

Trends in Case Management Acuity Determination

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Introduction

The purpose of this article is to examine the concept of case management acuity in the private sector and health insurance industry. In the era of the Affordable Care Act, case management practices across many sectors in the health care system are in a state of flux. In order to understand the context of current practices, a brief review of the various dimensions and definitions related to case management is described. The concept of acuity will be defined and relevant trends in predictive modeling examined. The discussion section will integrate the findings from the literature as well as current and evolving practices in the health insurance sector.

Case Management

Overview

The concept of case management originally evolved in the early 1800's when public health nurses and social workers reached out to vulnerable populations through charitable organizations. Numerous governmental sponsored case management programs emerged after the passage of the Social Security Act of 1932, targeting the elderly, children, the unemployed and the blind. Insurance companies started to incorporate case management strategies after World War II to control the high medical costs of returning soldiers [1]. Since that time, the term has been defined inconsistently and has been "misused as a blanket term for medical management" [1]. Today, there is still no standard definition [2]. Case management definitions and models vary by the setting (e.g. primary care, hospital, insurer), the identified outcomes and the discipline providing the service (e.g. nursing, social work, medicine, or lay-worker).

Most definitions of case management include the various roles that are integral to the process: assessment, planning, linkage, monitoring, advocacy and outreach [3,4]. The Case Management Society of America first published its definition of the concept in 1995. The most recent version defines case management as "a collaborative process which assesses, plans, implements, coordinates, monitors and evaluates the options and services required to meet the client's health and human service needs. It is characterized by advocacy, communication, and resource management and promotes quality and cost-effective interventions and outcomes" [5].

The term case management is often used interchangeably with care management or complex care management. However, Kathol et al. referred to case management and disease management as 2 examples from 7 types of *care management* [6]. The literature generally agrees that there is a distinction between case/care management and utilization management/review [7]. Kathol et al. note that while "there is always some utilization management activity associated with most forms of care management it is not the primary focus of care [case] managers [6]. Utilization managers primarily deal with providers and other service providers vs. helping clients to overcome barriers. They "manage claims" instead of clients on an individual level. Disease management differs from case management according to this source as it focuses on education and prevention of progression for specific diseases. Case managers work with all chronic diseases and other complex medical conditions to improve overall health and prevent complications. Case

managers typically work with the 2-5% of the population who use 30-50% of health care resources [6].

During the past decade, various "types" and "models" of case management have evolved, with none being considered the standard. Indeed there are currently 6 different accrediting agencies for case managers and 21 different certifications related to case management [1]. Descriptive terms such as: "integrated case management"; "partially integrated case management"; "embedded case management" and "relational approach to care management" have added to the confusion. Cesta noted that the earlier traditional model of case management included two silos: utilization review and discharge planning, with each performed by different professionals from different departments [8]. He suggested that there are now three potential case management hospital models: 1. The partially integrated model (a dyad of RN and Social worker roles), 2. The integrated model (all medical and social functions performed by same case manager); and 3. The triad/collaborative model (separate roles or nurse medical manager, social service worker and utilization review manager).

Various role designations and interpretations of the role vary depending on the setting outside the hospital as well. Case management has moved well beyond the hospital borders since the 1960's [1]. It is now performed by large insurers, third party administrators, independent case management companies, community home health and residential programs, to name a few [9]. Thus there may be more than one case manager from more than one sector of the health care system providing 'case management' at any given time. How does the potentially wide range of case-managers coordinate and manage care? Each may have access to different data sources as well as have different definitions of case management and varied outcomes.

Stafford and Berra have suggested that the critical element of success of any case management program is to recognize the system's culture and expectations of outcomes [10]. Thus case managers, who are operating within the culture of an insurer, may need to let go of the fully integrated model which allows managers to assess and assist with biological, psychological, social and health care access issues while maintaining a close personal connection over time with the client [6]. As Stafford and Berra [10] note, clear expectations relevant to the case management program outcomes are essential. Similarly, clear communication and delegation of roles among various case managers acting on behalf of the same client within the health care system are

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required to achieve quality, cost-effective health care.

In the past decade, the literature has identified a new trend in case management, the integration of information technology. These technologies include predictive modeling; evidence-based medicine tracking and electronic medical records [11]. Predictive modeling analyzes data from health insurance claims, health risk assessments, and/or pharmacy utilization to predict risks in the future [12]. Meek identified that the goal of predictive modeling is “to identify at-risk individuals for an undesired outcome for the purpose of intervening with them before the occurrence of adverse events” [13]. It is often used as one of several techniques to identify members of a group who might benefit from case or disease management. The risk score generated from this type of program may also be used to prioritize levels of care.

