

Clinician Considerations When Selecting High-Risk Patients for Care Management

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Healthcare delivery systems are increasingly entering into risk contracts which require healthcare providers to manage the utilization of defined patient populations. Care management programs (CMPs), particularly those based in primary care practices, have become a common strategy to meet the cost containment and quality targets in these contracts. Due to the concentration of costs in persons with multiple chronic conditions, these persons are often selected for care management interventions that aim to enhance the coordination of health services and improve patients' ability to navigate the health system.¹⁻⁴ Appropriate case finding, or the identification of patients most likely to benefit from care management, is key to maximizing the cost-effectiveness and sustainability of CMPs.^{4,5}

Many CMPs rely on quantitative approaches to high-risk patient identification, such as risk prediction models based on prior healthcare utilization and clinical conditions. These approaches typically rely on administrative data, such as billing claims, to predict future healthcare utilization, but are often unable to include more nuanced patient characteristics, including socioeconomic and psychosocial circumstances.⁶⁻⁸ Claims-based approaches often fall short of identifying the patients who are most likely to engage in and benefit from care management because they are unable to detect factors such as patient willingness to participate or barriers to participation.⁹ Moreover, use of data-driven algorithms often introduces a time lag between when patients need help and when they are identified for the program.¹⁰

An alternative strategy is to rely on direct referrals from primary care physicians (PCPs) to identify appropriate patients. This strategy is based on the premise that PCPs know their patients best and can consider patient characteristics not routinely available in administrative data or medical records.^{6,10} However, PCPs vary widely in their referral patterns for such programs,¹¹⁻¹⁶ and concerns have been raised about underselection of patients with poor existing linkages

ABSTRACT

Objectives: Hybrid approaches to case finding show promise as a method to increase the success of care management programs (CMPs). A large healthcare system implemented a hybrid approach in which clinicians review algorithm-generated lists of potential high-risk patients within their practice and select the patients most appropriate for the CMP. We sought to understand the criteria clinicians used when selecting patients.

Study Design: We conducted 20 semi-structured interviews with a convenience sample of primary care clinicians and their care managers from a diverse set of practices.

Methods: Two independent reviewers thematically coded interview responses through an iterative process.

Results: In addition to clinical need (eg, disease severity or multiple comorbidities), interviewees considered a number of non-clinical patient characteristics that they felt placed patients at risk for suboptimal healthcare utilization and poor adherence. These include patients' predisposing (eg, health literacy or navigation challenges, physical vulnerabilities, insight regarding their health) and enabling characteristics (eg, social and home environment, coping skills, financial resources). Interviewees also considered patients' existing linkages with the health system and whether other clinicians were already meeting a patient's care needs.

Conclusions: In selecting patients for a CMP, clinicians considered patient characteristics that are not easily captured in standard clinical and administrative data. A hybrid approach to case finding concentrates clinician review on patients who meet standard clinical and healthcare utilization criteria, and allows clinicians to incorporate knowledge of patients' predisposing and enabling characteristics that are not readily maintained in clinical data.

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with the healthcare system.^{9,16} Finally, physicians with a poor understanding of care management goals or approaches may refer inappropriate patients to these programs.

Hybrid approaches that combine predictive modeling and clinician input have been suggested as a way to overcome the biases and limitations of the individual approaches.^{10,15} Prior research has explored the extent to which primary care clinician case finding agrees with predictive modeling case finding,^{10,17} but has not examined the added benefit of clinical review of a list of potentially high-risk patients generated from a predictive algorithm. We investigated the contribution of clinician input in the selection of high-risk patients within an active primary care-based CMP using semi-structured interviews of PCPs and their nurse care managers (CM). We were particularly interested in the criteria and patient factors clinicians used in practice when determining which potential high-risk patients within their panel should be targeted for care management. Specifically, we examined the extent to which clinicians considered: 1) patient characteristics that are and are not routinely available in clinical and billing data; and 2) existing patient linkages to other providers within the healthcare system when reviewing lists of potential high-risk patients, and identifying patients appropriate for practice-based care management. We hypothesized that clinician involvement enhanced the case selection process by allowing the inclusion of information about the patients not readily available in administrative data.

