Thematic analysis of patient derived quality measures following upper limb surgery

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Thesis

THEMATIC ANALYSIS OF PATIENT DERIVED QUALITY MEASURES
FOLLOWING UPPER LIMB SURGERY

by

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THEMATIC ANALYSIS OF PATIENT DERIVED QUALITY MEASURES FOLLOWING UPPER LIMB SURGERY

NICOLE SHEIKHOLESAMI

ABSTRACT

Objective: This study investigated how upper limb post-operative patients defined quality care. We specifically assessed the following three aims: (1) determining patient expectations following upper limb surgery, (2) identifying patient recognized barriers to receiving quality care, and (3) analyzing patient identified areas of improvement in patient education.

Method: In total, 52 patients, aged 19 – 89 years (mean age: 48 years) who received upper limb surgery were surveyed with an open-ended questionnaire during their six to eight week post-operative visit at Stanford Medicine Outpatient Center in Redwood City or Stanford Orthopaedic Surgery Clinic in Los Gatos. Responses were electronically transcribed to REDcap, Research Electronic Data Capture System, for analysis of responses to demographic questions. Open-ended questions were evaluated by thematic analysis until data saturation was reached.

Results: Thematic analysis of open-ended responses revealed three main themes: (1) Pain, (2) Function; and (3) Patient Unpreparedness. Both pain and function involved pre- and post-operative factors. Of our three identified themes, elimination of pain and regaining function were the two main health-outcomes that upper limb patients identified
as successful treatments of their condition. Patient unpreparedness was recognized as a main barrier in patients receiving quality care and an important area to improve patient education about their problem and treatment.

**Conclusion:** By understanding the desired health outcomes and limitations in achieving those outcomes for post-operative upper limb patients, we can improve how medical care is practiced. Our results highlighted that both process and outcome domains of care are important elements in patients’ definition of quality care when seeking medical treatment for their upper limb problems. Specifically, patients identified that elimination of pain and regaining function were important health outcomes during their care. In order to achieve those desired health-outcomes, we recognized that improvements need to be made with regard to patient education about their health condition and treatment process, in order to foster better physician-patient communication. Overall, our findings support the need for continued focus on patient-centered care to ensure the delivery of quality healthcare to all patients.
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<thead>
<tr>
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<tr>
<td>ACA</td>
<td>Affordable Care Act</td>
</tr>
<tr>
<td>AHRQ</td>
<td>Agency for Healthcare Research and Quality</td>
</tr>
<tr>
<td>CMS</td>
<td>Center for Medicare and Medicaid Services</td>
</tr>
<tr>
<td>ED</td>
<td>Emergency Department</td>
</tr>
<tr>
<td>EP</td>
<td>Eligible Professional</td>
</tr>
<tr>
<td>HHS</td>
<td>Department of Health and Human Services</td>
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<tr>
<td>IOM</td>
<td>Institute of Medicine</td>
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<tr>
<td>IRB</td>
<td>Institutional Review Board</td>
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<td>NQS</td>
<td>National Quality Strategy</td>
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<tr>
<td>PFS</td>
<td>Physician Fee Schedule</td>
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<td>PQRS</td>
<td>Physician Quality Reporting System</td>
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<tr>
<td>PROM</td>
<td>Patient Reported Outcome Measure</td>
</tr>
<tr>
<td>REDCAP</td>
<td>Research Electronic Capture System</td>
</tr>
<tr>
<td>SIP</td>
<td>Sickness Impact Profile</td>
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<tr>
<td>SSI</td>
<td>Surgical Site Infection</td>
</tr>
<tr>
<td>TRHCA</td>
<td>Tax Relief and Health Care Act</td>
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<tr>
<td>VM</td>
<td>Value Based Payment Modifier</td>
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INTRODUCTION

Providing high quality medical care, at a low cost, continues to be a major goal of the U.S. healthcare system1. Unfortunately, developing a unified definition of high quality care is challenging as it involves balancing multiple perspectives on what factors constitute high quality2. A person’s definition of quality may differ based upon his or her role in the health care system3,4. For example, a physician may view high quality care as successfully completing an operation that improves a patient’s range of motion; whereas the patient in this example may believe high quality care is achieved only if they are completely pain free and have no physical limitations. While both the physician and patient have a general shared goal of high quality care, upon further analysis, it is clear that they may have very different definitions of quality. Over the past two decades, the physician-patient relationship has drastically shifted from a paternalistic model to a patient-centered healthcare system, where the patient defines quality, based on his or her expectations, values, and goals5,6. The Institute of Medicine (IOM) has facilitated this transition in healthcare focus by implementing a six dimension guide to ensure patient-centered care7.

Defining and Measuring Quality of Care: Rutstein

Dr. David Rutstein, laid some of the early ground work for studies in measuring the quality of medical care. He defined quality as the result that care has on the individual or population and that medical care is the application of current medical knowledge to address patient needs8. In particularly, he helped shift the focus of medical care from
concerns about efficiency towards concerns about quality\textsuperscript{8}. He outlined a method to measure the quality of medical care and argued that while efficiency and quality are both essential to quality care, they each have very unique functions. Efficiency is analogous to how well smaller, different components of a larger entity are able to work together, whereas quality is the outcome that results from all the parts functioning together\textsuperscript{8}. In effect, efficiency is concerned with the process of care delivery whereas quality is focused on the health outcomes\textsuperscript{8}. In focusing medical practices to align more strongly with quality, he proposed a method to measure the quality of medical care by analyzing and determining quantitative negative indices of healthcare delivery. Examples of these indices include avoidable diseases, disabilities, and death, and can be understood as when harm outweighs benefits in the delivery of care\textsuperscript{9}. By outlining and tracking these parameters, the model highlights the healthcare system’s shortcomings, such that they may be resolved. The success of this model was demonstrated in the 1930s by the New York Academy of Medicine when it started tracking and analyzing maternal and fetal mortality rates\textsuperscript{8}. Obstetric physicians’ evaluation of these high death rates, identified various medical practices which were contributing to the unnecessary mortality of mothers and their babies\textsuperscript{10,11}. By identifying and remedying these practices, these physicians were able to improve patient outcomes\textsuperscript{10}. They embodied Rutstein’s definition of quality care by implementing their expanded understanding of preventative care measures, obstetric complications, and improper utilization of medical equipment in fetal delivery.
Defining Quality Care Standards: Donabedian’s Model

Avedis Donabedian was a key figure in the development of studies to assess quality in healthcare. He defined quality as “the extent to which the care provided is expected to achieve the most favorable balance of risks and benefits” and extended his explanation to include that “judgements of quality are often made not about medical care in itself, but indirectly about the person who provided the care, and about the settings or systems within which care is provided” \(^4\). Through this definition, he attempted to integrate various complex perspectives into a single model and provide insight as to the importance of considering not only how a practitioner accounts for weighing the risks and benefits of treatment options but also the way in which care is provided to a patient\(^2,4\).

