

PMCs for Quality, Costs & RM

Wanda Young, Sc.D, President of The Pittsburgh Research Institute, discusses Patient Management Categories (PMCs), an alternative patient classification system to DRGs, and their successful use in a number of diverse applications, including hospital cost, utilization, and quality management. She demonstrates more-over how analyses of all three of these areas can be conducted using PMCs to gain a comprehensive understanding of the entire delivery system.

As an analytical tool, the DRG unit of analysis has a fundamental weakness: it is not clinically specific enough to be linked with effective medical care processes. For this reason, providers and those responsible for paying the rising health care bill are seeking other more clinically specific systems to assist in understanding hospital operations.

Patient Management Categories (PMCs) are one such patient classification that has been used effectively not only as the basis for hospital cost-finding and payment (per case and budget allocation), but also to monitor the case mix complexity of a hospital's clinical programs, to manage the allocation of resources among clinical programs within a hospital, and to assess quality indicators across hospitals. PMCs have been used with routinely collected diagnosis and procedure data, including ICD-9, ICD-9-CM, OPCS-4, and the French Catalogue of Procedures. In fact, the clinical specificity of PMCs has enabled investigators in Germany to assign patients directly to the appropriate categories without the need to codify the more detailed diagnosis and procedure data.

PMCs were defined by physicians and thus are clinically specific aggregations of patients who have similar diagnostic and treatment requirements. The PMC classification algorithm incorporates severity distinctions (thus dispensing with the need for a separate severity scoring system or overlay), and identifies specific comorbidities and complicating factors by assigning more than

one PMC to each patient's record where appropriate.

In addition to defining patient categories, physician panels also identified a clinical management strategy for each PMC that identifies the typical resources necessary for the effective treatment of a particular condition. These clinical management strategies are referred to as Patient Management Paths. The availability of these resource expectations provides the basis of the normative cost-based relative intensity score (PMC-RIS) assigned to each patient record by the PMC software. The advantage here is that normative weights are not influenced by inefficiencies that exist in current delivery systems, inefficiencies which do impact the relative weights that are empirically derived from charges or lengths of stay (as are DRG weights).

What follows are examples of actual applications of PMCs for diverse purposes, specifically payment, resource management, and quality assessment.

Hospital Financing

Currently, a number of regional Blue Cross/Blue Shield Plans (the largest private, non-government insurers in the United States) are using the PMC system as a basis for hospital payment. For example, Blue Cross of Western Pennsylvania (the fifth largest Blue Cross/Blue Shield Plan in the U.S. in terms of enrollment, with nearly \$6 billion in annual revenues) has used the PMC cost-based relative intensity score (PMC-RIS) since 1985 to adjust and compare the budgets of each of 90 hospitals with the cost performance of their respective peer groups. If a hospital's proposed operating budget is within the predicted peer-group range, the budget is accepted by the insurer as the basis for payment. If the proposed budget is more than expected based on case mix intensity, volume, and peer group unit price, a more detailed budget review is initiated.

Blue Cross/Blue Shield of Iowa uses PMCs to establish a hospital-specific and a peer-group unit price for each clinical product line eg, cardiac surgery, premature infants, and drug and alcohol abuse. The PMC-RIS assigned to each patient

(adjusted for complications and comorbidity) is then multiplied by both the hospital-specific unit price and the peer-group unit price within each product line. The hospital is paid the lower of the two possible payment amounts.

Unlike the DRG per case payment methodology where there is only one unit price per hospital, this methodology incorporates product costing by line of business along with disease-specific intensity scores based on physician expectations for effective care. An advantage of this payment method is that it adjusts for unit prices that may differ dramatically across patient groups instead of setting the unit price at one level for all patient types as is done in DRG-based prospective payment. For instance, as shown in *Exhibit 1*, the unit price for uncomplicated new-borns is \$1040, whereas the unit price exceeds \$2,600 for surgical cardiac conditions. In addition, a great deal of differentiation is reflected by the average PMC Relative Intensity Score (PMC-RIS) for each product line. Such differentiation does not occur using DRGs because of the compressed range of the empirically-defined relative weights associated with DRGs.

Since the PMC-RIS is based on resource expectations defined by physician panels and described in related Patient Management Paths (rather than by actual services delivered), payment incentives can be translated into acceptable measures of performance and productivity.