METHODS

Description of Care Management Program and Patient Selection

The CMP is a primary care-based, nurse-led longitudinal care program designed to help high-risk patients (ie, chronically ill, medically complex patients) better manage their health and healthcare utilization. Approximately 400,000 Medicare and commercially insured patients 18 years or older were eligible for the CMP in 2013. CMP patient selection starts with the use of a billing claims-based predictive algorithm to identify an initial list of high-risk patients. As a first step, chronic conditions, utilization patterns and a predictive risk score for future total medical expense are generated using the prior year of paid claims using Optum ImpactPro version 6.0 software (Optum Inc, Eden Prairie, Minnesota). Combinations of specific chronic conditions and patterns of healthcare

Take-Away Points

This study identified the factors that primary care clinicians and care managers considered as they reviewed algorithm-generated patient lists to identify a final set of patients appropriate for care management.

- In addition to the complexity of patients' medical conditions, clinicians considered patients' health literacy, physical vulnerabilities, social and home environment, and coping skills when selecting patients for care management.
- Clinicians also considered the extent to which patients' care needs were met by strong existing linkages to care providers outside of the primary care practice.

utilization, as well as overall risk score, are then used to identify the initial set of high-risk patients using an algorithm developed with input from an advisory committee of operational and clinical experts within the healthcare organization. Approximately 5% of patients are identified as potentially high risk based on the claims-based algorithm. These patients are then sorted into PCP-specific lists for clinical review. Lists provided to PCPs included the chronic conditions, utilization, and predictive risk score for each patient, as well as patient name and medical number so clinicians could easily recognize their patients. Each PCP, together with their CM, was responsible for reviewing between 1 and 39 potentially high-risk patients for 2 insurance-risk contracts in 2013, the second year of the program. Overall, clinicians selected approximately 61% of patients on the algorithm-generated list for the CMP. Clinicians were asked to classify patients on their list according to whether they were appropriate for the CMP, or they were not appropriate either because they were not considered high-risk or because the patient's care needs were already being met. PCPs were given considerable latitude in how they classified and selected their patients for the CMP.

Study Design

Using semi-structured interviews of PCP and CM dyads, we elicited and analyzed the patient characteristics that clinicians considered when selecting patients for CMP. This project was undertaken as a quality improvement initiative, and as such, was not formally supervised by Partners Healthcare's Institutional Review Board per their policies.

Participants

We identified a convenience sample of 20 PCP and CM dyads from 18 ambulatory practices within an integrated healthcare system consisting of 270 primary care practices located in eastern Massachusetts. Physician organization leaders identified participants with the intention of maximizing variation in practice characteristics, such as the level of affiliation with the delivery system, location, and

Table 1. Practice Characteristics of Interviewed Primary Care Physician and Nurse Care Managers (N = 20)

Practice Variables	N	%
Practice affiliation		
Academic medical center (AMC)	6	30
Non-AMC hospital system	10	50
Community practice	4	20
Practice location		
Community	14	70
Hospital	5	25
Community health center	1	5
Practice type		
Primary care only	17	85
Multi-specialty	3	15
Practice model		
Owned by health system	12	60
Affiliated with health system	8	40

type (Table 1). The CMP director then confirmed willingness to participate.

Data Collection

A physician researcher (CH) and project manager (VH) conducted all interviews, either by phone or in person, at the respective practices. Interviews lasted 45 to 60 minutes and were audio recorded with consent from all participants. All interviews were completed between May and September 2013. A research assistant (LM) transcribed the audiotapes verbatim.

Interviews followed a semi-structured, open-ended interview guide developed through an iterative process by the research team, and designed to obtain general programmatic quality improvement information, as well as information on the characteristics of patients selected for care management. Relevant interview questions included (see the eAppendix [available at www.ajmc.com] for the complete interview guide): 1) “How do you define a ‘high-risk’ patient and what criteria do you use to determine if a patient is ‘high-risk?’” 2) “What types of patients did you remove because they were ‘not high-risk?’” 3) “What types of patients did you remove because they have their care needs met elsewhere?”

