

Perioperative Care of Cholecystectomy Clients
A Quality Improvement Analysis

By

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Abstract

TITLE: Perioperative Care of Cholecystectomy Clients
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An interdisciplinary Quality Improvement study at a suburban community hospital was conducted to determine and rates of compliance with JCAHO standards for perioperative nursing care, and the perioperative complication rate for five types of cholecystectomy procedures performed at the facility.

Medical records of 295 patients undergoing either laparoscopic cholecystectomy (LC), laparoscopic cholecystectomy converted to open cholecystectomy (LC-conver.), laparoscopic cholecystectomy with additional procedures (LC+), open cholecystectomy (OC), or open cholecystectomy with additional procedures (OC+), from October 2, 1991 through September 29, 1993, were reviewed retrospectively for documentation of perioperative complications, such as intraoperative bleeding, retained gallstones, wound infection, postoperative pulmonary problems, postoperative bile leak, and others.

Additionally, medical records were reviewed for documentation required for compliance with JCAHO

standards for perioperative nursing care related to the following; assessment of self-care needs, documentation of sponge and needle counts, intraoperative monitoring of patient surgical position, and preoperative patient education.

The rate of perioperative complications for all types of cholecystectomy was, 9.6%. Complication rates for procedure types were; LC 5.3%, LC converted to OC 38.9%, LC with additional procedures 15.4%, OC 20.0%, OC with additional procedures 27.3%. The results demonstrate that complication rates for LC converted to OC, and OC with additional procedures, exceed rates reported for OC. The complication rate for LC+ was within the range reported for OC. The results demonstrate the perioperative complication rate is within that reported in the literature, 2-11% for laparoscopic cholecystectomy and 4-21% for open elective cholecystectomy (Deziel et al, 1992, Ress, et al., 1992, Meyers, 1991).

Compliance rates with perioperative nursing standards were; self-care needs 35.3%, sponge and needle counts 96.3%, intraoperative monitoring of patient position 100.0%, and preoperative patient education 77.2%. The threshold for improvement for nursing actions was 90%. Compliance rates were within an acceptable range for two of the four standards evaluated.

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CHAPTER 1

Introduction

An interdisciplinary Quality Improvement (QI) investigative project was conducted at a suburban community hospital to determine complication rates of cholecystectomy and compliance rates with Joint Commission on Accreditation of Health Care Organizations (JCAHO) standards related to perioperative patient care. The clinical process related to patient care was analyzed to obtain this information. The project was identified as a clinical process improvement opportunity, and was developed following JCAHO guidelines. The project was designed to serve as an administrative report to the Directors the of Surgical Services and Quality Improvement Departments.

The goals of the project were to determine the rate of compliance with JCAHO standards related to perioperative medical and nursing care, determination of perioperative complication rates of cholecystectomy patients in a particular health care setting, and to identify opportunities for improving patient care.

Compliance with JCAHO standards is necessary to maintain JCAHO accreditation. Noncompliance could cause loss of accreditation which in turn may lead third-party reimbursement agencies to refuse to pay for treatment

rendered to patients (Pozgar, 1993). Furthermore, compliance with standards assures that patients receive care that is consistent with a quality upheld in the health care industry.

According to JCAHO, the quality of performance of the clinical process (includes nursing and medical care activities) directly affects the quality of patient outcomes. Operative procedures, such as cholecystectomy, are among the high risk, high volume interventions at the facility as well as essential components of care, and are among the priorities for performance by an organization (Accreditation Manual, 1994, Section 1 pg.1)

Laparoscopic cholecystectomy, a new surgical technique introduced nationwide in 1989, (Meyers, 1991) was implemented at the facility in 1991. Due to the newness of the procedure, it was selected by the Quality Improvement and Surgical Services Departments for investigation to determine level of performance with a new technology and to determine if performance was within the range reported in the choleystectomy studies conducted in other practice settings.

The complete investigative project contains medical and nursing elements. Medical elements are; surgeon, assistant, type of cholecystectomy procedure, procedure length, pre-and post-operative anesthesiology assessment,

readmissions, and unplanned transfers to another unit postoperatively. The nursing element includes documentation of; self-care needs assessment, surgical sponge and needle counts, intraoperative monitoring of patient position, and preoperative patient education.

The focus of this study is the perioperative complication rate, and the nursing element of the project. The study questions are:

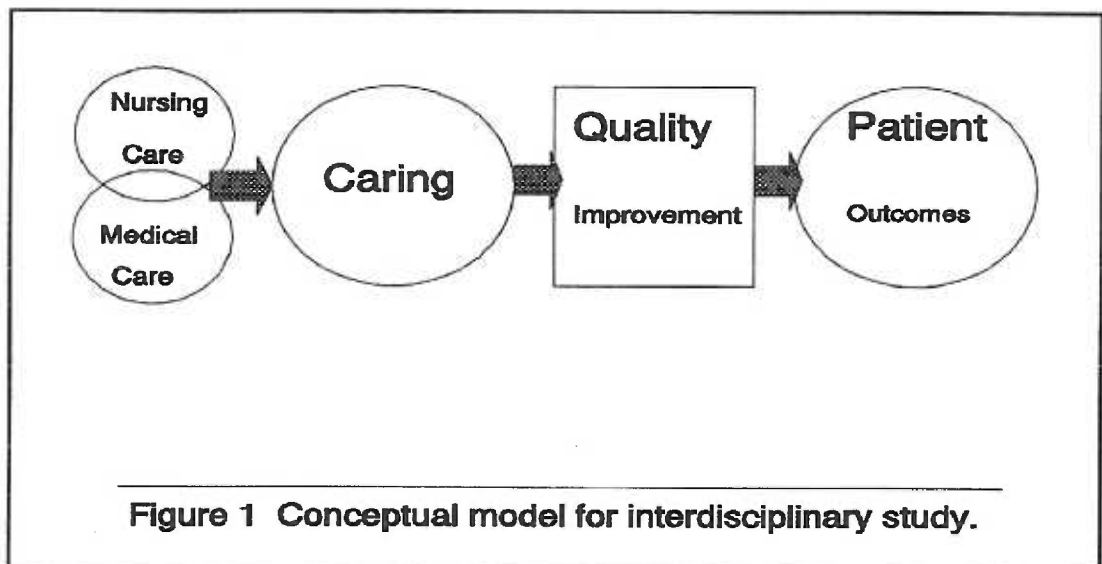
1. What is the overall rate of compliance with JCAHO perioperative nursing care standards related to: self-care needs assessment, surgical sponge and needle counts, intraoperative monitoring of patient position, and preoperative education, compared to a threshold of 90% for corrective action?
2. What is the rate of compliance with JCAHO perioperative nursing care standards related to: self-care needs assessment, surgical sponge and needle counts, intraoperative monitoring of patient position, and preoperative education, compared to a threshold of 90% for corrective action for each of the five procedure types for cholecystectomy?
3. What is the overall perioperative complication rate for cholecystectomy at the facility?
4. What is the rate of perioperative complications for each procedure type for cholecystectomy at the facility?