Donabedian devised two important models that evaluated the complex relationship between the different components that go into medical care delivery. The first of these models addressed the existence of multiple social spheres that each describe the role providers, patients, and the community contribute in the assessment of quality care. These levels consist of (1) care by provider, (2) care implemented by patient, and (3) care received by community\(^2\). Figure 1 shows the subdivision of these levels and highlights the central positioning of care delivered by a provider. According to Donabedian, medical providers are the foundation upon which quality is derived. Therefore assessing quality care begins with understanding the performance responsibilities of the provider.
Figure 1. Levels of Quality Assessment: Depicts the three levels from which quality of care can be assessed. Care by Provider acts as the foundational element in defining quality care by specifically looking at the technical and interpersonal contributions of medical care providers. Both the Care Implemented by Patient and Care Received by Community function as supporting elements which facilitate in the ability to achieve high quality care. (Adapted from Donabedian, 1988)²

In Figure 1, the inner region is broken down into two subcategories involving both technical and interpersonal elements. The technical refers to the physical execution of care and relies on the knowledge base of the physician². As Donabedian points out, technical practices are “judged in comparison with the best in practice” whom have gained their respect based on their efforts to improve healthcare practices². On the other hand, the interpersonal variable describes the communication and transmission of information and diagnostic plans from physician to patient². Donabedian notes that the
interpersonal element functions as a means of administering the technical care to patients.2

The following two layers evaluate how the patient and community, respectively, impact the quality of care provided. As we cross between each of the layers we add the parameter of shared responsibility between individuals in the previous layer and those in the subsequent layer. Therefore, it is clear that while physicians form the foundational base of delivering quality care, it is also the responsibility of patients, patients’ families, and the community to help facilitate the process of achieving high quality care.2

In order to assess the interrelationship between provider, patient, and the community, Donabedian outlined a three pronged paradigm in which we can analyze quality measures at each of these levels based on structure, process, and outcome.2,12. We can define quality measures as “evidence-based tools that allow us to evaluate the quality of care.”13–16. Figure 2 demonstrates the interrelationship between each of these three domains and how they are each necessary in order to achieve quality care. Hammermeister et al. highlights that in order to properly assess and improve quality care, we must employ all three domains of Donabedian’s model by taking into account their interdependence.17 Due to the interconnected nature of each of these variables, understanding their individual roles can help predict the impact they may have on each other.
Figure 2. Donabedian’s Quality Triad: This Venn diagram depicts the three domains of Donabedian’s model in defining quality care. Overlapping regions correspond to the co-influence of each contributing section. The center represents a culmination of all three domains and results in the achievement of quality care.

Quality Measure: Structure

The first domain of Donabedian’s model is defined by the structural components of the healthcare system which facilitate the transmission of care. This consists of the material resources and setting in which care is delivered such as medical facilities, personnel, and equipment as well as the organization and accessibility of these elements. The structural features of the healthcare model have a direct impact on the processes and outcomes parameters of Donabedian’s definition. Specifically, structural variables pertaining to staff experience and procedural volume load have been used to
assess surgical quality outcomes. Studies have shown that high procedure volume hospitals have a lower rate of mortality, decreased risk of complications, and better long term survival rate compared to low procedure volume institutions. One advantage of utilizing structure variables in quality assessment is that they are inexpensive to analyze and easily accessible from administrative claims. However, an important factor to consider is that structural factors can often be outside of a physician’s control and therefore can pose limitations when it comes to facilitating quality care to patients.

**Quality Measure: Process**

The next domain in Donabedian’s model involves the process of care delivery. It specifically evaluates the steps involved in the distribution of care from a health provider to a patient. Process measures consist of items such as administering influenza vaccine, providing patients with diabetes regular foot care, and assessing and treating pain during medical encounter. It also encompasses tracking objective measurements taken by calibrated instruments to assess grip strength, range of motion, and others. The advantage to utilizing process measurements in assessing quality care is that they are each actionable by physicians to improve patient care and their health outcomes. Unfortunately, a specific process does not guarantee a specific health outcome.

**Quality Measure: Outcome**

The third domain of Donabedian’s model, involves the health outcomes of a patient as a result of care provided, and is thus based upon the direct or indirect impact of structure and process on the outcome. Tracking of the long term health outcomes of
patients in relation to diagnostic and treatment errors in an effort to improve health care practices was occurring before Donabedian’s formal classification system by Boston surgeon Dr. Ernest Codman, in the early 1900s. Following this early example, outcome measures commonly used today consist of mortality rate, complication rate, hospital readmission rate, length of stay, functional health status, patient satisfaction, as well as other measures assessing a patient’s quality of life. Some of these outcome measures have the advantage of being easily quantifiable, but more importantly, outcome measures are able to measure what is really important to patients. The degree to which a successful outcome has been achieved should ultimately come from the patient perspective. Patient reported outcome measures (PROMs) are typically instruments completed by the patient and have been increasingly used to evaluate the quality of treatment. As important as PROMs have become, there are certain limitations on their practicality and usability during care. For example, post-operative outcomes are assessed after a substantial amount of time has passed since the initial point of care, and there may be potential shifts in a patient’s outcome status over the duration of their recovery process.

According to Campbell et al., an important distinction between outcomes and the other two domains, is that outcomes are not based on a linearly, predictive mechanism. For example, even if the exact same structure and process that is applied to one patient is carried out for another, the yielded outcomes could be extremely different. This introduces the debate about which of these domains are better suited to function as measures of high quality care, and highlights the need to better understand patient
preferences and their individual definitions of high quality care.

*Process vs Outcome Based Assessment of Quality*

Both process based and outcome based quality measures are important in our assessment of quality care. In general, process domains can be measured reliably, validly, and typically without much bias. Assessment of these process variables are typically easy since there are no confounding factors -- as long as appropriate process measures are being applied to a patient’s treatment plan. While process measures are easy to quantify and can be quickly modified by a physician’s intervention, they are only valuable indicators of quality if they are supported by evidence and are shown to improve patient outcomes. Within orthopaedics, process measures are used in quality assessment; however, their accuracy in correlating improvement in patient-defined outcomes and patient satisfaction has not been well-validated. For example, if we utilized the objective metrics of a process variable such as giving a patient pre-operative antibiotics, we would conclude that quality care was delivered. However, this may not indicate that the patient did not have an infection post-operatively. In this example, using a process measure would indicate high quality care was implemented, whereas using an outcome measure may indicate that inadequate care was implemented if the patient acquired an infection.

In contrast, outcome domains are focused on the primary health goals of the patient choosing to undergo treatment. Some PROMs commonly measured include a patient’s level of pain, quality of life, and physical function. Research shows that
systematic utilization of PROMs in clinical practice, improves shared-decision making between physicians and patients as well as leads to greater patient satisfaction\textsuperscript{31–34}. The increased attention to patient-centered care makes utilizing outcome measures more applicable since we are actually gaining direct understanding of patients’ definitions of high quality outcomes.

\textbf{What Quality Means Today}

How we define quality is constantly changing alongside shifts in our healthcare system’s focus to a patient-centered model. The definition set forth by the IOM is the most widely accepted throughout literature and states that quality is “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”\textsuperscript{35}.

Two key points are highlighted by this definition: “desired health outcomes” and “current professional knowledge”. According to Kamal et al., within hand surgery these factors are heavily dependent on constantly shifting factors\textsuperscript{15}. The desired health outcome is contingent on variables such as how the outcome is defined (patient vs physician perspective) as well as the type of surgical procedure performed\textsuperscript{15}. With regard to “current professional knowledge”, a physician’s technical training will adapt based upon the advancements in procedural protocols, thus shifting the expected outcomes as defined by surgeons\textsuperscript{15}.

Overall, the focus of quality assessment is moving towards a patient-centered model, in which the patient perspective is playing a large role in driving the way
healthcare practices are conducted and how we evaluate health outcomes. Since the utilization of PROMs bolsters the physician-patient relationship and ultimately improves overall patient satisfaction with their care, it is essential that we understand what exactly patients are looking for with regard to their upper limb surgical care\textsuperscript{31–34}.