Data Analysis

The Andersen Model of Health Services Utilization¹⁸ provided a basic framework for organizing interview responses according to whether they reflected patient predisposition to use services (predisposing factors), char-

acteristics that enable or impede health-care use (enabling factors), and patient need for healthcare (need). We coded and analyzed interview responses using QSR International’s software, NVivo version 9, a qualitative data management and analysis software tool (QSR International Pty Ltd, Doncaster, Australia). In the first level of analysis, an interviewer and a research assistant (VH and LM) independently read and thematically coded all interview transcripts—a process that allows coders to organize and evaluate similar quotations by themes.¹⁹ Through an iterative process, content-related minor themes or factors were collapsed into major factors, then minor and major factors were discussed until a mutual agreement was reached. We met with clinician researchers and operational leaders to solicit feedback, present disconfirming evidence, and validate the coding scheme.²⁰ After coding the data into this framework, we retained and summarized the major and minor predisposing, enabling, and need factors mentioned in at least 20% of interviews. Exploratory analyses examined variations in themes by practice affiliation and model.

RESULTS

Although limited to a single large integrated delivery system, our convenience sample of interviewed practices represents a broad range of practice affiliations, locations, and models (Table 1). The major and minor factors that PCPs and CMs considered in deciding which patients would be appropriate for care management within their primary care practice are summarized in Table 2 and exemplary quotations are provided in Table 3.

Patient Predisposing Factors

Health literacy and navigation. Most interviewees (85%) considered a patient’s ability to comprehend medical instructions and navigate the healthcare system when determining whether patients were appropriate for the CMP. Specifically, more than half (55%) of interviewed PCPs and CMs reported that they considered patient need for education about their diseases and appropriate management as they selected high-risk patients. Almost half of interviewees suggested that activated patients (ie, patients who are good “advocates for themselves,” “well-versed and knowledgeable about what they need,” and “can take care

of themselves”) may not benefit from the additional resources provided by care management. On the other hand, interviewees felt that patients with linguistic or cultural barriers, as well as individuals with impaired executive function, would be more likely to benefit from the services rendered by CMs.

Physical vulnerability. More than half (60%) of interviewees considered whether their patients had physical vulnerabilities, including a high risk of falling, frailty, or advanced age, when determining appropriateness for CMP. Clinicians reported that, in some cases, they would select patients with relatively stable functional status if they had physical vulnerabilities because they felt care management might help facilitate patient care in the event of decompensation.

Patient insight regarding his/her health. Just over half (55%) of interviewees considered the extent to which patients accurately perceived their health status and their need for assistance. This included elderly patients who were reluctant to lose their independence, younger patients in denial of their medical conditions, or patients who minimize their health needs. Interviewees felt these types of patients lacked an accurate perception of their limitations and needs, potentially leading them to refuse certain types of medical care or assistance. Interviewees stated that they would include these patients in the program, but that it might be challenging to engage and impact these types of patients.

Patient Enabling Factors

Social/home environment. All interviews mentioned that they considered their patients’ social and home environment when assessing appropriateness for the CMP. Interviewees observed that relatives often serve as patients’ advocates and caretakers, helping patients navigate the health system, monitoring medication regimens, and noting changes in the patient’s health status. A large majority (90%) of interviews considered the absence of patients’ familial and social supports as reasons to include patients in the CMP. Instability in a patient’s home environment was mentioned as a consideration in a large majority (75%) of interviews, with issues ranging from addiction and verbal

abuse to hoarding, as well as spousal illness, hospitalization, or recent death. Some (30%) interviewees mentioned the social isolation of living alone as an added risk factor for elderly and frail chronically ill patients. Finally, lack of access to transportation, home delivery of food, or other community resources were also considerations for CMP inclusion (30%).

Coping skills/health anxiety. Over half (65%) of interviewees noted that they would select patients with underlying mild psychological concerns, such as health anxiety, who often seek reassurance from medical professionals, whether through frequent phone calls or urgent care visits. Such patients may benefit from a CM, who could act as a point-person to help them manage anxiety related to their medical conditions without consuming limited office resources.