The study will increase knowledge about the quality of the performance of the perioperative clinical process, including medical and nursing care. The importance to nursing is that it will provide information that will allow nursing leaders to make judgements about the quality of nursing care delivery at the facility, and to determine if performance is at a level that meets accepted standards of practice. If care is not performed well, patients can be placed at serious risk (Howery, 1994). It will provide information about the perioperative complication rate at the setting. It will permit the hospital to compare clinical process performance and complication rates with similar health care settings. The study results will contribute information to the Joint Commission indicator monitoring system database, an external reference database.

CHAPTER 2

Conceptual Framework

The concepts of caring and quality improvement are the conceptual bases for the study. The effect of caring that is based on quality improvement is reflected in improved patient outcomes. Elements of caring include patient care activities provided by medical and nursing professionals that improve and maintain patient's health status. Furthermore, the quality of performance of patient care activities directly effects the quality of patient outcomes (Accreditation Manual, 1994, Section 1 pg.1). Patient outcomes are the result of the performance or nonperformance of patient care functions (Howery, 1994). Quality improvement, currently labeled as Continuous Quality Improvement, is the result of a total quality program, is built on ongoing monitoring, and is focused on improvement. A conceptual model is illustrated in Figure 1.



Variables for the investigative project fall into three categories: 1. physiological characteristics, 2. medical health care actions, 3. nursing care actions. The latter two categories encompass care activities provided by nursing and medical health care professionals, that, according to Leininger (1977), are elements of professional caring. "Professional caring includes behaviors, techniques, processes and patterns that improve and maintain health" (Chinn, 1991). Additionally, Leininger states that, "caring is the essence of nursing and is the most central and unifying focus for nursing decisions, practice and goals" (Burnside, 1988). Furthermore, improvement of health status outcomes through improvement in performance of an organization's systems and processes, (includes the clinical process-nursing and medical care) such as care of the patient functions, is the aim of quality improvement activities, (Howery, 1994) and is consistent with Leininger's statement about professional caring.

Selection of the nursing variables studied was based on the Joint Commission's idea of the link between the performance of the clinical process, of which nursing care is an element, quality, and patient outcomes. Nursing variables selected were process related, and consisted of documentation of the following; assessment

of self-care needs, surgical sponge and needle counts, intraoperative monitoring of patient position, and preoperative patient education. The JCAHO literature states the effect of an organization's performance (defined as what is done and how well it is done to provide health care) including the clinical process, is reflected in patient outcomes. Additionally, patients and others judge the quality of health care based on patient outcomes such as perioperative complication rates (Accreditation Manual, 1994, Section 2, pg 1). When the performance of the clinical process meets or exceeds standards, it leads to improved patient outcomes.

Review of the Literature

The idea of quality assurance was introduced into nursing, thirty years ago, and has become an integral part of nursing care. Quality assurance programs focused on organizational structure and the impact on patient outcomes. The current focus is quality improvement. Quality improvement efforts focus on functions and processes, and is both process and outcome oriented and identifies ways of continuously improving the overall quality of an organization's activities and services, including nursing (White, 1993). Process elements of QI include; organizational functions, functions of medical staff, nursing, administration, and governance, as well

as care of the patient functions.

The nursing care variables being evaluated for Quality Improvement (QI) are linked with JCAHO standards. These standards are models of established practice that are commonly accepted as correct (Howery, 1994). The goal of a nursing practice standard is to describe a level of nursing care and professional performance common to all nurses. Additionally, standards are used as a reference for performance measurement for QI programs (Howery, 1994).

For purposes of this study, the decision was made by the interdisciplinary team to use documentation in the medical record related to nursing and medical care standards as evidence of performance. This was in keeping with a JCAHO guideline that organizations consider what evidence will most accurately and clearly indicate its level of performance in meeting the intent of JCAHO standards. Documentation of the medical record is among sources of information reviewed by JCAHO that are considered evidence of performance (Accreditatiion Manual, 1994).

Documentation of self-care needs assessment addresses a JCAHO standard related to nursing assessment on admission, of patient's self-care needs related to activities of daily living, which was the intent

of JCAHO standard NC.1.2 (Accreditation Manual, 1994, Standard NC. 1.2). This standard has been translated in intent to Standard PE.1.4 for 1994 (A. Dixon, Associate Director Department of Interpretation, JCAHO, personal communication, December 2, 1994). However, due to the time period in which the nursing care took place (1991 to 1993), the intent of NC.1.2 is an appropriate application of this standard.

The exception is that the nurse will consider the patient's full spectrum of needs, including self-care. Self-care needs assessment is done to support the goal to encourage patient involvement in her/his own care, thereby promoting recovery and speeding the return to independent functioning. Moreover, assessment and identification of patient needs are bases for determining types of care provided, and for discharge planning.

Orem (1971) states that self-care is the continuous contribution by a person to her/his own health and well-being. When this ability is lost, it results in a self-care deficit, and a subsequent need of nursing. The nurse then assumes the role of self-care agent and focuses nursing care actions to meet the self-care demand (Rourke, 1991). Documentation of self-care needs assessment is JCAHO evidence of performance of quality nursing care that addresses patients individual needs,

assists patients towards higher levels of functioning, and results in improved patient outcomes.

