

EXPERIENCE REPORT

Enhancing knowledge of authorization requests through registry development

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Abstract

Understanding the member population to which medical coverage policies apply is important for ensuring the relevance of a health insurer's policies. The medical policy unit of our company developed a registry and workflow to enhance our knowledge about the members who seek authorization for bariatric surgery. Data captured in the registry have allowed us to construct a descriptive profile of the entire population that seeks bariatric surgery (both members who are approved and members who are denied). In addition, we have examined characteristics associated with denied authorization requests, determined the proportion of requests originating from specific insurance products, and studied the relationship between results on a specific laboratory test and authorization decisions. Given the growing importance of data in the realm of health care management, this article is an important demonstration of how data can be used to understand populations of members who are affected by medical policies.

KEYWORDS

bariatric, registry, research, policy, workflow

1 | INTRODUCTION

Health insurers are a crucial part of health care systems and have a responsibility to provide wise medical coverage decisions for their members. Coverage decisions are determined by regulations, benefits, and medical policies, with each insurer developing its own company-specific policies. It is essential that medical coverage policies be written in a manner that promotes the best health for insured members while aligning with the mission of a company. Sometimes, there is insufficient evidence on a new procedure or drug to know for sure which patients will benefit from it most and which may not benefit at all.

As part of an academic health system, our organization strives to maximize the knowledge obtained from data we collect. Current research in the industry relies heavily on administrative claims^{1,2} that are useful for providing data about use and costs. However, there are other sources of information that can be informative to medical policy decisions that remain largely untapped. Claims data do not

contain information that is submitted as part of pre-authorization requests (such as clinical measurements and laboratory values). Additionally, data from claims do not contain information about members who were denied authorization for a procedure. A source of data beyond claims can be helpful for providing a more complete profile of a member population seeking services. We are currently working to expand knowledge at the juncture between the medical-policy setting and the subset of members who are affected by coverage decisions. The mechanism we have chosen to increase our knowledge in this area is the development of registries.

The need for a registry to record member-level information surrounding certain procedures first became apparent, as the medical policy unit at our company planned a revision to the coverage policy for bariatric surgery. Anecdotal stories and opinions about bariatric surgery were prevalent, but no one was able to provide information derived from an aggregate collection of authorization requests.

To address the uncertainty about details contained in requests for bariatric surgery, we developed a registry of bariatric surgery requests containing data to inform future policy decisions. The registry records

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information from medical records, submitted as part of the pre-authorization process for bariatric surgery. This paper describes the development of the registry and workflow to incorporate the registry into the process of medical pre-authorization review. Results from a descriptive analysis of the population seeking surgery are presented, along with an examination of characteristics of members whose pre-authorization requests for bariatric surgery are initially denied. Two examples of how the registry has broadened our knowledge about the pre-authorization requests received by our company are presented.

This report is relevant for health systems because it demonstrates an approach for gathering meaningful data from an operational process. Data are the foundation for information, which ultimately leads to knowledge. Analyzing data from authorization requests has allowed our company to be more aware of approval patterns for requests and has provided the basis for us to learn more about factors that influence medical decisions.

2 | METHOD

This study was reviewed and approved by the Institutional Review Board of our institution (IRB number IRB00084964).

2.1 | Registry design

The initial step in developing a registry was to determine the proper electronic platform to be used. We chose to use Microsoft Access (Microsoft Corp, Redmond, Washington) because of 2 features considered to be of great importance: It is compatible with a variety of data analysis programs, and it provides the ability to develop a user-friendly electronic data entry form. Both of these considerations were important for ensuring the functionality and usefulness of the registry. After deciding upon the software to be used for registry development, we identified the data fields to be included in the registry. Variables that are important when making authorization decisions were identified through literature reviews and interviews with medical directors. Health conditions that are associated with candidates for bariatric surgery were identified from literature, while conversations with medical directors revealed laboratory measures that were worthy of recording. A data dictionary was developed to provide a framework for the fields to be developed in the database (Table 1). Each of the fields is able to be populated from information included in authorization requests. Because of the limited demographic information included in pre-authorization requests, the registry similarly contains limited demographic information.