Financial resources. A minority (35%) of interviewees mentioned socioeconomic instability (ie, chronic unemployment or unstable housing), and its effect on a patient’s ability to manage his or her chronic illness(es). Medica-

■ **Table 2. Patient Factors Considered by Clinicians When Case Finding for Care Management (N = 20)**

Factors	N	%
Predisposing factors		
Health literacy/navigation	17	85
Knowledge of disease and appropriate management	11	55
Health system navigation	5	25
Self-efficacy	9	45
Physical vulnerability		
Age as risk	10	50
Risk of falling	4	20
Frailty	5	25
Patient insight regarding his/her health	11	55
Patient enabling factors		
Social/home environment	20	100
Availability of social support	18	90
Stability and quality of family/home environment	15	75
Living alone	6	30
Access to community resources	6	30
Coping skills/health anxiety	13	65
Financial resources	7	35
Need factors		
Disease characteristics	20	100
Diagnoses	18	90
Complexity/multiple chronic conditions	18	90
Disease severity	7	35
Control of disease	13	65

Table 3. Examples of Clinical Case-Finding Themes and Quotations

Sub-Themes	Supporting Quotation
Health literacy/navigation	"People are trying to find their way through the complexities of social services or ancillary medical services. How do I get durable medical equipment? How do I get the wheelchair paid for by these people? That sort of navigation of those services."
Physical vulnerability	"It's the patients that teeter. The elderly in particular when they start losing independence and need more support. Those are the ones that we can impact the most."
Patient insight regarding his/her health	"Folks who continuously put themselves in high-risk settings and we all know it. And there is usually some mental health issue, but also elderly folks trying to preserve their independence when by all objective indicators it's no longer working."
Social/home environment	"I think one of the biggest factors that comes to my mind on how we can make a difference are these people that are isolated. They don't have the supports at home. They don't have daughters or sons looking over them, their medication lists and their pill bottles and things like that. That's when people really fall apart. When they are alone."
Coping/health anxiety	"My impression is that a lot of people that end up on this list it's very much anxiety driven. That they literally, as a way to soothe their anxiety, they go to multiple appointments and multiple ED visits. If I just go to another doctor, I'll get an answer."
Financial resources	"They stop meds because they can't afford them."
Disease characteristics	"What I learned over time is that they become unstable and that eventually one of those diagnoses drives it, whether it's cancer, CHF, something worsens over time and...they really should be on this list."

CHF indicates chronic heart failure; ED, emergency department.

tion adherence issues related to financial instability were also considered.

Need Characteristics

Disease characteristics. All interviewees considered their patients' chronic conditions, including the severity or stage of the patient's disease, and the patient's complexity or combination of conditions. Interviewees considered whether complicated medication regimens placed their patients at higher risk for decline, complications, and hospitalization. Interviewees specifically highlighted patients with co-occurring medical and psychiatric disorders, such as depression, which they felt further complicated patient care and the patient's ability to manage his or her medical condition(s).

Additional Considerations

In identifying patients appropriate for CMP, interviewees considered factors in isolation, but also described the interplay between patient factors, and how the combination of these factors either supported or impeded a patient's ability to effectively manage his or her health.

Once clinicians determined whether patients were high-risk, interviewees then considered whether the CMP would be the right program for the patient. Interviewees considered whether the patient was already connected with other clinicians, and if the resources available through the CMP would address the patient's needs. Spe-

cifically, they reported considering existing relationships with specialist physicians (eg, psychiatrists, cardiologists) or specialty clinics (eg, transplant, oncology), private CMs, or institutional care providers (eg, group homes, assisted living). Decisions regarding whether care needs were met relied on clinicians' perceptions of whether there were additional resources or services the CMP could provide, such as transitions to end-of-life care. Moreover, interviewees' understanding of the CMP also impacted their decisions about whether to include certain subgroups of patients. For instance, some interviewees excluded patients whose primary diagnosis was a psychiatric condition or substance abuse because they felt the CMP did not yet have the resources to meet these patients' needs.