Perioperative nursing care is addressed in a JCAHO standard that requires a qualified registered nurse to plan patient care, and assess and manage patient safety needs during the surgical experience (Accreditation Manual, 1994, Standard OP.4). The intent of this standard has not changed for 1994, and is applicable to nursing care practices during the study time frame. The literature identifies accurate accounting of sponges and needles used during surgery as a critical patient safety need. Sponge and needle counts are required on all types of cholecystectomy procedures, and are a responsibility of intraoperative patient care (Zuffoletto, 1993). This action is taken to avoid complications from the unintended retention of a foreign substance in a human body such as; infection, adhesions, bowel obstruction, fistulas, aseptic encapsulation, and others (Rappaport, & Haynes, 1990). Sponge and needle counts, if not performed well (accurately), can place the patient at serious risk.

Sponge and needle counts documentation is one of the ongoing QI monitors in the Surgical Services Department at the study site. Ongoing monitoring of this aspect of care is a JCAHO requirement. It falls in the category of

processes that are measured on a continuing basis which affect a large percentage of patients, and /or place patients at serious risk if not performed well (Howery, 1994). Documentation of sponge and needle counts is evidence of performance of patient care directed at a safe surgical outcome (Spry, 1990, Murphy, 1990).

Monitoring of patient position is another dimension of patient safety that is addressed by a JCAHO standard requiring intraoperative monitoring of the patient, and is among the ongoing Surgical Services QI monitors (Accreditation Manual, 1994, Standard OP. 4.2). This standard has not been revised for 1994, consequently, the intent of this standard is applicable for the period which this study investigated. Due to complications that can arise from improper positioning, monitoring of the patient while positioned for surgery, is essential to patient safety (O'Neale, 1990). Accountability for intraoperative positioning is shared with surgeons and anesthesiologists. However, the usual practice is that this is the circulating nurses' responsibility (Groom, Frisch, 1989). The literature reports complications arise from improper positioning including, flexion contractures of spine and neck, nerve damage, pressure point injuries, damage and irritation of the skin, corneal abrasions, hyperextension injuries, compression of vessels which may

lead to ischemia, aspiration, and pulmonary complications (Alexander, Burley, Ellison, Vallari, 1992, Walsh, 1993). Correct positioning is essential to patient safety, and documentation provides evidence of monitoring of patient safety, and effective, quality, nursing care.

Another important perioperative nursing action is preoperative patient education, which is measured by documentation by nurses that it has occurred. This action is linked to a JCAHO standard, that is relevant for the time frame of the study, requiring that patients receive education specific to the appropriate procedures and the their relevant health care needs (Accreditation Manual, 1994, Standard PF.1).

Literature reviewed discloses that information regarding routines, perioperative experience, and the potential impact surgery will have on activities, reduces anxiety and prepares patient for what to expect during hospitalization and after discharge (Page, Beresford, 1988). Preoperative education specific to cholecystectomy minimizes the risk of wound infection and pulmonary complications and leads to improved patient outcomes.

Cholecystectomy, both laparoscopic (LC) and open (OC), is an important therapeutic intervention, however it imposes the risk of complications to patients. LC is a relatively new technology, and needs to be evaluated

for efficacy and safety. It has been widely adopted as a treatment for gallstone disease since 1989 (Steiner, et al., 1994). Common intraoperative LC complications reported in the literature from studies conducted from 1985 to 1992, include; bile duct injury (the most common complication reported), vascular and bowel injury due to trocar placement, bowel injury due to electrocautery or laser burns, bile leakage, gallstone loss, and puncture site bleeding (Deziel et al., 1993, Meyers, 1991, Ress, 1993).

Common postoperative complications include delayed bile leak (Soper, 1993), and intra-abdominal hemorrhage. Indirect complications include; wound infection, postoperative ileus, urinary retention and pulmonary complications. Pulmonary complications and fever are much less common after LC than after OC (Strasberg, et. al., 1991).

Complications of conventional or open cholecystectomy reported were; biliary injury or leakage, hemorrhage, or infection (Meyers, 1991). The literature reports that most of these complications are iatrogenic, and related to the operative technique (Strasberg, 1992). In reference to laparoscopic cholecystectomy, Ress states that, "bile duct injury reflects the surgeon's inexperience, technical difficulties, aberrant biliary

anatomy, or poor judgment during the application of this new technique to the broad spectrum of pathology associated with biliary calculus disease. Complications may not always imply inadequate technical skills but rather the inherent limitations of video-visualization (two dimensional viewing)" (Ress, 1993).

For purposes of this study, the complication rate evaluated was primarily a result of physician performance which ultimately influences subsequent nursing care, as well as patient outcomes. Perioperative nursing care given is based on the patient's response to surgical intervention. When patients experience complications such as hemorrhage, infection, and pulmonary problems, nursing care is directed at minimizing their effects.

The literature supports that the variables analyzed in this QI study address important aspects of nursing and medical care, and that patient outcomes are impacted by the quality of care they receive. It is documented by studies that serious complications can be prevented by accurate sponge and needle counts, and monitoring of patient position intraoperatively. The importance of preoperative education in reducing patient anxiety, infection, and pulmonary problems related to cholecystectomy has been supported by the literature also. The nursing literature reviewed on the subject of

"self-care" supports that, assessment of patients for self-care needs is important to patient outcomes as it is directed at promoting a faster return to independence after an episode of illness.

Studies reviewed on risks related to laparoscopic cholecystectomy stress that the complication rate is often surgeon performance related due to the newness of the procedure, and that evaluation of the complication rate is important to determine improvement as experience increases. The literature related to open cholecystectomy mentions that these procedures also involve the risk of complications, and that tracking the complication rate is important to ascertain if it is in a range that reflects quality of care. Furthermore, the JCAHO literature reviewed strongly recommends QI monitoring of processes, such as medical and nursing care, and outcomes, such as perioperative cholecystectomy complication rates, to determine if performance is at an acceptable level, and to ensure improved patient outcomes.

CHAPTER 3

Method

The setting for this study is a 150 bed, acute care, non-profit, independent, community hospital located in the Portland, Oregon suburban area. Average surgical caseload is 375 persons per month. The service area encompasses metropolitan, suburban, rural, and migrant populations.