Exhibit I

PMC Payment Pricing by Clinical Program
Sample Hospital

PMC Defined Service	Average PMC-RIS	Hospital Specific Unit Price	Average Payment/Case
Drug & Alcohol			
Adult	2.844	\$ 1073	\$ 3051
Adolescent	2.673	\$ 1474	\$ 3940
Psychiatric			
Adult	1.369	\$ 2573	\$ 3522
Adolescent	1.275	\$ 2363	\$ 3013
Newborns			
Uncomplicated	0.621	\$ 1040	\$ 646
Premature/Complicated	2.476	\$ 1788	\$ 4427
Delivery			
Cesarean	1.654	\$ 1395	\$ 2307
Vaginal	0.790	\$ 1431	\$ 1130
Cardiac			
Surgical	6.043	\$ 2640	\$ 15953
Non-Surgical	1.727	\$ 3130	\$ 5405
Surgical	1.793	\$ 1824	\$ 3270
Medical	1.076	\$ 2698	\$ 2903

Within a case mix payment environment, it is critical that the patient categories that are the basis of hospital payment not only predict resource use on average, but also reflect the hospital services used by physicians to diagnose and treat particular patient types. Only then can productivity resulting from changes in technology and practice patterns be monitored.

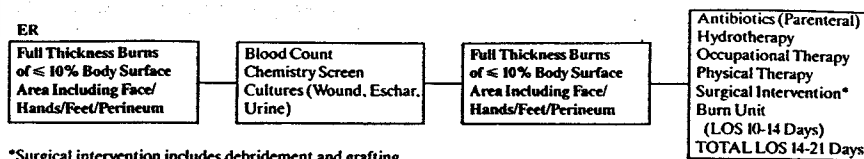
Facility Needs Assessment and Resource Management

Resource management encompasses a wide range of applications in health care. Clinically specific case mix information has been used by governmental agencies, communities, and health funds to manage the health care resources from a regional perspective, while hospital managers have used that same information to allocate resources more efficiently within the hospital. For both regional and hospital-specific applications, it is important to have a comparative standard of resource need, preferably one that is independent of actual use of facilities and services. PMCs are the only patient classification that has such normative standards available that are based on physician expectations for effective care.

Traditionally, facility needs assessment and resource management have been based on an empirical examination of the services actually used by certain patients, without regard to whether that level of care was warranted. For example, one hospital specializing in pediatric and adolescent medicine recently attempted to assess the need and fiscal soundness of adding a special burn unit for children. Initially, hospital planning personnel analyzed historical data on patients less than 18 years of age categorized into burn DRGs who were admitted to hospitals within their service area. The burn DRGs did not accurately identify all burn patients nor did they differentiate the severity of the burn patients identified. In addition, the use of an intensive care unit did not necessarily mean that the patient required special burn care and/or intensive care monitoring.

Exhibit II

Sample Patient Management Path PMC 0505 Burn: Full Thickness \leq 10 Percent with Vital Site



*Surgical intervention includes debridement and grafting.

The same historical data was then examined using PMCs to assess the number of children in the database who had a serious burn – serious enough to warrant the special capability of a burn unit. This was possible because of the existence of the Patient Management Paths which link clinically well-defined patient types to resource needs. A sample Patient Management Path for one burn PMC is shown in *Exhibit II* to illustrate the types of resource requirements specified by physician panels for each PMC. Note that physicians not only specified which patient types require a burn care unit, but they also made explicit a length of stay range for the typical patient in that category.

PMCs identified nearly twice the number of pediatric burn patients in the region than did the DRGs, and, using PMCs, both the clinical staff and the hospital planning personnel were able to differentiate the severity and resource needs of these patients. Burn patients were aggregated by the PMCs that require critical care units (as opposed to only those patients who were admitted to critical care units), and the number of burn care unit bed days required were estimated. Plans to develop a burn unit at this particular hospital were put on hold because of the small number of serious pediatric burns identified.

Quality Assessment

Since 1990, the Spanish Ministry of Health and Consumer Affairs has implemented the PMC system in a number of hospitals as part of a project to develop an initial set of utilization monitoring programs, quality screening criteria, and outcome indicators using routinely collected ICD-9-CM data. In one application, three months of computerized discharge data from six acute care hospitals representing 21407 hospitalized patients were collected, validated and used for all analyses. Quality screens defined by PMCs were ex-

amined overall and, when possible, at the hospital level.

Outcomes examined included the overall rate for potential nosocomial or hospital-acquired infections, the overall surgical complication rate, the inpatient mortality rate (predicted and actual for each hospital), the volume of potential ambulatory patients that were managed on an inpatient basis, and the cesarean delivery rate. The potential nosocomial illness rate ranged from 20 to 45 per 1000 discharges across hospitals (*Exhibit III*). Comparable rates were found in a large regional database of hospitals from another country.