DISCUSSION

Our study evaluated the factors clinicians considered important in determining whether potentially high-risk patients within their practice would benefit from a practice-based CMP. Similar to others, we found that clinicians consider patients' predisposing factors, including health literacy and patient self-efficacy, as well as enabling factors, such as home and family supports, when identifying patients appropriate for care management.^{17,21-25} We found that these factors remained important, even in our hybrid approach to case finding, in which clinician deci-

sion making is limited to a set of risk contract patients with prior high-cost care patterns and complex chronic illness. Additionally, clinicians in our investigation considered whether existing medical and community resources were already addressing patient needs and whether CMP would enhance or interfere with existing patient care networks.

Many of the factors clinicians considered in their decision making are not routinely captured in clinical or billing data, and are therefore unavailable for case finding.^{7,26} For example, patient home environment and social support, as well as patient health literacy, were factors considered by a large majority of clinicians when identifying patients appropriate for CMP. This information is not contained in billing records and is not routinely captured in electronic health records.

Previous research found only a small subgroup of patients concordantly selected by PCPs and predictive modeling for care management.⁶ Compared with PCP-based case selection, a predictive modeling approach tends to identify patients who are at a higher risk of healthcare utilization and have a higher morbidity burden,⁶ but are less likely to be helped by care management, either because their utilization is not preventable or they are unwilling or unable to participate.⁹

The hybrid approach in this study builds on these findings. Starting with a predictive model to identify a subset of patients that may be appropriate for CMP effectively limits the review burden on clinicians, and focuses the clinical review on the subset of patients who are enrolled in a risk contract and have chronic conditions and patterns of prior healthcare utilization that may be amenable to care management.

More systematic capture of clinical and demographic data may become standard in newer electronic medical records or health information exchanges,²⁷ but many of the nonclinical, nuanced factors clinicians reported considering are unlikely to become standard elements of clinical documentation, either because of privacy concerns or because of their limited relevance to standard clinical care.

Incorporating clinical input in patient selection addresses some of the limitations associated with the use of claims or medical record-based algorithms for case finding, but might also introduce new biases. Physicians and practices may vary in their threshold for CMP referral or how they weigh specific criteria. For example, some practices may have existing programs or supports, such as special programs for patients with heart failure or diabetes, or close ties with cancer centers that might impact their patient selection. Variations in decision making may also

be related to differences in knowledge or acceptance of team approaches to patient care. For instance, we found that some clinicians were unsure whether the CMP would have the necessary resources for patients with co-occurring mental health and substance use. More training and education as to the types of patients who would be a good fit for CMP may improve the patient selection process.

Limitations

The present study had several limitations. First, it relied on a convenience sample of PCPs and CMs who were identified by physician organization leadership, and may overrepresent clinicians who were already familiar with and engaged in the program. Second, this investigation was a quality improvement activity primarily meant to identify the training and education needs of clinicians in the system in order to improve the patient selection process in subsequent years. A more rigorous and multi-site study design would be optimal to yield more generalizable findings and determine the costs and benefits of clinician review of algorithm-generated patient lists. Further investigation should also examine the types of patients for whom the CMP had the most impact, both to target the program to those patients and to explore the need for other models to support patient needs. Future work could also examine outcomes for patients removed by clinicians within hybrid selection models.

In addition, we could not determine which factors were relatively more or less important considerations when identifying appropriate patients. For example, interviewees did not remove all patients with existing linkages to specialty clinicians. Further investigation is warranted to better understand how PCPs' conceptualize the role of CMP for patients with strong existing linkages within the healthcare system, such as facilitating care coordination, transitions in care, or access to community resources.

CONCLUSIONS

A critical first step to using care management to improve healthcare value and efficiency is the identification of appropriate patients. The present study found that primary care physicians and nurse CMs take many patient characteristics and factors not readily available in electronic clinical documentation or billing systems into account when identifying the set of patients within their panel who are appropriate for care management. Clinicians use their personal knowledge of their patients' cognitive, physical, emotional, and social supports and barriers, in addition to their patients' healthcare needs to

identify patients appropriate for CMP. Finally, clinicians considered whether the CMP would complement or complicate their patient's existing linkages with the healthcare system. The factors considered by PCPs and CMs within a single large integrated delivery system may be of value to other systems seeking to use a similar approach to identify patients for practice-based care management.