Development of the database within access occurred through a 2-step process. The first step involved creating a data field for each metric that was planned to be recorded, and the second step focused on generating electronic data entry forms. Because of the large quantity of data fields included in the registry, multiple data entry forms were created with each form containing a limited set of related variables. For example, a form containing only comorbidity and laboratory data was developed. A total of 4 forms were developed to facilitate entry of data from pre-authorization forms: member information, comorbidities and labs, pre-op weight and body mass index, and authorization

and surgery. The data fields on each of these forms were a mixture of drop-down boxes and numerical fields. Data fields allowing free-text entry were limited because of the challenges free text presents when performing data analysis.

Confidentiality was an important consideration when designing the registry. The purpose of the registry is to provide population-level knowledge of presurgical measures of individuals seeking bariatric surgery, and therefore, we minimized the entry of protected health information from medical records to the registry. Each medical record is assigned a randomized identification number (termed study ID), and a separate key has been created containing a link between study ID numbers and member identification numbers. The linking file is necessary to enable future studies that will combine information from authorization requests and claims records.

2.2 | Incorporation into workflow

With the registry developed, we established an operational process to capture the information. Given the business needs of the company and our responsibilities to members, it was necessary to develop a process that was minimally intrusive on the day-to-day operations for reviewing authorization requests so as not to delay determinations. An effective process for collecting data for the registry was accomplished via the incorporation of a single additional step into the typical workflow surrounding pre-authorization requests for bariatric surgery (Figure 1). The standard business protocol for reviewing requests that are made for bariatric surgery is as follows: A member's pre-authorization forms are sent to our company. The information is transmitted to a medical review nurse. Once a medical review nurse determines that all required information has been submitted, the request is reviewed by a medical director. The medical director reviews the pre-authorization request and makes a decision about whether the surgery is authorized for payment by the insurance plan to which the member belongs. The medical review nurse is informed of the decision and takes the appropriate steps to inform the member's physician of the decision regarding authorization for bariatric surgery.

The bariatric registry has been incorporated into the standard business workflow via the addition of a step in which the medical review nurse sends copies of the pre-authorization forms, including the medical director's decision to approve or deny the request, to a medical policy research associate (MPRA). The MPRA assigns a randomized study ID to each pre-authorization packet and enters relevant information to the registry. These additional steps occur without any disruption to the normal time frame for pre-authorization request reviews. The MPRA is employed by our company to perform a variety of research tasks, and the time required for entry of data to the registry has not had an adverse impact on that person's overall productivity.

2.3 | Analysis

Analyses of data collected from pre-authorization forms have been performed using SAS version 9.4 (SAS Institute Inc, Cary, North Carolina). Figure 2 provides an overview of questions that have been answered using data stored in the registry. The ovals in the figure depict the statistical approach for addressing each question.