Sampling Plan

The population is comprised of five distinct client groups who have undergone one of the following types of cholecystectomy procedures at the facility over a two year period between October 2, 1991 and September 29, 1993. These five types are; laparoscopic cholecystectomy (LC), open cholecystectomy (OC), LC converted to OC (LC-conver.), LC with additional procedures (LC+), and OC with additional procedures (OC+). The population is the entire aggregation of patients undergoing cholecystectomy at the study site during this time period. Consequently, there has been no sample selection, or control for bias in population selection. Population subgroups are shown in Table 1..

Table 1.Population Subgroups

Procedure Type	M		F	
	%	#	%	#
LC	14.6	43	64.1	189
OC	1.4	4	2.0	6
LC-conv.	2.7	8	3.1	9
LC+	3.7	11	4.4	13
OC+	0.7	2	3.1	9
Total		68		226

N = 295, one missing observation

LC=laparoscopic cholecystectomy

OC=open cholecystectomy

LC-con=laparoscopic cholecystectomy converted to OC

LC+=laparoscopic cholecystectomy with additional procedures

OC+=open cholecystectomy with additional procedures

The sample size is 295 clients (68 males and 227 females). This skewed sample towards females is specific to the problem, and is consistent with the literature. Delayed gallbladder emptying as a result of smooth muscle relaxation from hormonal factors, may lead to stasis of the bile, resulting in cholelithiasis and associated cholecystitis, and may account for the higher incidence in this group (Price and Wilson, 1986). Sample characteristics for this study are shown in table 2..

Table 2.Characteristics of Population

	M	%	F	Entire % Population
No. of Pat.	66	22.8	223	77.2 289
Ave. Wt./lbs	186.9	----	170.4	---- 178.7
Wt. range	88-324	----	98-388	---- 88-388
Ave. age/yrs	56	----	46	---- 51
Age range	21-93	----	11-93	---- 11-93

Research design

The study is a retrospective investigation of perioperative complication rates, and nursing care actions related to cholecystectomy. It is a descriptive study with no manipulation of independent variables. Perioperative complication rate was compared to that reported in the literature. Nursing care actions related to cholecystectomy were measured against a 90% compliance threshold for corrective action for nursing care standards.

Data Collection and Instrumentation

Data collection was conducted within a timeframe required by the facility. It occurred in conjunction with data collection from other disciplines. Raw data were initially collected from patient's medical records. A

computerized list of cholecystectomy clients' medical records numbers was obtained from the Operating Room Scheduling Office System (ORSOS) database in the Surgical Services Department (ORSOS, 1985). The charts on the list were pulled by the Medical Records Department and reviewed. The data were transferred to a data collection instrument developed for this purpose. The instrument was formatted with columns containing headings for the eighteen investigative project variables, medical record numbers, and dates of surgery. The variables were; surgeon, assistant, procedure type, ASA acuity rating, type of complication, gender, returns to surgery within thirty days of original procedure with related complications, postoperative transfers to another unit, documentation of self-care needs assessment, documentation of preoperative education, peroperative anesthesia assessment, documentation of sponge and needle counts, and documentaton of intraoperative monitoring of patient position.

Documentation of self-care needs assessment, intraoperative monitoring of patient position, sponge and needle counts, and preoperative education are aspects of nursing care addressed in this paper, and are part of the variables for the entire project. A copy of the form can be found in Appendix A.

The data collection instrument was developed specifically for this study, therefore no reliability and validity assessments were conducted. There is a degree of content validity regarding the item of "complications." Complications listed were what the population experienced and are supported by consensus in the literature on studies conducted on cholecystectomy patients (Delziel, et al., 1992, Meyers, 1991, Soper, et al., 1993). In addition, selection of particular complications to analyze was based on the opinion of experts involved with this interdisciplinary study. There is a degree of content validity regarding the nursing care items as well. Selection of these variables for evaluation was based on the link with JCAHO standards.

Medical records at the facility are maintained with an identifying number rather than patient name to ensure confidentiality. Data collection was conducted primarily by a registered nurse selected by the facility's Quality Improvement Department director. The investigator and members of other disciplines were involved in data collection as well. There was no structured data collection training. However, individuals involved in data collection were experienced in medical record documentation and review by education and professional practice. The study falls within the exemption category

45 CFR 467.101 (b) (4) for research on human subjects. Permission to review the medical records for purposes of this study was granted by the Director of Medical Records. A copy of the memo is included as Appendix C.

Methodological problems

Methodological problems included the inherent limitations with the use of secondary data from records in that biases, and the completeness or accuracy of the information cannot be independently verified. This was controlled by clarification with the practitioner involved in documentation when feasible.

Difficulty was encountered with the need to transfer data from the Excel format to SPSS format for statistical analysis. SPSS offered a broader array of analysis, but required some editing of the Excel spreadsheet printout prior to transfer to a disc for SPSS. A recommendation would be to enter data onto a SPSS spreadsheet initially.

CHAPTER 4

Results and Discussion

Data analysis procedures involved use of SPSS computerized statistical package. The majority of data were nominal scale and consisted of frequency counts. Categories were mutually exclusive and collectively exhaustive. The data were analyzed for frequency of occurrence in each category. Data were crosstabulated to illustrate comparison between variables, to obtain frequency counts, percentages, and to determine feasibility of chi square testing depending on expected frequency values for cells. Rates of compliance with perioperative nursing care standards were calculated. The overall perioperative complication rate, and complication rates for the five types of cholecystectomy procedures were determined. Results of rates of compliance with standards as well as by procedure type can be seen in Table 3..

Table 3.Rate of Compliance (%) per Procedure Type and Overall

Variable	Overall	LC	OC	LC-con	LC+	OC+
Self Care Needs	35.3	36.2	10.0	38.9	26.9	45.5
Sponge & needle count	96.3					
Intraoperative monitoring of patient position	100.0	100.0	100.0	100.0	100.0	100.0
Preoperative patient education	77.2	83.0	40.0	55.6	73.1	36.4

LC=laparoscopic cholecystectomy

OC=open cholecystectomy

LC-con=laparoscopic cholecystectomy converted to OC

LC+=laparoscopic cholecystectomy with additional
procedures

OC+=open cholecystectomy with additional procedures

What is the rate of compliance with a JCAHO standard related to self-care needs assessment overall and for each of the cholecystectomy procedure types? The results show compliance with standards was below the 90% threshold for corrective action for nursing care activities overall and for each of the procedure types. Documentation of self-care needs was measured by evidence of documentation on the nursing admission form used with each patient admission. Overall compliance rate for self-care needs documentation on the entire population was 35.3%. Documentation rates of self-care needs of patients

for each procedure type are summarized in Table 4..