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eAppendix

Structured Interview Guide

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Introduction: (5 min.)

We are meeting with between 10 and 20 PCHI practices to review the year one experience with the high-risk care management program – iCMP. We chose two of the practices from each of the regional service organization (RSOs). We, as interviewers, are not privy to how they went about selecting the practices, but we do know that they selected practices that had a relatively large representation of high-risk commercial patients (over 30) and then selected randomly from those sites with a few exceptions. We believe the groups that we are interviewing are representative of the program.

Specifically, through these interviews, we hope to identify ways to improve training and education materials use to facilitate high-risk patient selection and engagement and understand issues with and potential remedies to the current care model.

This interview should last between 45-60 minutes. There are no right or wrong answers to these questions, so please respond as honestly as you can.

If it's OK, we would like to audio-record our conversation just to make sure we don't miss anything. Is this ok with you? (If Yes: Turn recorder on; If No: Take notes instead)

I. Patient List Review Process

Let's start with an overview of the clinical review process used at your site to determine which patients are appropriate for the care management program and the approach you take to engaging these patients. As you know, Partners has outlined a multi-step process that affiliated practices can use to enroll patients in the care management program or iCMP. We'd like to learn today how your practice: 1) identifies patients who are appropriate for the care management program (after administrative review to remove patients who are no longer with the practice, deceased or in hospice or custodial care), 2) removes patients that do not meet the definition of high-risk or have their care coordination needs met elsewhere and 3) reaches out to enroll these patients in the iCMP.

Clinical review process: (8-10 min)

1. Please describe the process used to clinically review and assign status codes to patients at this practice. What is the step-by-step process for the clinical review in your practice?
 - a. Who is involved in the clinical review of high-risk / iCMP patient lists for the purposes of identifying patients appropriate for care management?
 - i. Probe: PCP? Care manager? Administrative personnel? Other clinical personnel? Practice management team? Other?
 - b. Who makes the final decision about which patients are eligible?
 - i. Probe: The care manager? The PCP? Both? Other?
 - ii. Probe: What happens when the review team disagrees?

- iii. Probe: Is there a final review of the lists? (e.g. at the RSO level?) If so, what is the purpose of the review?
 - c. Does the care manager perform a preliminary review of patients? If so, how does the PCP / final review team use the care managers' assessment?
 - i. Probe: Always accepts the care manager's opinions? Sometimes (under what circumstances)?
 - d. Are there any special groups of patients (e.g. Medicare vs commercial insurance) that you handle in a different or separate way in assessing their eligibility for the care management program? If so, how do the procedures for these patients differ from your usual procedures?
- 2. What information do you use to help you decide which patients could benefit from the care management program?
 - a. Probe: Do you rely on your memory of the patient?
 - b. Probe: Do you review the patient's chart / medical record?

Defining high-risk / understanding removals for “Not high-risk”: (10 min)

- 1. How do you define a “high-risk” patient?
- 2. What criteria do you use to determine if patient is “high-risk” or not?
 - a. Probe: The patient's home / family situation or resources / supports?
 - b. Probe: The patient has specific diagnoses?
 - i. Which diagnoses?
 - c. Probe: Cognitive / literacy / education issues
 - d. Probe: The patient does / does not have a long-term care management need.
 - e. Probe: How do thoughts on whether patients are “impactable” contribute to decisions on whether a patient is complex or not? If so, what does it mean to be impactable?
 - i. Probe: Patient characteristics or diagnoses reduce the likelihood of impact?
 - ii. Probe: Do not have the right resources available to “impact” the patient's condition.
 - f. Other?
- 3. If not yet clear: Who did you remove because they were “not high-risk”

Care needs met elsewhere: (5-10 min)

- 1. What types of patients have their care needs met elsewhere?
 - a. Probe: Are there particular condition types? Severity? Stage of diagnosis?
- 2. Where are these patients' care coordination needs met?
- 3. How do you know the patient's care needs are being met?
- 4. How would you or your practice know if the patient's care needs were no longer met by another provider / entity?