**Current Programs Involved in Ensuring Quality Medical Care**

In the past decade, the Department of Health and Human Services (HHS) has made large gains in passing legislative items which aim to increase focus on how quality care is defined today as well as taking steps to determine effective means of measuring quality through quality measures\textsuperscript{36,37}.

**Centers for Medicare and Medicaid Services**

The Physician Quality Reporting (PQRS) is one of first national quality reporting systems that requires physicians to report on established PQRS quality measures to prevent reimbursement deductions for services provided to Medicare Part B beneficiaries\textsuperscript{37–39}. The objective of PQRS is to evaluate healthcare processes in correlation with health outcomes as a means to assess the quality of care provided and to ensure that patients are receiving the proper care in a timely manner\textsuperscript{37,39,40}. Based on the Center for Medicare and Medicaid Services (CMS) web-based tool for the 2016 PQRS Individual Measures Specifications for Claims and Registry Reporting, there are currently 281 quality measures being used\textsuperscript{41,42}. 

11
In 2006, the PQRS was introduced as part of legislation in the Tax Relief and Health Care Act (TRHCA) and it established a 1.5% reimbursement incentive for physicians who successfully submitted data on quality measures to Medicare for all applicable treatments. With the passages of the Affordable Care Act (ACA) in 2010, PQRS underwent many changes, most notably the shift to a negative payment system for Physician Fee Schedule (PFS) covered services starting in 2015. Eligible professionals (EPs) who did not satisfactorily report quality measures to the CMS were subject to a reimbursement penalty of up to 1.5% of PFS covered services in 2015. Starting in 2016 and in subsequent years, the negative payment adjustment for PQRS will increase and be capped at 2.0%.

As part of the ACA, CMS also requires implementation of value based payment modifiers (VMs) to Medicare PFS payments. VMs are separate, additional adjustments to Medicare PFS to physicians or groups of physicians, based on the quality of care delivered to patients in comparison to the cost of providing that care. The quality component is judged based upon the quality measures reported by physicians to CMS. While cost performance of physicians will be assessed by CMS using five total per capita cost measures along with the Medicare spending per beneficiary measure. Both quality and cost scores will be equally weighted to determine a composite VM score. Figure 3 details the factors that make up the quality and cost component in determining a physician’s VM score.
Figure 3. VM Scoring Chart: Calculation for VM composite score are based on quality and cost components. Subdomains within both the quality and cost categories are equally weighted. Any domains that do not have measures which can be assessed are omitted from the VM composite score and the remaining domains are weighted equally. (Figure adapted from American College of Surgeons at https://www.facs.org/advocacy/regulatory/vbm)46

The VM system is a budget neutral model which gives providers who participate in PQRS and meet certain standards the opportunity to receive a positive reimbursement adjustment, while providers who are noncompliant with PQRS will incur a negative reimbursement adjustment47,48. The system utilizes both a quality and cost tier system, which are each broken down into low, medium, and high, yielding nine different categorization for EPs. Table 1 shows the nine different groups that EPs could be classified based on the quality of care achieved relative to the cost of care delivery and their corresponding reimbursement rates47.
Table 1. Cost and Quality Relationship with Respect to VM Reimbursements: Each provider is grouped into low, average, or high performance relative to the mean for both cost and quality scores. The ratio of cost and quality performance yields nine different groups which distinguish which providers will receive a bonus, penalty, or neither. (Table adapted from Center for Medicare and Medicaid Services at https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeedbackProgram/Downloads/2015-Value-Modifier-Results.pdf)\textsuperscript{47}

<table>
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<tr>
<th>Cost/Quality</th>
<th>Low Quality</th>
<th>Average Quality</th>
<th>High Quality</th>
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<tr>
<td>Low Cost</td>
<td>Neutral</td>
<td>Incentive</td>
<td>Incentive</td>
</tr>
<tr>
<td>Average Cost</td>
<td>Penalty</td>
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</tr>
<tr>
<td>High Cost</td>
<td>Penalty</td>
<td>Penalty</td>
<td>Neutral</td>
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Negative payment adjustments for VM started at 1% in 2015, and will increase to 2% and 4% for 2016 and 2017, respectively\textsuperscript{38}. Positive payment adjustments are variable and based on the number of physicians receiving negative adjustments\textsuperscript{47}. The VM program will gradually be phased in between 2015 and 2018, such that by 2018 all physicians as well as physician assistants, nurse practitioners, clinical nurse specialists and certified registered nurse anesthetists who are solo practitioners or in groups of 2 or more EPs will be included in the VM program\textsuperscript{49,50}.

Both PQRS and VM reimbursement rates are based on performance from two years prior to the current calendar year\textsuperscript{44}. Table 2 outlines the PQRS and VM penalty adjustments beginning in 2015 and going through 2020.
Table 2. PQRS and VM Penalty Adjustments: These are the maximum penalties imposed upon practices and providers who are noncompliant with PQRS benchmarks. (Table taken from American College of Surgeons at http://bulletin.facs.org/2015/04/surgeons-can-avoid-pqrs-and-value-based-modifier-payment-penalties/) 38

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<tr>
<td>Year Penalty is Applied</td>
<td>2015</td>
<td>2016</td>
<td>2017</td>
<td>2018</td>
<td>2019</td>
<td>2020</td>
</tr>
<tr>
<td>CMS Program</td>
<td>PQRs</td>
<td>-1.5%</td>
<td>-2%</td>
<td>-2%</td>
<td>-2%</td>
<td>-2%</td>
</tr>
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<td></td>
<td>Value-Based Payment Modifier*</td>
<td>-1%</td>
<td>-2%</td>
<td>Up to -4%</td>
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<td>Total Potential Penalty</td>
<td>-2.5%</td>
<td>-4%</td>
<td>-6%</td>
<td>TBD</td>
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*VM adjustments are contingent upon participation in PQRS. Non-participation in PQRS can also result in VM penalty.

The overall goal of these legislative steps is to promote physicians to have a greater awareness and action in propagating quality healthcare standards within their practice while also minimizing cost per patient37.

Agency for Healthcare Research and Quality/National Quality Strategy

Working in conjunction with CMS, the Agency for Healthcare Research and Quality (AHRQ) is a subdivision of the HHS and works to make health care more accessible, affordable, safer, and of higher quality through various legislative actions51. One such effort is the National Quality Strategy (NQS) which was published in 2011 by AHRQ. The NQS outlines three aims, six priorities, and nine levers which are designed to assess and guide efforts in improving the quality of health care52. Figure 4 details each of the three aims, six priorities, and nine levers set forth by the NQS. The aims function as a guide at the local, state and national level to guide quality assessment and
improvement initiatives to improve overall health and the quality in the healthcare system\textsuperscript{53}. These aims specifically focus on (1) Better care – such that the system is more patient-centered, accessible, and reliable (2) Healthy People – focusing on advancing efforts which aid the entire US population in health improvement (3) Affordable care – making quality care within financial reach for the US population\textsuperscript{53}. The priorities are designed to further the goals set forth by the three aims and the nine levers are meant for stakeholders to use as means to align with the NQS’s efforts to improve quality care\textsuperscript{53}. 
Figure 4. National Quality Strategy Aims, Priorities, and Levers: The three aims are found in the center of the circle and encompass the overarching quality objective of NQS. The six priorities are located in the inner blue region and are more focused means by which the three aims may be carried out. In the outer green circle are the nine levers. They outline the methods in which the priorities may be carried out by various participants invested in healthcare quality improvement, which are found in the outer most circle of this diagram. (Figure taken from National Quality Strategy ToolKit at http://www.ahrq.gov/workingforquality/nqs/nqstoolkit.htm)
**High Cost Does Not Mean High Quality**

With continuously rising healthcare spending, the question becomes whether or not the cost of various treatment options, translates into quality care that matches the new price tag\(^8\). Essentially, we are asking: what is the value of the care being provided? In this case, value is defined as the benefits from treatment or the quality of care achieved per dollar spent\(^{23,55}\). Figure 5 depicts the relationship between value, cost, and quality of care.