Evidenced -based medicine tracking refers to the use of large claims’ data sets to compare an individual’s claims with population based trends related to accepted guidelines for care, such as cancer screening behaviors. In the insurance world, most claims’ software and predictive modeling programs also allow for the creation of an electronic medical record based on claims data. These may or may not be linked to the *actual* client medical record at the primary care site. According to a URAC Survey, few information technology systems have a seamless platform accessible to clinicians as well as case managers from the insurer side [12]. The movement toward Accountable Care Organizational Models, as defined in the Affordable Care Act will help to drive the necessary changes needed to link the various players and data involved in case management [13].

Acuity

Given the varying definitions and role expectations associated with case management, it is not surprising that there are also no commonly accepted standards to define and measure acuity of cases. Brennan and Daly published a concept analysis of the term “patient acuity” in an attempt to clarify this confusion [14]. They distinguished between non-patient-related (e.g. sharpness/keen sensation), patient-related, provider-related and systems-related acuity. The identified attributes related to patient-related acuity included onset, time-sensitivity and severity of illness. The provider- related attribute was defined in relation to intensity of health care services required. Three sub-categories were: nursing care needs, workload and complexity. System-related acuity included sub-categories of case-mix, patient classifications systems and urgency/triage scales. Of interest was their statement that the relationship between severity and intensity attributes of acuity may or may not be linear. They concluded that there is a great need for patient acuity scales that are validated and reliable.

Huber and Craig defined acuity as “the severity of illness or client condition that indicates the need for the intensity of the subsequent CM intervention” [3]. They also identified three primary domains related to the concept: client need severity, CM intervention-intensity, and healthcare service delivery responsiveness. They developed the CM Acuity Tool that measures three levels of indicators related to clinical nursing, psychosocial caregivers, quality and cost. In addition they defined “sub drivers” that further help to define the complexity of a case. They used a 4 point ranking scale for these indicators of complexity (1=low; 2=mild; 3=moderate; 4=severe). The scoring for each case allowed the development of a Caseload Matrix score to evaluate and compare complexity/intensity/acuity of caseloads. A second related tool developed by Huber and Craig also allows for an evaluation of acuity change scores over time, which could indicate the impact of a CM program [3,4].

Another acuity tool for case management reported in the literature is the BluCuity Scale, developed for Blue Cross Blue Shield (BCBS) of Massachusetts by the original developers of the previously described CM Acuity Tool. This customized tool assesses three domains: client need/severity; primary and back-up caregiver need/severity; and CM intervention intensity [15]. Prior to the development of this tool, CM nurses at BCBS had to subjectively assess acuity into three rankings: low, medium and high. Once the new acuity tool was implemented, CM nurses had a 5 day period to complete an acuity assessment and determine acuity scores based on member assessments (using phone and other health data). The tool was tested for its reliability and validity in relation to case acuity, caseload acuity and acuity-based decision-making with good results in 2008-2009. It was built into the information technology infrastructure and the electronic medical records system and remains in use today (personal communication, Kathy Craig, 7/6/13).

Three brief qualitative case studies of three agencies that provide care management services will be presented next. The first is a large insurer (Company A) that provides case and disease management services by its own nursing staff. Company B and Company C is both care management/disease management companies that provide services through insurers and directly to corporate clients. As expected, the working definitions and expected outcomes of care/care management differ among the agencies.

Case study A

This company is a large insurer that uses the term “*care* management” for what others call [complex] case management. They distinguish this from disease management, which is where most of their employed nurses are spending their time. The major focus of their care coordination is on post-hospitalization care coordination and prevention of future hospitalizations. Their system generates referrals for evaluation based on high claim costs, hospitalizations for selected diagnoses, physician or member referral. The acuity definitions for both care management and disease management focus on the anticipated “intensity” of nursing interventions required to avoid a future hospitalization vs. the actual level of disease severity or client/caregiver psychosocial needs.