Table 4

Self Care Needs Assessment

Type of procedure	Documented %	Documented #	Percent of population	# per type of procedure
LC	36.2	83	77.9	229
OC	10.0	1	3.4	10
LC-conv.	38.9	7	6.1	18
LC+	26.9	7	8.8	26
OC+	45.5	5	3.7	11
Totals	-----	103	100.0	294

LC=laparoscopic cholecystectomy

OC=open cholecystectomy

LC-con=laparoscopic cholecystectomy converted to OC

LC+=laparoscopic cholecystectomy with additional procedures

OC+=open cholecystectomy with additional procedures

The low compliance rate for documentation of self-care needs can be explained in part by the lack of a mechanism for documentation of this content of the assessment on the nursing history and assessment form in use during the study period. The nurse performing the assessment had to remember to include this content and chart it elsewhere on the medical record. This may have been perceived as a time consuming, additional task. Revision of the assessment form to include this topic

would trigger attention to this area, and facilitate documentation. However, in emergent situations, or with critically ill patients, assessment of self-care needs may not be a priority or may otherwise be inappropriate which would impact documentation rates. The higher rate of documentation related to OC+ compared to other types of procedures may be due to a difference in length of stay and subsequent longer nursing time with inpatients compared to extended day surgery (not more than 23 hours in the facility).

What is the rate of compliance with the JCAHO perioperative nursing standard related to documentation of sponge and needle counts overall and for each procedure type? The results support that documentation rate (96.3%) for sponge and needle counts is within the range of substantial compliance with standards (91% to 100%). This variable was measured by evidence of documentation on the operating room nursing record. Compliance with standards for this aspect of care should be 100%. An exception was one subject (.3%) out of the 295 that did not have documentation of the sponge and needle count. For ten of the patients (3.4%), a sponge and needle count was documented as not applicable, which may account for the lower than 100% compliance rate.

Th documentation rates for sponge and needle counts

show substantial compliance with standards. The lower than 100% compliance rate was impacted by selection of the "not applicable" option on the flow sheet for ten surgical patients. Other choices for sponge and needle count documentation are, the "correct" and "incorrect" options. Sponge and needle counts are required on all types of cholecystectomy, consequently, the medical records of these ten patients should be reviewed further to clarify the choice of the "not applicable" option.

What is the rate of compliance with a JCAHO perioperative nursing standard related to intraoperative monitoring of patient position overall and for each cholecystectomy procedure type? The rate of documentation/compliance was 100% overall and for each procedure type. This variable was measured by evidence of documentation on the operating room nursing flow sheet of position type, use of safety straps, placement and type of positioning device used, and padding of pressure points.

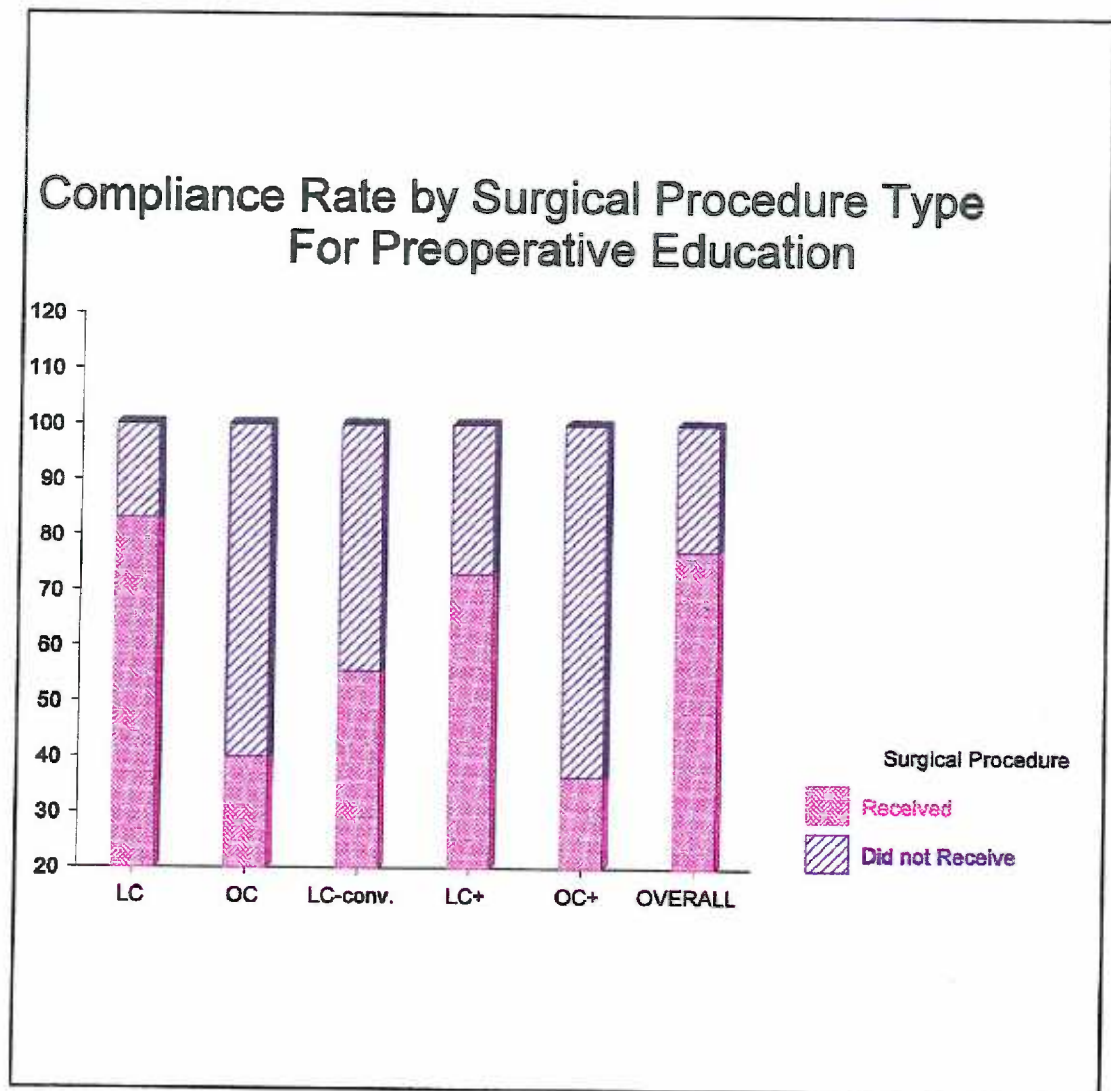
Results support substantial compliance with standards for this aspect of care, and indicate that all patients were monitored for safe surgical positioning. The operating room nursing flow sheet check box format was well designed to facilitate documentation for surgical positioning. The flow sheet in use at the time

