyze AEs in electronic event reporting systems [3,5,6] this may be less clear in brief day or outpatient surgery with communication challenges across in-house and contracted health providers. We proposed a CMML role as part of an IS process framework for enhancing team communication and safety outcomes using a broad collaborative care model of detailed pre- and postoperative check-ins for day surgery patients. Our study aimed to examine factors of CMML model feasibility and conceptual design.

METHODOLOGY

This prospective, 6-month qualitative, observational and case study with Institutional Review Board (IRB) approval involved semi-structured, qualitative interviews of multidisciplinary key informants on the course of care of a case of suspected anaphylaxis during perioperative anesthesia which caused an Emergency Department visit and inpatient hospital admission. Tracing AE management and sharing perspectives for potential CMML team coordination within the case and in relation to outpatient surgery were utilized to assist concept development, using knowledge and persuasion stages of Roger's Diffusion of Innovation [7] as a theoretical framework. Participants had expertise or community working relationships with inpatient and outpatient health care, surgical facilities, and higher educational institutions across the Arkansas Delta. The AE case was from outpatient surgery in an out-of-state multi-hospital system.

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The purposive sample of 17 participants were recruited by snowballing via regional health care networks, interviewed by investigators (VO, MV, AA, AW) and a preliminary list of codes generated. Investigators (VO, AA) transcribed interviews while investigators (VO, MV, AA, AW) reviewed and analyzed the data with subsequent inductive, open, and focused coding. With each coding cycle, core concepts were identified, taking into account the frequency of appearance, new information, and related concepts categorized. With data saturation achieved, a final set of codes and themes was devised. The data was then analyzed (BW, CO, EG), and by external content and qualitative reviewers. Interviewee disciplines included Surgeons; Medicine and Health Sciences Faculty; Internal Medicine Physicians; Nurse Practitioners; Clinical and Staff Pharmacists; Certified Registered Nurse Anesthetists; Surgical and Health Administrators (Inpatient, Outpatient Surgery, Quality Assurance, Nursing, Pharmacy); Medical and Pharmacy Residency Coordinators.

RESULTS

Table 1 summarizes qualitative themes, while a conceptual illustration for CMML planning is shown in Fig. 1. Communication was identified as a primary issue with patient safety and AEs. CMML was considered important, even vital, in promoting communication and knowledge, health service quality, value and cost-effectiveness. Enthusiasm was mixed however, for implementation. Workload and financial sustainability were raised as the greatest barriers to adoption, leaving existing qualitative assurance strategies as the status quo. The emergent CMML implementation model had regulatory, workforce and fiscal themes.