In Figure 5, the quality variable encompasses Donabedian’s three domains: structure, process, and outcomes\(^{2,55}\).

**Figure 5. Relating Value, Cost, and Quality:** Value is the ratio of quality of treatment relative to cost of treatment. Quality is defined by the health outcomes obtained and the patient’s experience which encompasses the structure and process domains of Donabedian’s model. Cost is defined by direct costs (i.e. surgical procedure) and indirect costs (i.e. post-operative surgical site infection) (Figure taken from PM 360 at https://www.pm360online.com/how-do-you-define-value-in-healthcare/)\(^{56}\).

Based on Figure 5 the value of care depends on a maximization of health benefits and minimization of health expenditures\(^{56,57}\). Therefore, in order to achieve high-value care we need to improve the healthcare system’s structures, processes, and outcomes while simultaneously reducing costs\(^{57}\). Donabedian et al. demonstrated that as the resource expenditure for an average physician increases, the rate of change for the net value of total expected health improvement decreases after a certain point\(^{58}\). In other words, value
correlates with total cost until a certain point after which there is actually a decrease in the value of care for the rising expenditure. Figure 6 demonstrates this relationship between resource expenditure and net value of total expected health improvement.
Figure 6. Increased Resource Expenditure Effect on Value of Expected Health Improvement: A) The first graph depicts the relationship between the value of health improvement with respect to changes in resource expenditure. As expenditures increase the value of the expected health improvement decreases. B) This graph shows how with greater resource expenditure, the expected health improvement increases until it reaches a plateau. Any additional increase in resource expenditure would not yield any further increase in expected health improvement. C) The final graph is a summation of the first two graphs into a single graph. It shows that rising resource expenditure correlates to increased value of health improvement until a maximal point. After that point ($R_{opt}$) there is a decrease in value of health improvement. $R_{opt}$ represents the resource expenditure at which optimal value is perceived. $R_{IU}$ represents ideal unconstrained expenditures. From the final graph it is seen that $R_{IU}$ has a lower net value of total expected health improvement despite having a higher resource expenditure, compared to $R_{opt}$ (Taken from Donabedian 1982) \(^{58}\)
**Quality and Patient Centeredness**

Achieving a workable definition of quality care requires understanding the perspective of all stakeholders in the healthcare system. Identifying patient definitions of quality care would allow for health systems, physicians, and payers to focus efforts towards understanding and maximizing the quality of care provided. While it is clear that quality measures are imperative in healthcare improvement, how do we effectively address the unique goals of patients? Both cost and outcome based parameters are unable to fully answer this question. In order to address this point, we must shift our focus to patient-centered care. The concept of patient-centered care became a healthcare focus in 2001 after the IOM highlighted it as one of its six specific aims for improvement to the United States healthcare system\(^7\). According to the IOM, patient-centered care encompasses qualities of compassion, empathy, and responsiveness to the needs, values, and expressed preferences of the individual patient when making clinical decisions\(^7\). This contrasts Donabedian’s physician centered model (Figure 1), and highlights the change in healthcare practice to greater emphasis on the patient’s desires. As part of this definition, the IOM highlighted six dimensions of patient-centered care which were originally described by Gerties et al. and are outlined in Table 3 \(^7,59\).
Table 3. Six Dimension of Patient-Centered Care: Outlines the six factors to be considered and practiced by providers in order to deliver patient-centered care.

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Respect for patients’ values, preferences, and expressed needs</td>
</tr>
<tr>
<td>2</td>
<td>Coordination and integration of care</td>
</tr>
<tr>
<td>3</td>
<td>Information, communication, and education</td>
</tr>
<tr>
<td>4</td>
<td>Physical comfort</td>
</tr>
<tr>
<td>5</td>
<td>Emotional support</td>
</tr>
<tr>
<td>6</td>
<td>Involvement of family and friends</td>
</tr>
</tbody>
</table>

The objective of integrating these six dimensions of patient-centered care into medical practice is to facilitate a partnership between patients and medical professionals in healthcare decision making processes\(^\text{60}\). Specifically, the goal is to form a relationship that transcends social, economic, and demographic differences\(^\text{61,62}\). In achieving this, physicians are able to develop a stronger understanding and respect for a patient’s values and expectations, thus allowing them to provide high quality care\(^\text{60}\).

**Why is Patient-Centered Care Important?**

Patient-centered care continues to be important in our healthcare system because it provides improved care and overall well-being for patients, is blind to disparity differences between patients, and has better economical value\(^\text{60}\). Research has shown that utilizing a patient-centered care model leads to better health outcomes, higher rates of drug therapy adherence, and improved quality of life for patients\(^\text{63–65}\). The mechanism by which physician-patient communication facilitates these improvements in health outcomes is due to seven different pathways\(^\text{66}\). These pathways include: access to needed care, increased patient knowledge and shared understanding, enhancing therapeutic
alliances between physicians, patient, and family members, enhancing emotional self-management, activating social support and advocacy resources, increasing the quality of medical decisions, and enabling patient self-efficacy and empowerment.\textsuperscript{66}

With regard to a patient’s well-being, patient-centered care acts by helping to reduce stress, anxiety, and depression while also facilitating the formation of a trusting relationship between physicians and their patients.\textsuperscript{60} In turn this allows patients to gain a sense of empowerment, enabling them to advocate for themselves and be part of the shared decision making process.\textsuperscript{67}

Racial and socioeconomic disparities in care and health outcomes are very crucial to understand and consider. Individuals who face these social, economic, and demographic barriers are most likely to also have difficulties with understanding all the medical terminology, procedures, and processes involved in their care.\textsuperscript{60} As a result of these challenges, those individuals are less likely to seek and adhere to care and consequently their quality of life will suffer.\textsuperscript{62} Patient-centered care helps to eliminate these gaps in understanding between physicians and patients and mitigates the disadvantages in receiving care for racial, economical, and social minorities.\textsuperscript{68}

Patient-centered care also plays a role in improving the value of care, by raising quality provided but also decreasing overall costs of care.\textsuperscript{60} For example, primary care physicians who practiced patient-centered care had a lower rate of malpractice suits against them in comparison to primary care physicians who did not practice patient-centered care.\textsuperscript{69} Therefore, these physicians implementing patient-centered care were reducing the indirect cost of care. Furthermore, the formation of a trusting relationship
between a physician and patient can be crucial in ensuring a patient’s safety. For example, a patient may visit their primary care physician and be prescribed amoxicillin but unless their physician asks them what other medications they are currently taking and the patient feels comfortable sharing, they may fail to mention their other medications include Viagra. The combination of these two drugs could lead to a dangerous elevation in a patient’s blood pressure and result in severe health complications\textsuperscript{70}.

As the healthcare system continues shifting towards patient-centered care, it is important to understand patient expectations and values. Very little research has gone into identifying what those patient perceived values and expectations are with regard to upper limb surgery. By understanding what upper limb patients value in their surgical care, we are able to provide high quality patient-centered care. Therefore we studied patients with upper limb disorders to ascertain patient definitions of high quality care.
Specific Aims and Objectives

We analyzed how patients defined high quality care, through questions that evaluated pre-operative, operative, and post-operative domains of care.