addressed all essential aspects of patient positioning common to surgical procedures, which ensured thorough documentation. Documentation rates are reviewed periodically to determine if compliance with standards is maintained, results are communicated to staff, and corrective actions are recommended when necessary. Although 100% compliance is a desirable finding, it cautions nurses to be continually vigilant in performing this intraoperative duty to prevent patient complications or injuries.

What is the rate of compliance for a JCAHO nursing standard related to preoperative patient education overall and for each procedure type? The results show the overall rate for documentation of preoperative education was 77.2%. Documentation rate for each procedure type was; LC 83%, OC 40%, LC converted to open cholecystectomy 55.6%, LC with additional procedures 73.1%, and OC with additional procedures 36.4%. Measurement of this variable was obtained by review of the nursing admission record for documentation of preoperative teaching, which includes; education related to surgical preps, the pre-op routine, turning, coughing, and deep breathing, the post-operative routine and post-operative pain. The results demonstrate that the overall rate of documentation and the documentation rate for each procedure type are lower

than the 90% threshold for corrective action for nursing care standards. The rate of compliance with this standard for LC is higher than for all other types of cholecystectomy. Although this compliance rate is lower than threshold, the result was unexpected due to the shorter length of stay and subsequent shorter nursing time with these patients compared to other types of cholecystectomy patients. The result may be due to the elective nature of the procedure, and the higher volume of the patients in this category leading to greater nursing experience, and efficiency. Results are shown in Figure 2..

Figure 2.



The rate of compliance for documentation of preoperative education may be explained by design of the nursing record form in use during the period studied. The record is structured such that charting of preoperative education was written longhand, and was thus more time consuming than utilization of a format designed and organized for maximum efficiency. Most surgical patients, both inpatients and outpatients, are admitted through the Day Surgery unit in which the gathering and recording of large amounts of patient information is performed in a limited amount of time. The record has since undergone two revisions which utilize a "check box" format for preoperative teaching documentation. A Quality Improvement study could be conducted to determine if form revision has improved documentation rate. Additionally, development and implementation of a protocol for preoperative education would ensure documentation based on patients receiving consistent, quality, preoperative teaching.

What is the overall perioperative complication rate for cholecystectomy? The 9.6% overall rate of complications for all types of cholecystectomy procedures at the study site, supports that the complication rate is similar to rates reported in 1992 by Deziel et al. for LC (2% to 11%), and in 1991 by Meyers for OC (6% to 21%).

Complication rates for LC-converted to open cholecystectomy (38.9%), LC with additional procedures (15.4%), and OC with additional procedures (27.3%) were not compared to rates from other studies. The complication rate for LC with additional procedures is within the range for OC, but higher than LC alone. This may be due to the elective nature of procedures in this category, as well as the increased risk for complications from added surgery. The complication rates for LC-converted to open procedures and OC with additional procedures exceed the range reported in the literature for OC. LC converted to OC is indicated for intraoperative complications, thus a high complication rate would be expected for this type of procedure. The high complication rate for OC with additional procedures may be due to the combination of high acuity patients and the increased risk associated with multiple surgical procedures.

The largest portion of the population was LC patients (77.8%), thus frequency counts for data for the other types of cholecystectomy, were too low for cells to be used for chi square testing. To determine statistically significant relationships, findings on complications were collapsed to create a dichotomous variable indicating absence or presence of complications

in the entire population $X(4, N = 295) = 29.05$, $p < .0001$. The findings suggest that LC patients had a lower complication rate than patients undergoing other types of cholecystectomy. Complication rates for each of the procedure types are listed in Table 5..

Table 5.Complication Rate for Cholecystectomy

Procedure	%	No. of Patients
LC	5.3	12
OC	20.0	2
LC - conv.	38.9	7
LC+	15.4	4
OC+	27.3	3
Overall	9.6	28

LC=laparoscopic cholecystectomy

OC=open cholecystectomy

LC-con=laparoscopic cholecystectomy converted to OC

LC+=laparoscopic cholecystectomy with additional procedures

OC+=open cholecystectomy with additional procedures

Rates of specific perioperative complications experienced by the sample are listed in Appendix D. There was no evidence of documentation of vascular or bowel injuries. Reported injury rates in a large series are;

vascular .25%, and bowel .14% (Deziel, et al., 1993).

A graph of complication rate by procedure type can be found in Appendix E.

The perioperative complication rate for OC is within the range reported in the literature for that procedure. Likewise, the complication rate for LC is within reported range.

This information was of importance to the multidisciplinary team involved in the study, and will be entered into the Quality Improvement system at the facility for further investigation. Additionally, it will become part of the Joint Commission indicator monitoring system database.

Summary and Implications

This study addresses interdisciplinary practices related to cholecystectomy at a particular health care setting. The investigative project was based on the concepts of caring and Quality improvement. Particular elements of the study were addressed in this paper. The aim of the study addressed by this paper, was to evaluate and analyze compliance with JCAHO perioperative nursing care standards and quality of care, to identify areas of improvement, and to determine the perioperative complication rate for cholecystectomy.

Results support substantial compliance with

perioperative nursing standards related to patient safety. Opportunities for performance improvement were identified in documentation of preoperative education and self-care needs assessments. Findings also suggest the perioperative cholecystectomy complication rate is within that reported in the literature for studies conducted on LC and OC procedures. The complication rate for LC+ falls in this range as well. The complication rates for LC-converted to OC, and OC+, are higher than rates reported in the literature for both LC and OC.