Care management in this company has relatively short term objectives, with approximately half of the care management cases “one [point of care coordination] and done”. There are slight variations depending on some conditions, for example the frequency contact for the various acuity levels differs for high risk pregnancy vs. oncology members vs. members with a list of other selected chronic diseases. The current acuity levels are 1-5 with 1 requiring the highest levels of intervention/acuity (nurse contact once every 1-2 weeks) vs. the lowest level of 5 (nurse contact at 10-12 weeks post discharge for most chronic diseases; or at 3-6 weeks for postpartum cases). They also have a “0” classification for those not yet assigned. A revised 4 point acuity scale is currently underway. Nurses determine the acuity level; it is not automatically generated by any data in the system. The nurses determine the acuity after their initial assessment contact with the member and it can be changed after each contact if they have moved to another level.

Case study B

Similarly, Company B, a national disease management company has a 5 point acuity rating scale that is also determined by the assigned nurse case manager. This is also based on anticipated nurse intensity- but in contrast to Company A, their “1” is the lowest level of nursing contact (every 3-4 weeks) vs. level “5” (telephonic contact every week).

The nurse disease manager also determines the acuity-within 24 hours after meaningful contact and assessment has been completed. Not surprisingly, with the emphasis on disease management, the focus of the program would be different. While hospital prevention is a key goal, education and achieving maximum wellness are also key objectives. This company uses an actual acuity tool that was recommended by a consultant which they also individualized to their program’s needs and objectives. Caseloads are assigned based on nurses’ acuity caseload scores. The acuity score is also reported on a regular basis to clients. Changes in acuity scores are also potentially analyzed for members receiving long term disease management. The scoring remains the same regardless of the diagnosis in this company; each acuity score reflects the standard expected contact times anticipated by the nurse case manager.

Case study C

In contrast to Companies A and B, Company C, a disease management company, uses three levels of acuity which are generated by an automated internal system. The system initially generates an acuity score with 3 levels: 1=high acuity; 2=moderate acuity; and 3=low acuity based on a predictive modeling program that determines the likelihood of inpatient admission and emergency room admission in the next six months to help determine the acuity. The nurses can adjust the acuity score after their assessments and interventions at any point. The high acuity is defined as an assessment call in addition to a minimum of 6 nurse interaction calls. The moderate level entails an assessment call and a minimum of 3 nurse interaction calls. The low acuity score are members with stable chronic conditions with no recent hospitalization who will receive education and monthly monitoring but no minimum calls. They utilize a proprietary analytic system to generate the risk scores based on diagnosis, health care gaps and medication/pharmacy-based data. In contrast to the other disease management company, Company C does not use the acuity score to manage caseload assignments. They also do not use the same acuity scores generally for reporting to their clients. Instead, they report on level of engagement which has different definitions than their internally used acuity score.

Predictive Modeling

The logic in predictive modeling has been used in other CM acuity tools as described in the literature and Case Study A. The *Verisk Health* System is one of several predictive modeling programs available in the market today. A brief summary of each measure of risk identifiable through this program will be described as an exemplar for predictive modeling in order to determine the potential application of predictive modeling in case management.

The Risk Index (RI) is a representation of the frequency of occurrences of certain risk-predictive events based on an individual member’s claims. Values and weights are assigned to selected diagnoses, procedures or drugs. Comorbidities are accounted for in the scoring system as well as disease specific criteria and treatment patterns. The Adjusted Risk Index (ARI) adjusts for treatment gaps and possible noncompliance. If the ARI is close to the RI then it reflects that the clinical treatment is adequate and the member is compliant. Both Risk Indexes identify those members who will incur significant medical costs and have a high level of clinical risk. The recommended values for risk ranges in the RI and ARI “bucket” are noted in Table 1.

The Care Gap Index (CGI) is analytic measurement incorporates the differences between the Risk Index and the Adjusted Risk Index. It is a more concrete evaluation of the members who are most out of

	RI Values	ARI Values	CGI Values
Low Risk	<or = 8	<or = 8	<or = 3
Medium Risk	9-20	9-20	4-5
High Risk	>20	>20	>5

Table 1: Comparison of Values for Risk Assignment for RI, ARI and CGI.

sync with good medical care and compliance. It is recommended to be used as a clinical triggering mechanism to identify those who are most likely to improve with interventions. Thus a member may have a high RI and thus high cost claims are expected, however if the CGI is low, then it means that intervention may not make a difference, the member is getting adequate care. Table 1 also notes the numerical values assigned to the CGI. Of note, there are different ranges with the CGI in comparison to the RI and ARI.