The specific aims of this study are:

1. To determine patient expectations after hand surgery
   Using qualitative measures we will identify the key health outcomes patients believe should be achieved in order to successfully treat their problem.

2. To identify patient recognized barriers to obtaining high quality care
   Using qualitative measures we will identify what patients perceive as obstacles while seeking quality care. This will also identify where healthcare providers need to implement changes in order to eliminate those barriers.

3. To analyze patient identified areas for improvements in patient education
   Using qualitative measures we will evaluate the patient’s perspective on what elements of surgical care they feel require greater explanation by their provider.

Through this study, we will identify how patients with upper limb disorders define quality care as they specifically relate to patients’ standards and needs. By establishing these umbrella categories, we are able to identify the particular factors that are most important to this cohort of patients. Therefore medical professionals can use this information to ensure that they are meeting what patients define as high quality medical care in upper limb surgery.
METHODS

Study Design and Participants

This research study was conducted at two outpatient clinic locations in California: Stanford Medicine Outpatient Center in Redwood City and Stanford Orthopaedic Surgery Clinic in Los Gatos. Survey participants were post-operative Orthopaedic patients who received hand or upper extremity surgery. Surveys were collected by a research fellow during a patient’s six to eight week post-operative clinic visit via a paper survey format. Participants were verbally informed that this study was voluntary and anonymous in addition to being provided with an Institutional Review Board (IRB) consent form stating our study’s purpose in greater detail. If consent was obtained, the research fellow left the room and allowed the participant to complete the open ended survey in the privacy of an examination room. Completed surveys were then electronically transcribed and managed using REDcap electronic data capture tools hosted at the Stanford Center for Clinical Informatics. REDcap is a web-based application that allows for the electronic accumulation of data for research purposes.

We estimated we would need 50 post-operative patients based on prior similar studies; however, the study was complete once saturation was achieved. We included adult participants with English fluency and literacy who were able to provide informed consent. Our exclusion criteria consisted of minors (<18 years old) and non-English speaking or illiterate patients.
Survey Questions

The survey was administered during a patient’s post-operative follow up clinic visit. A brief introduction of the surveyor and the research study was provided; in addition, patients were asked for their consent to participate in this study as well as advised that their responses would remain anonymous and confidential. An IRB consent form was included as the first page in the survey forms to provide participants with a more detailed background about this study. No personal health information was collected as part of this study and participants who continued past the first page to the survey questions were indicating their consent to voluntarily participate in this study. The introduction prompt used in data collection was as follows:

Hi Mr. or Ms.___________my name is Nicole Sheikholeslami and I am a research assistant working with Dr. Kamal on a study to determine how patients define high quality care. I have a short survey that will take a few minutes of your time and is optional and confidential. Would you be willing to participate today?

Patients were left in the privacy of an exam room to complete the survey and at the end of their appointment, a research fellow would collected the completed form. The survey tool consisted of a combination of demographic information as well as a series of open-ended questions about the patient’s surgical expectations and their actual experience. An outline of the survey questions given to participants to answer is provided below:
<table>
<thead>
<tr>
<th>What is your age?</th>
<th>What surgery did you have?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carpal tunnel release</td>
</tr>
<tr>
<td></td>
<td>Cubital tunnel release</td>
</tr>
<tr>
<td></td>
<td>Hand/Finger fracture</td>
</tr>
<tr>
<td></td>
<td>Wrist fracture</td>
</tr>
<tr>
<td></td>
<td>Tendinopathy (Trigger Finger, deQuervain’s release)</td>
</tr>
<tr>
<td></td>
<td>Thumb Arthritis Surgery</td>
</tr>
<tr>
<td></td>
<td>Tendon repair</td>
</tr>
<tr>
<td></td>
<td>Lump Removal (Ganglion Cyst)</td>
</tr>
<tr>
<td></td>
<td>Other____________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is your gender?</th>
<th>What is your yearly household income?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Less than $15,000</td>
</tr>
<tr>
<td></td>
<td>From $15,000 to $29,999</td>
</tr>
<tr>
<td>Female</td>
<td>From $30,000 to $49,999</td>
</tr>
<tr>
<td></td>
<td>From $50,000 to $99,999</td>
</tr>
<tr>
<td></td>
<td>More than $100,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is your race/ethnicity? Please check all that apply</th>
<th>What is your current employment status?</th>
</tr>
</thead>
<tbody>
<tr>
<td>White/ Non-Hispanic</td>
<td>Full-time employed</td>
</tr>
<tr>
<td>Black or African-American</td>
<td>Part-time employed</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>Retired</td>
</tr>
<tr>
<td>Asian</td>
<td>Don’t work outside the home</td>
</tr>
<tr>
<td>Hispanic</td>
<td>Disabled</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific Islander</td>
<td>Unemployed</td>
</tr>
<tr>
<td>Other</td>
<td>Student</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is the highest level of education you have achieved?</th>
<th>What type of insurance do you have? Please check all that apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary school</td>
<td>Medicaid</td>
</tr>
<tr>
<td>High school graduate</td>
<td>Medicare</td>
</tr>
<tr>
<td>2 year college degree</td>
<td>Health insurance from my employer or my spouse’s/parent’s employer</td>
</tr>
<tr>
<td>4 year college degree</td>
<td>Health insurance that I purchase personally out of pocket</td>
</tr>
<tr>
<td>Post-college graduate degree</td>
<td>Supplemental insurance that I and/or my spouse pays</td>
</tr>
<tr>
<td>(Masters, PhD, MD, JD, etc)</td>
<td>No health insurance</td>
</tr>
<tr>
<td></td>
<td>Other: Please specify below</td>
</tr>
</tbody>
</table>
### How many days off of work/school did you have to take due to your surgery?
*(Skip this question if employment status is: Retired, Don’t work outside the home, Disabled, or Unemployed)*

- [ ] 0 days
- [ ] 1-3 days
- [ ] 4-7 days
- [ ] 8-14 days
- [ ] 15-21 days
- [ ] 22-42 days
- [ ] Greater than 6 weeks

### Who helped take care of you after surgery *(primary caretaker)*?
- [ ] My spouse/significant other
- [ ] My mother/father
- [ ] My sibling
- [ ] My child
- [ ] A friend
- [ ] No one

### How many days off of work did your caretaker have to take due to your injury and/or surgery? *(Skip if no primary caretaker assistance)*

- [ ] 0 days
- [ ] 1-3 days
- [ ] 4-7 days
- [ ] 8-14 days
- [ ] 15-21 days
- [ ] 22-42 days
- [ ] Greater than 6 weeks

### Did you get paid while you were not working due to your injury/surgery?
- [ ] Yes, employer *(paid time off)*
- [ ] Yes, temporary disability
- [ ] Yes, work insurance
- [ ] No, I lost money
- [ ] No, I do not work

### How much income do you estimate was lost from not working due to this injury and surgery in dollars *(General Estimate)*?

______________________________

### Three challenges I faced during surgery:

### Three challenges I faced during recovery:

### Three things I wish I knew that no one told me:

### Complete this statement: Successful treatment of my problem means:

### How do we better educate patients about their problem?
How do we better educate patients about what to expect from surgery/recovery after surgery?