Exhibit IV displays the surgical complications identified by PMCs. As shown, the overall rate of surgical complications was 43.2 per 1000 surgical discharges, with a range of 15 to 43 surgical complications per 1000 for individual hospitals. Such specific results can not be produced using other patient classification systems (like DRGs) since those systems assign patients to only one category per patient.

The model developed by the Spanish Ministry of Health to predict inpatient mortality included three risk factors: case mix complexity, presence or absence of severe complicating factors, and patient age. Predicted rates came within 1.4 percent of actual death rates at the hospital level. Other results included a high volume of potential ambulatory conditions that were found to have been managed on an inpatient basis, and a cesarean delivery rate similar to published rates in Europe but substantially lower than rates in the United States.

Conclusion

The PMC Classification and Relative Intensity Scoring System provides the opportunity to use a single system to examine both clinical and financial systems, within and across hospitals.

In addition, PMCs can be used effectively to monitor hospital performance, to improve the quality of payment systems, and to develop useful indicators of quality. Unlike other patient classifications and severity systems, the clinical framework of PMCs facilitates the integration of all these applications and decreases the fragmentation of the system.

The current availability of PMCs for use with various diagnosis and procedural coding systems used in countries worldwide provides an opportunity to immediately begin to construct and link meaningful clinical and financial databases and analyses. Because of their clinical and financial framework and because they are linked to resource expectations, PMCs can be used in multiple applications to examine performance and productivity of the entire health care delivery system. Furthermore, useful information is provided for clinicians as well as administrative personnel to use in their daily activities and to assist them in establishing policy and direction for the overall health care system.

Exhibit III

- Nosocomial Infection PMCs**
- Urinary Tract Infection**
 PMC 5012 Other Complication: Urinary Tract Infection
 PMC 4217 Urological: Acute Pyelonephritis
 PMC 4218 Urological: Renal/Perinephric Abscess w/Op.
 PMC 4219 Urological: Renal/Perinephric Abscess w/Asp.
 PMC 4220 Urological: Renal/Perinephric Abscess
- Pneumonia**
 PMC 0406 COPD: Pneumonia
 PMC 2401 Respiratory: Bacterial Pneumonia
 PMC 2402 Respiratory: Viral Pneumonia
 PMC 2403 Respiratory: Other Types of Pneumonia
 PMC 2404 Respiratory: Pneumonia w/Effusion/Empyema
 PMC 2405 Respiratory: Pneumonia w/Lung Abscess
- Septicemia**
 PMC 5004 Other Complication: Septicemia
- Surgical Wound Infection**
 PMC 4402 Surgical Complication: Postop. Wound Infection

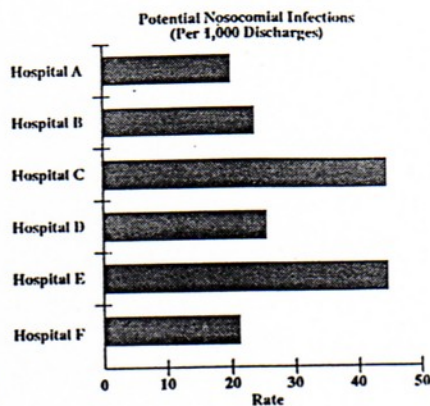


Exhibit IV

- Surgical Complication PMCs**
- PMC 4401 Wound Dehiscence
 PMC 4402 Postop. Wound Infection
 PMC 4403 Postop. Hemorrhage/Hematoma w/Op.
 PMC 4404 Postoperative Hemorrhage/Hematoma w/o Op.
 PMC 4410 Malunion/Non-union
 PMC 4411 Thoracic/Abdominal Hemorrhage
 PMC 4413 Anastomotic Leak
 PMC 4415 Anastomotic Obstruction w/Op.
 PMC 4416 Anastomotic Obstruction w/o Op.
 PMC 4417 Ostomy Malfunction w/Op.
 PMC 4418 Ostomy Malfunction w/o Op.
 PMC 4419 Mech. Comp. of Orthopedic Device w/Op.
 PMC 4420 Mech. Comp. of Orthopedic Device w/o Op.
 PMC 4421 Infections Secondary to Orthopedic Device
 PMC 4422 Dislocation of Intraocular Lens
 PMC 4423 Hemorrhage following Tonsillectomy