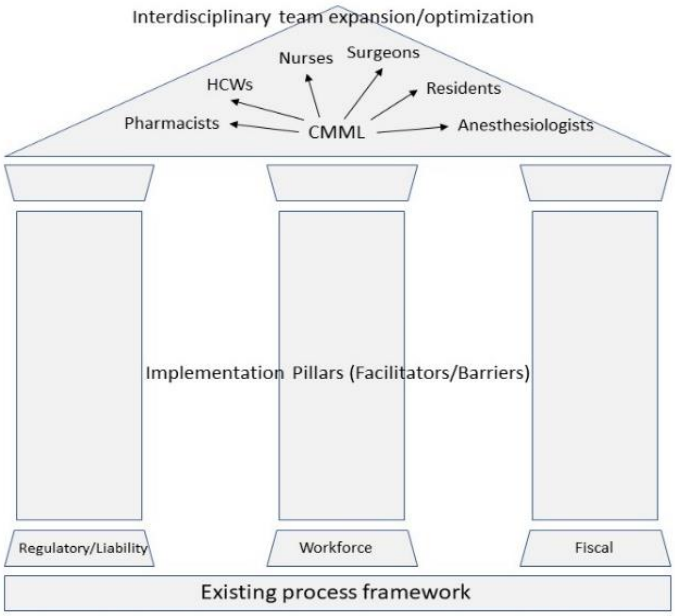

Figure 1: An Interdisciplinary Day Surgery CMML Planning Framework

Table 1: Qualitative Codes and Themes

Theoretical Framework: Roger's Diffusion of Innovation		
Knowledge	**Persuasion**	**Other Key Concepts**
Billable services	Fiscal	Autonomy
Qualifications, Skills	Interprofessional	Communication
Phamacoeconomics	Liability	Patient Advocate
Problem significance	Quality	Touchpoints
Scope of Practice	Return on Investment (ROI)	Value
Provisional Theme: What is the 1) Importance, 2) Qualifications, 3) Empowerment, 4) Financial Viability of a proposed CMM Liaison role as key factors for successful adoption of the innovation		
Categories:	**Quote Examples**	**Coding Notes**
Significance Communication Liability Medication Use Patient Safety Problem Significance Quality Touchpoints Transformational Leadership Value	"1st dose medication oversight is done by the pharmacist with allergy screens, that doesn't happen in outpatient" "Innovation inertia", "Input is valued, whether by scrub tech or surgeon", "verbal report OR to PACU", "This role is VITAL!" "1st dose allergy screens only done with overnight surgical procedures" "We evaluate services done in other areas and do research over it that is presented to administration" "Biggest issue is intra-department communication" "Multiple layers of safety"	Pre-Admission, Pre-Surgery, Pre-Screening, PACU, Quality Assurance, Family Education & Support, Post-Op follow-up, Interprofessional teams, patient advocate, touchpoints, Recovery unit, Immunology Screen/Panel, Pre/Peri/Post-Op observation beds in PACU or Recovery units, EMR integration with contracted anesthesiology, contact with anesthesiologists with questions, peri-surgical events – communication to recovery unit personnel, , establish or quantify the cost of the problem, fragmented care delivery, connect, post-operative complications, employee input, patient communication just as important as health professional communication, internal power struggles may discourage speaking up, lukewarm/mixed incentive, Antibiotics, Antihypertensives, medical history on admission, value analysis team, Patient Safety Surveys, TEAM-STEPS, organization-wide re-training, debriefing, IT, Care gaps: getting too comfortable with team members,

		taking each other or processes for granted, consistent access to current hospitalist contact numbers, political will for changes
Qualifications Competency Critical Care Credentialing Expertise Training	"Clinician=Health care professional"	Interprofessional teams, Disease state protocols, PharmD consults, ADR assessment, P&T Committee report, Student IPEs, Early/Prehealth professionals, Family Education training, Competence, Anesthestic pros and cons, trust, safety, patient advocate, Internal Medicine or Attending Physician, Surgeon, Anesthesiologist, Breathing tests, Allergy screening – skin testing or comprehensive allergy testing criteria, CMM liaison role with medication and/or anesthesia expertise, surgical team make-up ≥3 members (e.g. MD, DO, RN, CRNA, PharmD), protocols, evidence-based medicine committee
Empowerment Accountability Autonomy Interprofessional Teams Responsibility Safety (Multiple layers) Trust	"Physician, Surgeon and Anesthesiologist trust are important", "Interdisciplinary sign-off: At least 3 professionals…verbal report OR to PACU" "Anesthesiologists check out at noon, then good-luck!" (reaching them) "It's a medical management responsibility" "Surgeons are responsible" (for AE management) "We could use an OR pharmacist" "Should be a dedicated role requiring very delineated tasks" "Medical management is medical management" "A lead from every discipline meets together" "Contracture test is a painful and invasive muscle biopsy"	Interprofessional teams, P&T Committee report, trust, accountability, multidisciplinary sign-off, CMM liaison decision can't be overridden, interprofessional power dynamics, Medical Management responsibility, Some Surgeons stop using Internal Med physicians who don't readily give a sign-off, PharmDs absent from outpatient surgery; mainly focused on staff education and allergy screens for overnight surgeries, teamwork, enhanced standards, communication liaison role emergence from COVID pandemic, philosophical disagreements and pressing towards consensus
Fiscal Viability ROI Value-Based Care (unreimbursed) Value-Based Reimbursement Volume-based Reimbursement	"We're paid by DRGs" "When is overnight stay justified clinically or financially for day surgery"? "eating" the cost of a surgical procedure and AE, "Pre-Admission testing as a Medical Management service" "Concerns can be escalated to Administration, though the need is rare" "Pre-Op pressure is more than discharge pressure (sign-off)", "Pre-Op cost-effectiveness evaluation based on age (e.g. <25 vs >45 years), workload and manpower shortages. "Pre-admission is a billable platform" "Tough sell to administration unless it generates revenue"	Student IPEs, Early/Prehealth professionals, Volume-based billing, Fee-for-service, Value-Based Reimbursement, DRGs, incident-to billing, CPT codes, ED admissions, hospital transfer-out, CMM liaison as a paid role, not assigned tasks of another job position, quality assurance research role, ADRs prevented, malpractice case reduction, ED admission reductions, reduced hospital readmissions, establish or quantify the cost of the problem, pharmacoeconomic analyses, Inpatient Medical service can bill outpatient unit (e.g ED consults), utilize medical residents and students, pessimism of appreciated value of ADR costs prevented, fee-for-service
Theme(s): Core factors identified promote healthcare stakeholders' interest. Varied perspectives exist with the enthusiasm or lack thereof to determine CMML initiation and proceed forward with the adoption of new process ideas/innovation. Balancing patient safety, surgical care quality, advocacy, institutional resources, cost, revenue.		

DISCUSSION

Comprehensive Medication Management (CMM) is an evidenced-based care standard to optimize patient medication experiences and clinical outcomes [8]. Care is coordinated among providers and across systems of care as patients transition across different healthcare settings. Implementation of a CMML role could help to introduce or optimize this standard of care in the outpatient surgical setting. It was considered very important and aligned with Joint Commission regulatory guidelines for high-quality outpatient surgical care. The conceptual CMML implementation model was designed with 3 core components or pillars, building upon existing institutional strengths while incorporating new evidenced-based ones.