Future studies should be conducted to evaluate for improvement in compliance rates with JCAHO perioperative nursing standards following implementation of recommendations, such as form revision, and implementation of a protocol for patient preoperative education.

Laparoscopic cholecystectomy has become the treatment of choice for gall bladder disease, consequently, future studies at the facility focused on this method specifically, would provide results reflective of patient care for the majority of cholecystectomy patients. The population was largely female, thus a secondary analysis of the female data could be the focus of a future study.

This study focused on the clinical process related

to perioperative nursing care and the perioperative complication rate for cholecystectomy. The current JCAHO trend for quality improvement activities is continuous quality improvement (CQI), which is both process and outcome oriented. In keeping with this trend, future studies at the facility directed at nursing should measure performance of both processes and outcomes.

Due to the impact on nursing care and patient outcomes, further investigation should be done to determine improvement in perioperative complication rate after surgeon experience with laparoscopic cholecystectomy increases. Analysis of complication type, and point of occurrence, as well as conversion rate from LC to open cholecystectomy would target specific areas for improvement.

Due to the high complication rates for LC-converted to open cholecystectomy and OC+ procedures, other potential areas of investigation are:

1. Nursing's role/responsibility when observing surgeon performance leading to complications,
2. which events are appropriate to communicate through QI channels?,
3. what corrective action can the interdisciplinary QI team do in relation to surgeon performance issues?,
4. Is the complication rate for these procedures within an acceptable range compared to other practice settings?

A study comparing results with investigations conducted at similar regional and nation-wide facilities, would assist in determining if LC and OC perioperative complication rates continue to be within a range acceptable to health care communities.

Conclusion

This study addressed interdisciplinary practices related to cholecystectomy in a particular health care setting. The purpose of the study was to determine the rate of compliance with JCAHO perioperative nursing care standards in an effort to compare performance against accepted standards, to identify areas needing improvement, and to determine the perioperative complication rate for cholecystectomy at the facility.

The results support substantial compliance with JCAHO perioperative nursing care standards related to documentation of surgical sponge and needle counts (96.3%), and intraoperative monitoring of patient position (100.0%). Opportunities for performance improvement were identified for compliance with JCAHO perioperative nursing standards related to self-care needs assessment (35.3%), and preoperative education (77.2%). Compliance rates for standards were measured against the JCAHO threshold of 90% for corrective action for nursing care activities.

The perioperative complication rates for LC-conv. (38.9%), and OC+ (27.3%) reflect the complication-related nature of these procedures. The complication rate for LC+ (15.4) is within the range reported in the literature for OC. The perioperative complication rate for laparoscopic cholecystectomy (5.3%) and open cholecystectomy (20.0%) is within that reported in the literature by studies conducted at other practice settings.

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Appendix A

Copy of data collection instrument

Date 7/21
 Area 10-4
 Survey 10-4
 Assesst Sec 10-4
 Proc
 Time (min)
 Type
 ASA Yark

EFFICIENCY LINE - 22-211


	1	2	3	4	5	6	7	8
1	8/30/91	32-21-04	479	141	4	133	1	3
2	9/6/91	34-73-09	456	141	1	55	1	1
3	9/13/91	01-12-97	456	479	1	65	1	3
4	9/13/91	04-09-23	456	141	1	53	1	3
5	9/13/91	06-89-81	479	456	1	102	2	3 E
6	9/17/91	35-38-84	453	141	1	185	1	2
7	9/20/91	06-01-91	456	479	1	65	1	2
8	9/23/91	05-21-56	456	479	1	80	1	3
9	9/30/91	03-79-87	456	479	1	50	1	2
10	9/30/91	32-76-02	456	479	1	70	1	2
11	12/13/91	06-07-29	456	479	3	125	1	2
12	3/27/92	04-38-00	456	479	3/4	70	1	2
13	5/22/92	06-35-61	456	479	3	123	1	2
14	6/1/92	06-58-04	456	479	3	115	1	2
15	7/22/92	08-25-33	479	456	3	70	1	2
16	10/2/91	06-82-10	453	419	1	97	2	3 E
17	10/7/91	04-28-05	456	479	1	55	1	3
18	10/7/91	06-92-11	456	479	1	55	1	3
19	10/8/91	03-00-19	453	419	1	95	1	1
20	10/8/91	34-31-86	453	419	1	122	1	2
21	10/16/91	00-49-17	456	479	1	125	1	2
22	10/16/91	04-47-08	456	479	1	85	1	1
23	10/21/91	05-79-71	456	479	1	70	1	2
24	10/21/91	06-43-31	456	479	1	75	1	2
25	10/23/91	03-17-30	479	456	4	70	1	3
26	10/23/91	02-73-03	456	479	1	40	2	1
27	10/25/91	35-66-57	456	141	1	75	1	2
28	10/28/91	02-43-59	456	479	1	60	1	3
29	10/29/91	35-63-35	453	423	1	75	1	3
30	12/12/91	06-21-19	469	479	1	105	2	none state

¹tr(s) M/F - xts • compic. transfers self
 Ed needs pre-op pre-op Post-op
 Ed Anesth. Anesth. Sponges/
 Needle Count

	11	12	13	14	15	16	17	18	19
2.5	F		1	2	2	1	1	1	1
9	F		1	2	1	1	1	1	1
11	F		1	2	2	1	1	1	1
14	F		1	2	2	1	1	1	1
17	F		1	2	1	2	1	1	1
1	F		2	2	2	1	1	1	1
2.5	F		1	2	1	1	1	1	1
3	F		1	2	2	1	1	1	1
3/4	F		1	2	2	1	1	1	3
7	F		1	2	1	1	1	1	3
8	F		1	2	1	1	1	1	1
12	M		1	2	1	1	1	1	1
2.5	F		1	2	2	2	1	1	1
2	F		2	2	1	1	1	1	1
4	M		1	2	1	1	1	1	1
2	F		1	2	1	2	1	1	1
6 1/2	F		1	2	1	1	1	1	3
9	F		1	2	2	1	1	1	3
14	F		1	2	1	1	1	1	1
13	F		1	2	1	1	1	1	3
36	F		1	2	2	1	1	1	1
18	F		1	2	2	1	1	1	1
13	F		1	2	2	1	1	1	3
5	F		1	2	1	1	1	1	1
1.5	F		1	2	1	1	1	2	1
1.6	F		1	2	1	1	1	1	1
8	F		1	2	2	1	1	1	3
2	F		1	2	1	1	1	1	1
1.5	F		1	2	1	1	1	1	1
1	F		1	2	1	1	1	1	1

Appendix B.