If a friend or family member is having the same surgery as me, I will tell them to be prepared for:

The person who helped take care of me at home after surgery wished they were prepared for: (Skip if no primary caretaker assistance)

Data Processing

Survey responses were captured via a paper survey format and then transferred into a REDcap database for analysis. The open ended responses were subsequently analyzed using thematic analysis techniques by coding responses using a manual, open coding method.

Thematic Analysis

In healthcare, qualitative research is a broad methodology that aims to explore the complex relationship between patients and physicians. Some characteristics of qualitative methodologies, includes focus on a participant’s viewpoint as well as presenting in-depth findings rich with participant commentary. The overall goal is to understand “a particular phenomenon from the perspective of those experiencing it” and to gain a more “in-depth description and interpretation of the phenomena being studied.”

In this study, thematic analysis was conducted to assess upper limb surgery post-operative patients’ definition of quality care. Thematic analysis is defined as a “method
for identifying, analyzing, and reporting patterns (themes) within data” ⁸⁰. The themes that are identified from the data set are able to explain points which are relevant to the research question and provide us with greater understanding of the data set ⁸⁰,⁸¹. According to Braun et al., in thematic analysis, the importance of a theme is not measured by the frequency of a response but rather by the impact it has on our understanding of the larger context of the patient’s perspective ⁸⁰.

There are several key advantages for utilizing thematic analysis which include greater flexibility in data analysis process, use in facilitating qualitative analyses to promote policy development, and the ability to summarize key points across large sets of data ⁸⁰. Interestingly, thematic analysis is poorly demarcated and often under-acknowledged despite its wide use within qualitative research ⁸²,⁸³.

In utilizing any qualitative study design, an important factor to consider is how many participants are necessary in order to have meaningful findings from the collected data. Since qualitative research consists of non-probabilistic samples, a different approach than power analysis seen in quantitative research must be used. For qualitative research the technique of data saturation is used when determining appropriate sample sizes ⁷⁴. Data saturation is the point at which more data does not mean that new information is gained ⁸⁴.
RESULTS

Participants

52 post-operative upper limb patients participated in a closed and open ended survey, with 3 prospective participants declining to complete the survey. The demographic breakdown of the patient pool utilized in this study is outlined in Table 4. The average age of participants was 48 and consisted of predominately white, full-time employees that made more than $100,000 per year.

Table 4. Participant Demographics Data: Outlines the demographic information for participants who chose to complete the survey. Some participants did not answer all questions; therefore, some categories contain less than 52 responses.

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 – 29 years</td>
<td>13</td>
<td>25.0%</td>
</tr>
<tr>
<td>30 – 39 years</td>
<td>4</td>
<td>7.7%</td>
</tr>
<tr>
<td>40 – 49 years</td>
<td>5</td>
<td>9.6%</td>
</tr>
<tr>
<td>50 – 59 years</td>
<td>14</td>
<td>26.9%</td>
</tr>
<tr>
<td>60 – 69 years</td>
<td>5</td>
<td>9.6%</td>
</tr>
<tr>
<td>70 – 79 years</td>
<td>4</td>
<td>7.7%</td>
</tr>
<tr>
<td>Over 80 years</td>
<td>3</td>
<td>5.8%</td>
</tr>
<tr>
<td>Did Not Respond</td>
<td>4</td>
<td>7.7%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>24</td>
<td>46.2%</td>
</tr>
<tr>
<td>Female</td>
<td>28</td>
<td>53.8%</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/Non-Hispanic</td>
<td>35</td>
<td>67.3%</td>
</tr>
<tr>
<td>Black or African-American</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Asian</td>
<td>9</td>
<td>17.3%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>9</td>
<td>17.3%</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific Islander</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>5.8%</td>
</tr>
</tbody>
</table>
Table 4. Participant Demographics Continued

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Employment Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-Time Employed</td>
<td>16</td>
<td>30.8%</td>
</tr>
<tr>
<td>Part-Time Employed</td>
<td>4</td>
<td>7.7%</td>
</tr>
<tr>
<td>Retired</td>
<td>9</td>
<td>17.3%</td>
</tr>
<tr>
<td>Don’t Work Outside the Home</td>
<td>4</td>
<td>7.7%</td>
</tr>
<tr>
<td>Disabled</td>
<td>4</td>
<td>7.7%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>6</td>
<td>11.5%</td>
</tr>
<tr>
<td>Student</td>
<td>9</td>
<td>17.3%</td>
</tr>
<tr>
<td><strong>Yearly Household Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $15,000</td>
<td>10</td>
<td>20.0%</td>
</tr>
<tr>
<td>From $15,000 to $29,999</td>
<td>6</td>
<td>12.0%</td>
</tr>
<tr>
<td>From $30,000 to $49,999</td>
<td>5</td>
<td>10.0%</td>
</tr>
<tr>
<td>From $50,000 to $99,999</td>
<td>6</td>
<td>12.0%</td>
</tr>
<tr>
<td>More than $100,000</td>
<td>23</td>
<td>46.0%</td>
</tr>
<tr>
<td>Did Not Respond</td>
<td>2</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

Thematic analysis of the open-ended responses revealed three different themes. These themes consisted of: pre- and post-operative pain and discomfort, pre- and post-operative function, and lack of preparedness and understanding.

**Theme 1: Pain**

Patients discussed pain as being important elements in both their pre-operative and post-operative care. Pre-operatively, pain relief was one of the health outcome goals for patients. Post-operatively, pain was a short term challenge that patients had to cope with during their recovery process.
Resolving Pre-Operative Pain

The theme of resolving pre-operative pain was identified as one of the two primary ways patients defined achieving successful treatment of their problem. Approximately one third of participants identified pain relief as a desired treatment outcome. For example, one patient said successful treatment “means that I can resume normal daily activities without pain and discomfort in my hands.”

Post-Operative Pain

Post-operatively, pain was a common theme and often the sources of pain and discomfort were variable. However, the majority of individuals simply stated that general pain was an issue they had to cope with. One source of pain was described by a patient as due to a post-operative infection, to which she said: “Infection. Infection. Infection! That was the real challenge. That just delayed recovery…some pain because of the infection.” Physical therapy was also a painful process for some individuals. For instance: “The rehab was something I had to do all the time. They were encouraging me to do exercises three times per day and it was painful and I had to push myself.” Another cause of pain or discomfort occurred when patients started using their post-operative hand to perform daily activities again. For example: “[It] hurt a lot to do e-mails, so I got way behind mainly because I had to do it with one hand.”
**Theme 2: Function**

Similar to the first theme, discussion of function also appeared in both pre-operative and post-operative care. Pre-operatively, patients experienced limited functionality and hoped surgery would resolve this issue. While post-operatively many patients struggled with temporary functional limitations as they recovered from surgery.

*Resolving Pre-Operative Function Limitation*

Along with resolving pain, the other way that patients defined achieving successful treatment of their problem was to eliminate their pre-operative functional limitations. Many participants claimed regaining use of their hand meant their treatment was successful. For instance, one patient said their treatment would be considered successful if he or she:

> [Had] full use of my hand if it’s successful…I’ll be able to fish, and work and cut that steak, eat that chicken wing. The main thing is I’ll be able to get back to work once this thing is better.

It was clear that patients wanted to go “back to being healthy, [and that] it heals well and [they] don’t have any setbacks.”

*Post-Operative Function Challenge*

Regaining function in the post-operative hand with a minimization or elimination of pain and discomfort was an important theme that emerged when assessing the challenges many patients faced after surgery. Since the operation was performed with the intention of resolving his or her upper limb problem, many patients wanted to eventually reach a state in which he or she could resume normal activities. The most frequently
described post-operative limitations, involved the inability to perform daily household tasks and personal care, and restriction from recreational activities.