The Relative Risk Score is another analytic tool available through the *Verisk Health* system. This concept is based on diagnoses. It predicts future (12 months) claims costs based on an insurer’s or company’s book of business or *Verisk* national norms data. This helps to explain resource use and population-based clinical outcomes vs. individual clinical outcomes (covered by RI, ARI and CGI). The norm is the number 1. So if one has diabetes and has a RRS of 1, then his/her costs are predicted to be on par with the average person with diabetes. The number cannot be less than 0 but can be a zero or decimal point which suggests less than average future predicted costs. Thus a RRS of 2 would mean that the costs are predicted to be twice as high as the average person with that diagnosis. The analytic process adjusts for more than one diagnosis as well. The database also generates projected costs for next 12 months which can be documented and then compared to actual costs 12 months later to demonstrate return on investment from case management in some cases.

Discussion

Case management acuity is defined and used quite differently within the reported literature as well as in the three reported case study examples. Not surprisingly, the goals of case management also differ in various sectors of the health care system thus accounting for some of these differences. But even within similar segments of the health system, variation has flourished and continues to do so at this time.

Numerous challenges have impeded the standardization of how the concepts of case management and acuity are operationalized in the health insurance industry. With the Accountable Care Organization “train” approaching the system, the impact on case management at various intersections of health care case management remains unknown. In addition, the impact of evolving technology remains unclear. While some systems have already automated the generation of an acuity score, others have stayed with an original nurse designation. While some companies are currently using acuity scores for managing caseloads and assigning new cases, others are not there yet. The potential use of predictive risk modeling for case management case identification and acuity designation has not yet been realized. Various proprietary programs have their own unique formulas and definition of risk which precludes industry-wide standardization of risk.

Cesta reminds us that a major objective of case management should be to reduce and prevent future hospitalizations, regardless of where this service is provided (hospital, insurer, case management company etc.) or who provides it [6]. His review of the literature revealed 4 top reasons for hospital readmissions: not seeing the physician within ten days of initial discharge; not adhering to medication recommendations;

lack of knowledge about disease management; and lack of home care post discharge. These are all potentially impacted by case management interventions and they are all potentially identified by the concept of the Care Gap Index as defined by *Verisk Health*.

With the focus on reducing hospitalizations and high claim costs from the insurer perspective, case managers from this sector need to focus on the deliverables. Acuity needs to be defined and parameters set to capture the minimum levels of intervention while meeting measurable objectives. As Kathol, Perez and Cohen state in *The Integrated Case Management Manual* (2010), “identified complexity [acuity] immediately translates into actionable steps mutually taken by the case manager and patient to improve health” [6].

There is no consensus on the determination of case complexity/acuity/intensity. Larger, more complex companies have reported in the literature the utilization of many facets of the term acuity to determine a score. However, the focus on *nursing intervention levels* as the key factor in determining acuity seems to be a common thread in many case management programs. However the measure of the level of nursing intervention varied by nursing hours, number of contacts, and number of calls. It appears evident from the literature and the cases reviewed that “buy-in” from the case managers themselves and a nimble program that can allow for changes over time is critical. It has not been validated whether three vs. four or five levels of acuity are more appropriate; this review suggested that 4-5 levels are more common.

The focus of case managers from the insurer side should be the reduction of claims costs and particularly, the prevention of re-hospitalization. The numbers alone suggest that there are constraints in terms of nursing staffing to handle all high cost cases and/or all members with high Care Gap Index levels. Those determined to be actionable and have a return on investment should remain the focus of case management from the insurer’s perspective. The measure of acuity of CM cases needs to have buy-in from the ground up in the organization. The most simple and clearly defined acuity definition based on minimum contacts may be more easily integrated vs. determining the anticipated number of contact hours. Using a 4 or 5 point acuity scale may also be more helpful than a three level model so that the contact frequency can be clearly delineated.

Conclusion and Recommendations

Although the literature has revealed one reported reliable CM acuity tool, there are no standardized, consistent measures of CM acuity. The tool that has been validated in the literature would require extensive time, training and capital investment in order to integrate it into a new system. Any new acuity rating scale needs to be nimble enough to be easily integrated within the current operating framework which may include a risk assessment database as well as claims and nursing tracking program.

In summary, based on this review, there are no set guidelines for all CM settings in relation to acuity and levels of intervention. Thus each CM site needs to develop clear goals and objectives in order to determine best practices. Two predictive modeling concepts, the Care Gap Index and Relative Risk are promising tools to automate referrals to

case management and potentially to identify acuity. Case management objectives in the insurance industry cannot be all inclusive of all the holistic goals based in primary care CM programs. The focus of case management by the insurer needs to be related to prevention of hospitalization by reducing care gaps and promoting compliance with best health care practices.

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