Medication AEs may occur as immediate or prolonged anesthetic reactions with outpatient procedures. CMML may help with communication and team responsibilities by having a more detailed system of pre- and postoperative check-ins with outpatients. Barriers to adoption were particularly with anticipated workload and facility cost for new programs. Successful IS strategies require stakeholder engagement and funding [2] such as increasing awareness of the benefits in a manner which allays stakeholder concerns and distinguishes implementation of evidence-based interventions from quality assurance or improvement. While quality improvement does facilitate health-system safety and quality, an implementation process framework could promote successful execution of an intervention [2] recognized as valuable. Generation of discrete billing codes accepted by insurance companies and/or negotiations on value-based care would be a useful step in adoption of CMML in surgical settings.

CMML implementation was envisioned as requiring a team-based approach with HCWs having clearly delineated tasks and accountability. Some HCWs are often absent from outpatient surgical teams. The proposed role was recommended from Pre-Admission through Post-Discharge, however, key touchpoints were Pre-Admission screening and PACU debriefing. One perspective considered CMML a global approach that any organization should invest in for patient safety. Another perspective considered it vital and clinician-specific, yet not feasible for implementation without the capacity to generate new revenue. It was however recognized that the role could still be implemented and limited to targeted populations based on risk factors or specified protocols. Reimbursement knowledge for new service

implementation was based on experience, concept development or idea acquisition from other institutions and presentation to administrators for adoption. Motivators and barriers to adoption included: Awareness of surgical AE significance, CMML qualifications, role empowerment to effectively promote patient safety, and fiscal viability with measurable outcomes. The codes were distilled to determine emergent themes.

Implementation Enablers - reimbursement; existing infrastructure in place to build upon (eg. Medicine consults, Medication history teams, Quality Assurance review processes).

Implementation Barriers - distracted/overwhelmed by other priorities; unfamiliarity with health service reimbursement processes; lack of familiarity with different HCW credentialing/scope of practice.

Successful implementation of a CMML role may require autonomy, accountability, medical management consults in pre-admission and post-operatively, value and volume-based care ROI, and expansive interprofessional teams. Patient education and HCW communication are priorities. Engaging interprofessional learners with investigating CMML health services research afforded opportunity for exposure to valuable skills and competencies. Further research is suggested to explore financial and legislative factors, interdisciplinary team pilots. An implementation model utilizing existing HCWs with further specific training, specific billing codes or value-added services to improve financial feasibility would be viable directions for future research. The implications may benefit health services quality and cost-effectiveness.

Our work contributes to the field of surgical IS studies to include outpatient surgical care with broader interdisciplinary teams. Rather than common existing processes such as Surgery ordering a Medicine consult for allergy/history screening and clearance, limited medication reconciliation, limited HCW credentialing or primarily Quality Assurance documentation of AE occurrences; a conceptual model of multidisciplinary credentialing and expanded team inclusion within the existing processes to address workload, regulatory, and cost-effectiveness factors was designed. While it was considered important to have one designated professional at a time for CMML accountability, the pool of HCWs trained for sustainable services could be expanded. Medicine and most health professional programs have accreditation standards that include interprofessional education and collaborative practice (IPECP) training [9,10]. This work reflects one implementation strategy for meeting such higher education requirements, and expanding the scope of physician and nonphysician expertise [2] in the surgical IS field.

CONCLUSION

This IS qualitative study examined processes and leadership engagement considerations for a proposed CMML role to reduce and prevent AEs events pre/post-operatively in day surgery settings. CMML was considered highly valuable for high-quality outpatient surgeries, but successful implementation requires stakeholder engagement to address facilitators and barriers.

CMML was mostly described as a value-based, team-based role with HCWs having clearly delineated tasks and accountability. The proposed role was recommended for Pre-Admission through Post-Discharge, however, key touchpoints were Pre- Admission screening and PACU debriefing. It was however recognized that the role could still be implemented and limited to targeted populations based on risk factors or specified protocols. Motivators and barriers to adoption of the innovation was determined from the literature contextual framework and qualitative coding: Awareness of surgical AE significance, CMML qualifications, role empowerment to effectively promote patient safety, and fiscal viability with measurable outcomes. Engaging interprofessional learners with CMML health services research afforded opportunity for exposure to valuable skills and competencies. Further research is suggested to explore innovation inertia, financial and legislative factors, interdisciplinary team pilots. The implications may benefit health services quality and cost-effectiveness.

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Author's contributions

VO- Study design, participant interviews, qualitative coding and thematic analysis, data dissemination, manuscript development. AA- Qualitative coding and thematic analysis, data dissemination, manuscript development. BW- Qualitative thematic analysis, manuscript development.

Conflicts of interest

None declared.

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