**Daily Household Tasks**

The daily household tasks that were commonly difficult for patients to perform included cooking and cleaning. For instance one patient described that: “Washing dishes took me three times as long to wash.” Another individual described difficult with meal preparation saying that: “I tried to open a can myself and it slipped out of my hand. My daughter went and bought an electric plug in one so I don’t need to do it anymore.”

**Personal Care**

With regard to personal care, patients typically described challenges with sleeping, showering and getting dressed. One patient expressed their difficulty sleeping due to restrictions of post-operative care equipment. For example: “I was given a contraption to keep my arm up in bed but I sleep on my side not on my back so having my arm in this blue foam thing was a challenge.” For another patient, the pain after the surgery caused problems sleeping:

“Immediately after the surgery it was very difficult to sleep. My arm was held in a certain position. My sleep quality was really bad, partially because of the pain and I had to rest my arm on a bunch of pillows. I had to change my position a lot because if I held it in one position for a while it would start hurting.”

Showering was also listed as a large obstacle for patients because they needed to ensure that their hand remained dry. One patient described that they “[had] to shower with [a] bag on [their] arm” and that they faced a challenge when “washing my hair.” With regard
to getting dressed a few individuals pointed out that: “You don’t realize how much is needed with both hands, especially if you have to go to the restroom…where loose clothing because it is difficult to undress.”

Recreational Activities

Aside from daily household tasks and personal care, many patients expressed difficulty in trying to conduct their former recreational activities. For example:

“There are many things associated with the use of your hand and wrist [like] taking showers, going to the bathroom, typing, opening jars, cooking (I actually like to cook but I wasn’t able to cook), riding bicycle, any kind of physical exercises like pushups were impossible, [and] were all difficult….I couldn’t swim for a few weeks due to the stitches.”

With regard to returning to normal daily activities and recreational activities, the overall desire for most patients was regaining functionality of their hand. Since some patients felt that “6 months of not being able to move [their hand] really sucked.”

Theme 3: Lack of Preparedness and Comprehension

Another major theme that was identified included patients not fully understanding their treatment process as well as being underprepared for post-operative challenges. This lack of preparedness and understanding was partly demonstrated though patients’ request for greater explanation of their problem and procedure, while others simply stated the obstacles they were unaware of.
Recovery Expectation Mismatch

One element of post-operative care that patients were unprepared for consisted of misjudging the total time necessary for a patient’s recovery as well as the time off from work that caretakers needed to account for to assist the patient. While some individuals claimed that their recovery process was relatively quick, a larger majority felt that the time to regaining their function was much longer than what they had anticipated. In comparison to the recommendations they had received, one patient said:

To expect the healing to take longer than they tell you…they never really tell you how long it’s going to take. I think they are trying to console you. My therapist told me 6 months before you’re fully back.

The majority of patients relied on another individual to assist them in their post-operative recovery process; therefore, many times caretakers needed to take time off of work. It was pointed out by some patients that they underestimated the time their caretaker needed to allocate to helping them and felt that more time needed to be taken off of work. For example one response to the question: “The person who helped take care of me at home after surgery wished they were prepared for?” was:

More time because they didn’t realize how much time it took out of their schedule…having to adjust to his schedule so that we can do things that I needed. He needed to take more time off.

Some patients noted that it was important for their provider to give a greater explanation of the recovery process timeline. One individual said that providers should: “emphasize the total time it’s going to take [and] don’t underestimate rehab time.” Time expectation also showed up in a more minor context with regard to long commutes.
Methods of Patient Education by Provider

Many patients expressed wanting more in-depth explanations of their health condition and surgical procedure in order to better understand what was actually taking place in their hand and what approach their doctor wanted to take in treating it. For instance:

I would have liked to have gotten a full explanation of: “this is what’s going on with your wrist”, like with the skeleton model. I was explained some stuff, but not to the level of detail I would have liked. I felt I got a better explanation from my PT. I would have preferred this from my doctor. I think he was a bit unsure with what needed to be done. [Also] they should bust out the X-rays. They gave me the DVD but didn’t explain what I was looking at. It would have been nice to have it explained.

It is evident from this account that some individuals find it helpful to get as many details as possible from their physician. It may actually serve to assist them in feeling more confident about decisions with regard to their treatment plan as this individual points out:

It would have been nice to have understood more about the testing process that got me to this point. I got scared when they told me I would lose muscle mass in my hand, so I reacted to that. Some people don’t want explaining but for me it helps me make better judgements.

This statement highlights a subcategory of anxiety and fear for this theme of under preparedness. Many patients were concerned with complications from anesthesia or pain killers. For instance one patient felt that physicians should give: “more warning [on] the side effects of oxycodone. For some people the side effects are pretty bad and I was one of them.” Others expressed concern about possible drug interactions and suggested to: “caution the patient if they are on certain medications and explain why you can’t take it and if I forgot and take it what would happen.”
As part of further explaining the patient’s problem and their treatment options, some participants highlighted the importance of recognizing various mechanisms of explaining what is occurring to a patient. For example: “I like a visual. If you can drag a pretend bone and show this is what happened, and this is what we did, and this is what’s going to happen next.” Also noted is the need for simplifying explanations so that they are well understood. One patient suggests that physicians “use pure English; no medical terms or if you do then break them down to normal speech.”

Alternatively, some individuals were hoping that their physician could direct them to other sources of information which they could use to further their understanding of their condition and the treatment options. Such as “possibly direct[ing] them to a reputable website [or] pamphlets.” Or specifically “if there were any really recommended sites for holistic healing, to be able to do some research on that.”
DISCUSSION

As the healthcare system continues to shift towards patient-centered care and utilizing a value-based model, it is imperative that we are able to identify patient values and expectations with regard to upper limb surgery. From our study, we identified three key themes that address what patients value with regard to upper limb surgery. These themes encompassed concerns with regard to resolving pain, regaining function, and a lack of patient preparedness and understanding for post-operative challenges.

Our findings indicate that eliminating pain and regaining function were the desired health outcomes for most patients following upper limb surgery and the most prominent explanation for successful treatment of a person’s problem. This is supported by previous research findings that pain and improving physical function are the two leading reasons patients seek medical treatment and undergo orthopaedic surgery\textsuperscript{23,85,86}. Furthermore, studies have shown a positive correlation between increased patient satisfaction and the ability to return to work, higher physical functionality scores on Sickness Impact Profile (SIP), and decreased pain intensity\textsuperscript{87}.

According to the American Academy of Orthopaedic Surgeons, pain is a common consequence following orthopaedic surgery and was therefore an expected result\textsuperscript{88}. One study showed that 3\% of post-operative patients visited the emergency department (ED) within 30 days of surgery and of those visits, 66\% occurred during the first two weeks. Of all post-operative hand surgery patients, 18\% of those patients came to the ED due to pain\textsuperscript{89}. Of other pain related issues that patients faced during their post-operative care,
one was surgical site infection (SSI). The literature supports that SSI rates in upper limb surgery is very minimal and uncommon\textsuperscript{90}. Our results align with these findings since only one of our participants identified complications with infections. Further exploration as to possible confounding factors would need to be addressed with this example since our results do not address whether this SSI was due to operative or post-operative care shortcomings\textsuperscript{91}.