TABLE 1 Kuntz-Melcavage et al

Name	Description
Database identifier	Unique number assigned to database entry
Study identifier	Number assigned to member seeking pre-authorization for bariatric surgery
Member gender	Gender of member seeking pre-authorization
Age	Age of member seeking pre-authorization for bariatric surgery at time of application
Line of business	Line of business of which member seeking pre-authorization is a member
Date of letter seeking authorization	Date that appears on the cover letter that was sent to seek pre-authorization for bariatric surgery
Date of disenrollment	If member disenrolls during study period; date on which member disenrolled
Date of baseline measurements	Date on which baseline measurements of weight and BMI were made
Baseline weight	Baseline weight (rounded to nearest whole number)
Baseline BMI	Baseline BMI (body mass index)
Date of 1-month postbaseline measurements	Date on which measurements of weight and BMI 1 month after baseline were made
One-month postbaseline weight	Weight at timepoint approximately 1 month after baseline measurement (rounded to nearest whole number)
One-month postbaseline BMI	BMI at timepoint approximately 1 month after baseline
Date of 2-month postbaseline measurements	Date on which measurements of weight and BMI 2 months after baseline were made
Two-month postbaseline weight	Weight at timepoint approximately 2 months after baseline (rounded to nearest whole number)
Two-month postbaseline BMI	BMI at timepoint approximately 2 months after baseline
Date of 3-month postbaseline measurements	Date on which measurements of weight and BMI 3 months after baseline were made
Three-month postbaseline weight	Weight at timepoint approximately 3 months after baseline (rounded to nearest whole number)
Three-month postbaseline BMI	BMI at timepoint approximately 3 months after baseline
Date of 4-month postbaseline measurements	Date on which measurements of weight and BMI 4 months after baseline were made
Four-month postbaseline weight	Weight at timepoint approximately 4 months after baseline (rounded to nearest whole number)
Four-month postbaseline BMI	BMI at timepoint approximately 4 months after baseline
Date of 5-month postbaseline measurements	Date on which measurements of weight and BMI 5 months after baseline were made
Five-month postbaseline weight	Weight at timepoint approximately 5 months after baseline (rounded to nearest whole number)
Five-month postbaseline BMI	BMI at timepoint approximately 5 months after baseline
Date of 6-month postbaseline measurements	Date on which measurements of weight and BMI 6 months after baseline were made
Six-month postbaseline weight	Weight at timepoint approximately 6 months after baseline (rounded to nearest whole number)
Six-month postbaseline BMI	BMI at timepoint approximately 6 months after baseline
Date of 7-month postbaseline measurements	Date on which measurements of weight and BMI 7 months after baseline were made
Seven-month postbaseline weight	Weight at timepoint approximately 7 months after baseline (rounded to nearest whole number)
Seven-month postbaseline BMI	BMI at timepoint approximately 7 months after baseline
Comorbidities	Comorbidity noted in letter requesting authorization for bariatric surgery
Comorbidities 2	Comorbidity noted in letter requesting authorization for bariatric surgery
Comorbidities 3	Comorbidity noted in letter requesting authorization for bariatric surgery
Comorbidities 4	Comorbidity noted in letter requesting authorization for bariatric surgery
Comorbidities 5	Comorbidity noted in letter requesting authorization for bariatric surgery
TSH laboratory results	Laboratory results for thyroid-stimulating hormone
Total cholesterol	Laboratory results for total cholesterol level
Triglycerides	Laboratory results for triglycerides level
LDL cholesterol	Laboratory results for LDL cholesterol level
HbA1c laboratory results	Laboratory results for hemoglobin A1c level
Complete?	Has all available information been entered to the comorbidities/lab form?
<i>H. pylori</i> laboratory results	Laboratory results for <i>Helicobacter pylori</i> test
Type of surgery requested	The type of surgery that is requested (open or laparoscopic)
Initial determination	Initial authorization determination (yes or no)

(Continues)

TABLE 1 (Continued)

Name	Description
If no, action taken after initial denial	If initial authorization determination was <i>no</i> , what action was taken after denial (peer-to-peer discussion, appeal 1, appeal 2, none)
Did reapplication occur?	Did reapplication occur?
Outcome of reapplication?	Approval or denial of reapplication submission?
Did a peer-to-peer consult occur?	Whether a peer-to-peer consult occurred
Was initial determination overturned or upheld?	Following action taken after the initial denial, was the initial determination overturned or upheld? (overturned, upheld, NA)
Outcome of peer-to-peer consult	If a peer-to-peer consult occurred, was the outcome of the consult an approval of bariatric procedure or a denial of bariatric procedure?
Did a first-level review occur?	Whether a first-level review occurred
Outcome of first-level review	If a first-level review occurred, was the outcome of the review an approval of bariatric procedure or a denial of bariatric procedure?
Did a second-level review occur?	Whether a second-level review occurred
Outcome of second-level review	If a second-level review occurred, was the outcome of the review an approval of bariatric procedure or a denial of bariatric procedure?
Did an outside consult occur?	Whether an outside consult occurred
Outcome of outside consult	If an outside consult occurred, was the outcome of the consult an approval of bariatric procedure or a denial of bariatric procedure?
Date of bariatric surgery	Date on which bariatric surgery was performed
Type of bariatric surgery	Type of bariatric surgery that was performed
Facility	Facility at which bariatric surgery was performed
Name of surgeon	Name of surgeon who performed bariatric surgery

Abbreviation: LDL, low-density lipoprotein; NA, not applicable.