CODE BOOK FOR CHOLECYSTECTOMY STUDY

Record code assigned to corresponding aspect of each variable on the data collection instrument. For example: for the variable "type of surgery", record the number 1 in the column on the instrument with the heading "type" for elective procedures, 2 for urgent procedures or 3 for emergent procedures.

Definitions for variables are located next to the uppercase word used to label the variable.

PROCEDURE-surgical procedure

1-Laparoscopic cholecystectomy (includes cholangiogram)- surgical procedure in which cholecystectomy is performed via visualization through a laparoscope.

2-Open cholecystectomy-traditional cholecystectomy through an abdominal incision.

3-Laparoscopic cholecystectomy converted to open cholecystectomy-LC which is changed to a conventional open cholecystectomy

4-Laparoscopic cholecystectomy with additional surgical procedures-LC in combination with other surgical procedures such as, bowel resection.

5-Open cholecystectomy with additional surgical

procedures-OC in combination with other surgical procedure, such as bowel resection.

TYPE OF SURGERY-whether elective urgent, or emergent.

1-Elective

2-Urgent

3-Emergent

ASA RATING-see descriptions for each classification category.

1-Class 1 No organic, physiologic, biochemical, or psychiatric disturbance

2-Class 2 Mild -moderate systemic disturbance that may or may not be related to the reason for surgery
Examples: Heart disease that only slightly limits physical activity, essential hypertension, diabetes mellitis, anemia, extremes of age, morbid obesity, chronic bronchitis

3-Class 3 Severe systemic disturbance that may or may not be related to the reason for surgery
Examples: Heart disease that limits activity poorly controlled essential hypertension, diabetes mellitis with vascular complications, COPD that limits activity, angina pectoris, history of prior myocardial infarction

4-Class 4 Severe systemic disturbance that is life-

threatening with or without surgery

Examples: Congestive heart failure, persistent angina pectoris, advanced pulmonary, renal, or hepatic dysfunction (Miller, 1993)

TIME

record in minutes, i.e., 90 minutes=1 hour

COMPLICATIONS- recognized complications of open and laparoscopic cholecystectomy as well as documentation of the complications on the face sheet of the medical record.

1-None

2-Intraoperative bleeding

3-Retained gallstones

4-Post-op ileus

5-post-op cardiac condition/atrial fibrillation

6-post-op jaundice and fever

7-post-op voiding difficulty/urinary retention

8-post-op atelectasis

9-post-op pancreatitis

10-post-op pleural effusion

11-wound infection

12-post-op small bowel obstruction

13-Emergency tracheostomy, difficulty ventilating, unsuccessful intubation, procedure delayed until next day

14-post-op bile leak

15-post-op nausea

16-renal failure

17-post-op UGI bleed

18-bradycardia leading to death

19-post-op acute pulmonary edema

20-post-op ventricular bigeminy

21-post-op hypertension

22-retained stone/planned ECRP for after surgery

23-post-op respiratory insufficiency/mechanical
ventilator required

24-perforated gallbladder/purulence

25-post-op peritoneal bleeding with return to surgery

26-post-op jaundice/pancreatitis

27a-common bile duct obstruction

27b-complications 8 & 19 combined

28-complications 7 & 12 combined

29-complications 8, 9, & 10 combined

30-complications 4 & 8 combined

31-complications 4, 8, & 23 combined

32-complications 8, 16, 17, & 18 combined

TRANSFER TO ANOTHER UNIT-postoperative transfer to a
different nursing unit than planned.

-Yes

2-No

SELF-CARE NEEDS ASSESSMENT -documentation on admission assessment, of patients self-care needs/abilities.

1-Yes

2-No

SPONGE AND NEEDLE COUNT DOCUMENTATION-documentation of sponge and needle count on operating room nursing flow sheet.

1-Yes

2-No

3-NA

PREOPERATIVE EDUCATION DOCUMENTATION -documentation on nursing admission form of preoperative teaching provided.

1-Yes

2-No

INTRAOPERATIVE MONITORING OF PATIENT POSITION DOCUMENTATION-documentation on the operating room nursing record of patient position for surgery including position type, positioning equipment used, padding of pressure points, and placement of safety straps.

1-Yes

2-No

PREOPERATIVE ASSESSMENT PER ANESTHESIOLOGIST-documentation on progress notes page of preoperative patient assessment by an anesthesiologist.

1-Yes

2-No

POSTOPERATIVE ASSESSMENT PER ANESTHESIOLOGIST-

documentation on progress notes page of postoperative
assessment by an anesthesiologist

1-Yes

2-No

Appendix C.

**Copy of permission to review charts for
employer/academic study**

Tuality Healthcare Memo

Date: March 30, 1994
To: Delores Herb, Director of Medical Records
From: Nona Hickenlooper, PM Shift Coordinator *N.H.*
Subject: Review of Medical Records

I am a Registered Nurse employed at Tuality Community Hospital and a Graduate Nursing Student at Oregon Health Sciences University who is participating in data analysis for a hospital sponsored Quality Information Study and for a Master's Research Project.

This memo is a request for permission to review medical records for purposes of the Cholecystectomy Study being conducted through the Quality Improvement Department.

Strict confidentiality of information will be maintained. No patient or physician identifying information will be used.

Thank you for your consideration of this matter.

3/31/94
Delores Herb, A RT
Director Medical Records

Appendix D.Perioperative Complications of Sample

Complications	Rate %	No. of Patients
Retained gallstones	.7	2
Atelectasis	1.7	5
Wound infection	.3	1
Bile leak	.7	2
Ileus	1.0	3
Urinary retention	1.0	3
Nausea	1.4	4
Pulmonary edema + Atelectasis	.3	1
Small bowel obstruction + urinary retention.	.3	1
Plural effusion + Pancreatitis	.3	1
Ileus + Atelectasis	.3	1
Atelectasis + renal failure		
U.G.I. bleeding + death.	.3	1