Based upon the responses from patients seeking care to reach these desired health outcomes, the key barrier to receiving quality care was identified as patients feeling that they were inadequately prepared for their post-operative demands. This unpreparedness was broken down into two subcategories consisting of: misjudgment of recovery time, and lacking adequate understanding of their condition and treatment procedure.

The importance of identifying these two elements with regards to patients being unprepared for upper limb surgery is that they identify areas in which physicians can improve how patients are educated about their health and treatment options. Pre-operative information should to be easily understood by patients and given in both a verbal and written format to promote patient cooperation and understanding\textsuperscript{92,93}. Furthermore, pre-operative education has been shown to have a large impact on reducing patient anxiety, improving patient satisfaction, and improved health outcomes\textsuperscript{12}. Other studies have shown that patients want to get more information about pre- and post-operative care, especially with regard to pain management\textsuperscript{94,95}.

Lastly, patient education is part of the IOM’s third aim with achieving patient-centered care (Table 3). It is important that patients fully understand their treatment
options and procedures so that they are able to be active participants in the shared-decision making process with their physicians. As part of the patient-centered care model, the physician has the responsibility to help facilitate an environment in which patients can feel comfortable discussing their personal health. By recognizing what patients identify as challenges in their treatment, we can implement quality improvement initiatives to change processes in care delivery.

Eliminating pain and regaining function can be classified within Donabedian’s outcome domain while patient unpreparedness and lack of comprehension can be classified under the processes domain. Knowledge of these themes can inform quality measures that evaluate patient education processes, as well as facilitate improvement in pain and function as outcome measures. Both process and outcome domains are important in tracking quality improvement efforts in the health care system. Ultimately, a combination of both process and outcome measures are needed to improve quality of care, and focusing on one single domain will likely not lead to improved care.

Limitations on this study primarily resulted from implementing a paper-based survey as opposed to using an interview based model. By simply allowing patients to complete the survey at their convenience during their appointment, some responses were short in length or incomplete. Furthermore, the opportunity for a research fellow to ask follow up questions and have participants elaborate on their responses to gain a deeper understanding of a patient’s response was lost. Improvements and further studies would include changing from a paper survey to an in person interview in order to enhance the quality of data obtained. By implementing an interview model, we could focus on
understanding what the possible causes were that led patients to not be prepared for post-operative challenges. Some examples of these possible causes may include: inadequate length of appointment time, physician not facilitating this conversation, underestimating demands of post-operative care, patients feeling uncomfortable discussing this topic further with their surgeon, or a health literacy barrier to understanding what is being presented during the appointment.

**Conclusion**

The importance of patient-centered care in today’s healthcare system requires physicians, health systems, and payers to focus their delivery of care around a partnership with the patients they treat. In creating that relationship, physicians need to account for a patient’s values, beliefs, preferences, and expectations. We identified three key themes that address the patient perspective in patient-centered care. Pain and function were both pre- and post-operative concerns. Specifically, elimination of pre-operative pain and regaining function were outcome-based themes of high quality care that highlight the expectations of patients. Post-operatively, pain and function were short term consequences from having undergone surgery. The lack of preparation and understanding can be understood as process-based quality measures and helped identify areas in which healthcare delivery methods need improvement.

Utilizing these findings, we can change the way conversations between physicians and patients are conducted. Specifically, we can focus on improving how patients are counseled and prepared before surgery so that they can better understand what to expect
post-operatively. Furthermore, by providing patients with post-operative care and expectation handouts, we may improve patient satisfaction. Ultimately, these changes in the process of how care is delivered to patients could lead to improvements in a patient’s overall health outcomes.
LIST OF JOURNAL ABBREVIATIONS

Am J Neuroradiol  American Journal of Neuroradiology
BMC Health Serv Res  BioMed Central Health Service Resources
BMC Med  BioMed Central Medicine
BMJ  British Medical Journal
Clin Orthop  Clinical Orthopaedics and Related Research
Clin Plast Surg  Clinics in Plastic Surgery
Cochrane Database Syst Rev  Cochrane Database of Systematic Reviews
Eff Clin Pract ECP  Effective Clinical Practice
Eur J Cancer Care (Engl)  European Journal of Cancer Care (England)
Hand Clin  Hand Clinics
Health Aff Proj Hope  Health Affairs (Project Hope)
Health Commun  Health Communication
Health Serv Res  Health Services Research Journal
Int J Qual Health Care  International Journal for Quality in Health Care
J Adv Nurs  Journal of Advanced Nursing
J Am Coll Surg  Journal of the American College of Surgeons
J Biomed Inform  Journal of Biomedical Informatics
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REFERENCES


CURRICULUM VITAE

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EDUCATION

Boston University School of Medicine – Boston, MA
Masters of Science in Medical Sciences, May 2016

University of California, Los Angeles – Los Angeles, CA
Bachelors of Science in Biochemistry, June 2013

HOSPITAL EXPERIENCES

Research Assistant: Department of Orthopaedic Surgery    Stanford University
September 2015 - Present
  • Conducted cross-sectional study to establish patient derived quality measures in upper limb post-operative patient
  • Evaluated patient opinions on the discussion of surgical healthcare costs with their provider

UC Davis Department of Surgery Pre-Medical Surgical Internship    UCDMC
Pre-med Intern, January 2014 – June 2014
  • Shadowed physicians from the Department of Surgery to gain a direct understanding of the daily demands of surgeons
  • By rotating through twelve different surgical specialties, I observed a variety of surgical procedures such as a tumor resection, total thyroidectomy, mitral valve repair, and stent placement.
  • In conjunction with shadowing, I completed a rigorous academic curriculum focused on current healthcare issues

Assessing Resident C-ICARE (ARC)    UCLA
Director of Program Admissions, June 2011 – June 2013
  • Developed new marketing strategies to recruit prospective applicants by incorporating social media, information sessions, and mass departmental e-mailing
  • Created application and interview questions as well as respective scoring rubrics to ensure calibrated evaluations
  • Managed the scheduling and notification for over 100 interviews
  • Coordinated fifteen team members in the review and selection of our new team from over 300 highly qualified applicants
Pediatric Co-intern, September 2010 – June 2013
- Continued my volunteer responsibilities of surveying patients
- Compiled weekly data reports via Excel to track and show resident performance percentages
- Maintained cumulative data reports showing individual resident yearly performance
- Tracked yearly shifts in patient feedback about each resident through statistical analysis
- Presented data findings to Pediatric Resident Program Director
- Attended and presented at monthly meetings
- Trained new volunteers at both UCLA Ronald Regan Medical Center and Medical Plaza and Santa Monica Medical Center and Orthopedic Hospital

Volunteer, September 2009 – June 2013
- Interviewed patients to obtain feedback on their care by medical residents
- Inputted survey data into excel database
- Attended monthly meetings with all program members

COMMUNITY SERVICE

Rachel’s Women’s Center
Volunteer, August 2013 – January 2014
- Assisted with serving meals, collecting donations, and supervising shower room
- Interacted with women from a wide variety of backgrounds

Academics in the Commons
Peer Mentor, March 2010 – January 2011
- Co-developed workshops designed to academically assist undergraduate students
- Helped incoming students plan and organize courses and campus involvement activities

EMPLOYMENT HISTORY

Private Tutor
Instructor, August 2009 – Present
- Created individualized tutoring for math and science courses
- Communicated directly with parents about their child’s performance

Mathnasium/ Tutoring Club
Instructor, July 2013 – January 2014
- Worked with students from grades K-12 on their academic needs
- Specifically assisted students with math and science homework
- Organized student portfolios to monitor academic progression