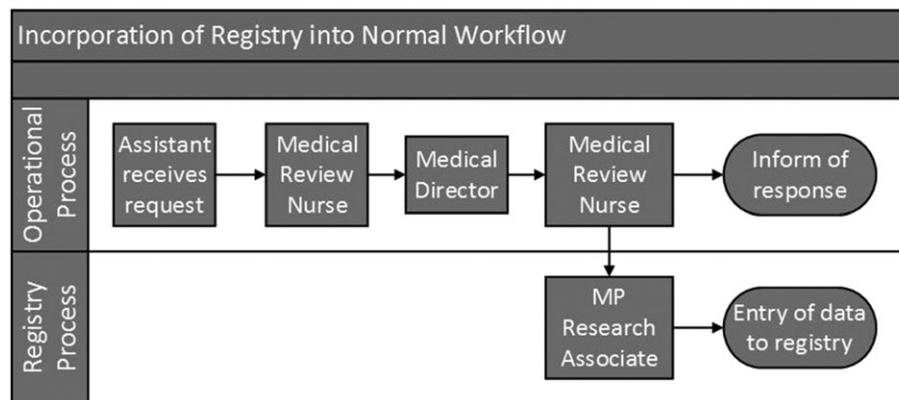


FIGURE 1 Maintaining a registry of a select population of members requires minimal disruption to normal business workflow for reviewing preauthorization requests. MP, medical policy

A descriptive analysis was performed on the entire population of cases in the registry. Variables examined in this analysis were gender, age, body mass index, approval decision, and selected comorbidities known to be prevalent among individuals who seek bariatric surgery. Means or percentages were calculated, as appropriate, for each variable.

Logistic regression was performed to examine the relationship between review decision and 7 variables reported on authorization applications. The initial review decision (approval vs denial) served as the outcome variable in our statistical model, and predictor variables were age, gender, hypertension, diabetes, obstructive sleep apnea, back pain, arthritis, and gastroesophageal reflux disease (GERD).

The amount of applications that originated from each insurance product managed by our company was calculated and compared with the proportion of total enrollees in each insurance product. A z test

was used to examine the significance of the difference between proportions.

The presence of a *Helicobacter pylori* test in applications and the resulting approval decision was examined for requests originating from one specific facility. Proportions were calculated to examine approval decisions (approved or denied) and test result (positive or negative). A chi-square test of independence examined whether a difference in approval rates exists between applicants with positive test results vs applicants with negative test results.

3 | RESULTS

Using the new workflow to enter data into the bariatric registry, all authorization requests for bariatric surgery that were submitted to

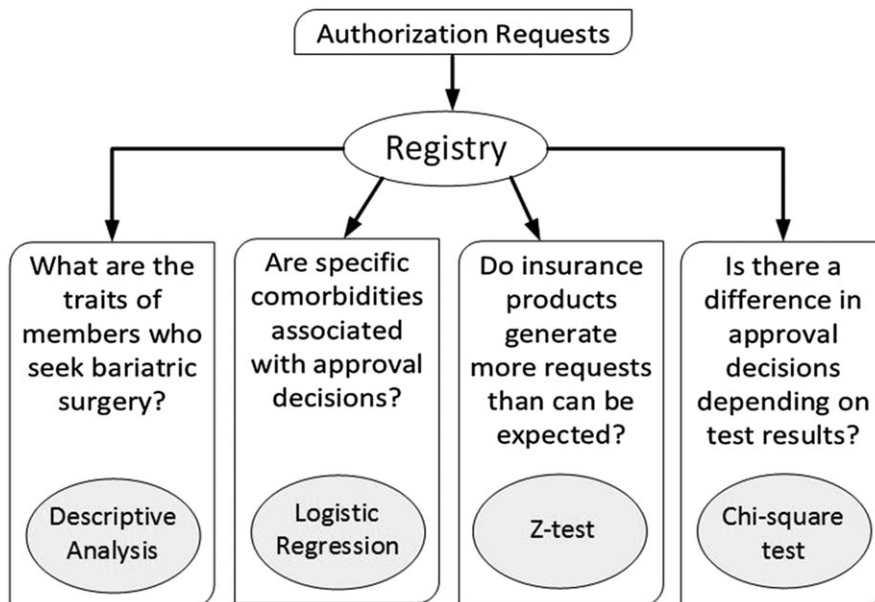


FIGURE 2 The registry has been used to answer multiple questions. A variety of statistical approaches have been used to examine registry data

our company beginning July 1, 2013, have been entered, and the registry is continuously updated. Descriptive statistics about the population seeking bariatric surgery are provided below.

3.1 | Population overview

The data analysis described in this publication is based on data collected from pre-authorization requests submitted during the first 40 months of the registry's existence. During this time, 504 members applied for bariatric surgery pre-authorization, and of those, 87% were female. The age distribution of members seeking bariatric surgery was normally distributed (Figure 3), with an average age of 41 years. The minimum age was 13 years, and the maximum age was 65 years. Only 2 applicants were under the age of 18, both of whom were female.

We examined 3 of our company's insurance products: a commercial plan, a Medicaid plan, and a plan for military dependents and retirees. Of the members in the registry, 19% (n = 97) are members of the commercial plan, 71% (n = 359) are members of the Medicaid plan, and 10% (n = 48) are members of the military plan (Figure 4).

The prevalence of selected comorbidities that were reported on letters requesting prior authorizations for surgery is depicted in

Table 2. Hypertension was reported in nearly half of applicants, and obstructive sleep apnea was reported in 37% of applicants. Arthritis was the least reported comorbidity among those recorded in the registry.

3.2 | Logistic regression

Reported presence of GERD decreased the odds of denial of authorization requests for bariatric surgery (odds ratio, 0.573; 95% CI, 0.331-0.993; P = .0470). None of the other comorbidities examined were deemed to be significant because the confidence interval crossed 1.

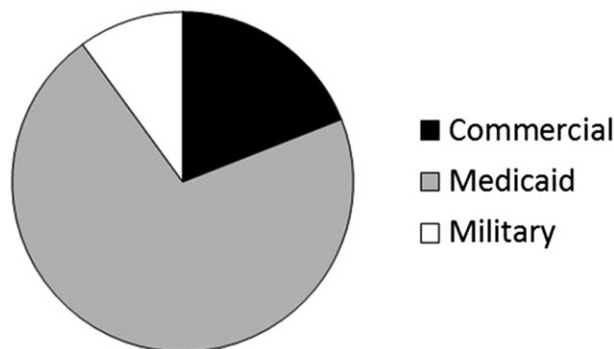


FIGURE 4 The majority of applications for bariatric surgery emanated from Medicaid members

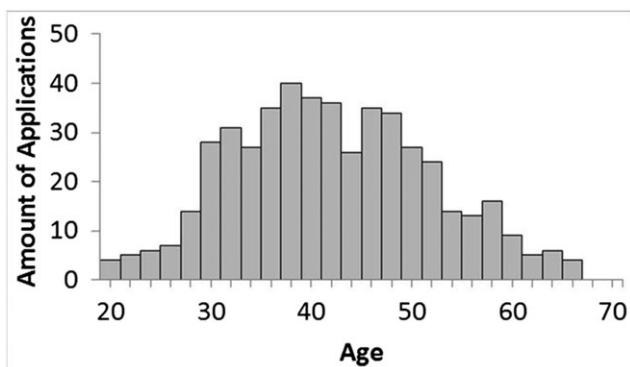


FIGURE 3 The ages of members seeking bariatric surgery are normally distributed

TABLE 2 Kuntz-Melcavage et al

Comorbidity	Percent
Hypertension	49
Diabetes	27
Obstructive sleep apnea	37
Back pain	16
Arthritis	6
Gastroesophageal reflux disease	23

3.3 | Origin of surgery requests

Most requests for bariatric surgery originate from Medicaid members. Total member enrollment is also greatest for Medicaid. The percent of total requests for bariatric surgery that can be attributed to each insurance product is displayed in the *requests* column of Table 3. The percent of total enrollment that can be attributed to each insurance product is displayed in the *enrollment* column of Table 3. For both the commercial product and the Medicaid product, no significant difference existed between the proportion of members who apply for bariatric surgery and the proportion of total enrolled members who belong to each product ($P = .514$ and $P = .493$). A z test was not performed for the military health plan because less than 30 applications exist in the registry for this insurance product.

3.4 | Relationship between approval decisions and laboratory results

Total requests from one facility in the registry were examined to determine the relationship between approval decisions and results of *H. pylori* tests. A total of 209 requests were identified, and of those, 19% ($n = 39$) did not contain *H. pylori* test results. Among requests containing *H. pylori* test results, no significant difference in approval decisions was detected (Figure 5).

TABLE 3 Kuntz-Melcavage et al

Line of Business	Requests	Enrollment
Commercial	.17	.15
Medicaid	.76	.73
Military	.07	.12

		Authorization Decision	
		Approved	Denied
H. pylori Test Result	Positive	14	4
	Negative	131	21

FIGURE 5 No significant difference in authorization decision exists depending on the result of a *Helicobacter pylori* test. *H. pylori*, *Helicobacter pylori*

4 | DISCUSSION

Identifying a need for data regarding the population of members who seek bariatric surgery led us to develop a data collection workflow and a registry that has enhanced our knowledge about this population. Because operational efficiency is important in the health insurance industry, research may not always be prioritized and may be impeded by limited data collection or insufficient analytic tools. The present report demonstrates a simple addition to a standard medical review workflow that has greatly increased knowledge about a specific population of insured members.

The registry has provided us with a tool to answer questions about members seeking bariatric surgery. We are now able to provide an accurate description of the members who seek bariatric surgery, and we can examine data to discover trends that may affect authorization decisions. For example, an association was detected for GERD in the results from the logistic regression analysis. It is possible that when reviewers notice GERD on an authorization application, they are inclined to approve the request. Further study of this observation could include interviews with medical directors to determine whether they feel GERD places members at a higher need for bariatric surgery. Discovering approval patterns that have previously gone unnoticed is a benefit of capturing pre-authorization data in a registry. One could envision an automated decision tool resulting from the collection and analysis of authorization data.

Some assumptions have been supported by data that have been captured, while others have been called into question. We can now verify that most applications for bariatric surgery originate from female members. In a previous study of bariatric surgery, Fuchs et al reported that in a population of nearly 190 000 patients who underwent bariatric surgery, 80% of the patients were female.³ We can now confidently state that the prevalence of females who seek bariatric surgery in our insured population agrees with other reports of groups seeking bariatric surgery.

The comparison of proportions of members in each insurance product who seek bariatric surgery has been enlightening and resulted in questions that require further study. The predominance of applications originating from Medicaid members has historically been attributed to the socioeconomic barriers faced by many who are eligible for government assistance. Challenges that include limited access to healthy food, a negative environment, and detrimental behavior are more prevalent among population that is eligible for Medicaid.^{4,5} Surprisingly, we observed that the proportions of applications for bariatric surgery are similar between Medicaid members and members enrolled in commercial insurance. We plan to delve further into this finding by examining approval rates among the populations and overall health status of applicants at the time of application.

Our report of laboratory results and approval decisions is an example of the use of a registry for enhancing knowledge among the medical policy unit. This report was prompted by a provider inquiry regarding the necessity of *H. pylori* test results for making approval decisions. Our analysis determined that there is not a significant difference in approval decisions depending on whether *H. pylori* test results are positive or negative. Because medical review involves a more complete assessment than merely considering 1 test result,

one cannot conclude that the test is unnecessary for the approval decision process. However, based on this knowledge, a policy revision has been made that eliminates the need for a specific test but includes a more general statement regarding the necessity of gastrointestinal health.

The importance of registries for monitoring health care quality has been documented, along with the observation that there is currently ample opportunity to develop medical registries in the United States.⁶ Our work demonstrates the feasibility of developing condition-specific registries using a modest amount of resources and having a minimal impact on established business workflows. A prominent health insurer within United States has previously reported on the positive impact of its disease registries on patient safety, quality improvement, cost-effectiveness, and research.⁷ Because these areas are places where most health care companies seek to improve, it is reasonable to conclude that registries can be instrumental for helping health insurers achieve their goals. While large insurers may have the analytics in place to examine data from subpopulations, there is room for smaller companies to improve their abilities to remain informed about specific groups of members. The process of extracting and recording data from all pre-authorization requests generates data that are not available via claims records because requests that are denied will never appear as claims. Just as this tool has helped us ensure that our medical policy is relevant and fair for the subpopulation to which it applies, future registries will be developed as a means to improve the quality of our medical policies.

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