Patient segmentation

Many practices have worked long and hard to improve chronic care. Most take the approach of working on a single clinical entity, often using the well-researched framework of the Care Model (www.improvingchroniccare.org). We've found anecdotally that it is difficult for most practices to scale up the work of disease specific chronic care improvement beyond one or two diseases. Practices find themselves struggling to keep up with the work of data entry required to track important metrics and without payment reform or subsidy, find it difficult to maintain this uncompensated work.

Searching for a means to work with all of the patients in a practice – scalable chronic and preventive care – we're testing the concept of "planned care for all."

We start by surveying all patients using HYH. From HYH we can segment patients in to low, medium, and high needs. The key discerning variables that spell the difference between good outcomes and bad and the movement from one to the other are pain, emotions, adequate finances, and self confidence (see other documents for the rationale and validity of these as key indicators).

Patient With	Planned Work
Relatively Few Needs	Screen for Status Very Good Information Unfettered Access Reminder System
Moderate Needs	Above Group Visits Online Community
High Needs	Above Collaborative Goal Setting Telephone Coach Problem-Solving Face-to-Face Problem-Solving

Low needs patients

Regardless of diagnoses, these patients are doing pretty well. Should they ever have a need to engage with us they need immediate and unfettered access, high continuity and reliable practice, and very good information so that they may make appropriate adjustments in their care.
Using a tickler system we remind this cohort to re-screen once a year or every other year so that we can be sure they remain low needs.

Medium needs patients

These patients are not doing quite so well -not achieving key goals with consistency. In addition to the basic services noted under Low needs, many of these patients benefit from extra intervention.

A logical sequence of interventions is as follows:

1: Assess the patient's conviction that they engage in work that might close this particular gap in their care/outcomes. If the patient is not convinced, they may benefit from interventions based on Motivating Healthy Habits (www.motivatehealthyhabits.com) or Stages of Change type interventions (http://www.aafp.org/afp/20000301/1409.html).

2: Once a patient is convinced that the work is important to them and they continue to have difficulty achieving the desired outcome, they may benefit from collaborative action planning, problem solving, and/or telephone coaching (all components of the confidence coaching tool in the toolchest). Some patients may do this on their own, some may benefit from doing this in the office with assistance from one of the office staff trained in collaborative action planning.

3: If the patient has tried and failed to follow through on the collaborative action plan and/or continues to fall below the desired outcome, the practice can offer problem solving support. The practice may direct patients to first try the on line version as part of HYH (http://www.howsyourhealth.org/cgi-bin/pblmslv.py). If this does not work for the patient, the practice may offer the patient a telephone problem-solving coach ("Cool tools" pages 17-20).

High needs patients

For these patients we ramp up the frequency and depth of interaction for all of the above as well as consider consultation/support from other sources.

Group visits may be a benefit to patients in medium or high needs categories. (See the link in the toolchest)

Segmentation questions:

There are five patient variables differentiating need as well as three practice variables that address population risk. All of the answers are from the patient perspective through the use of HowsYourHealth.

Patient variables
Pain, Emotions, Finances, Information, Confidence

Practice risk factors
Access, Efficiency, Continuity

High, medium, and low needs patients are identified through the patient variables. At this point we use a subjective assessment. Low needs patients have none of the significant risk factors. Medium needs patients have some, high needs have many.

Risk to the patient population is identified through the practice risk factors. High risk would be poor access, efficiency and continuity; low risk is patient report of excellent access, efficiency and continuity; and medium needs somewhere in the middle.

Good access, efficiency and continuity are highly correlated to key patient outcomes (emergency room use, hospitalization, blood pressure/sugar control, missed days from work, etc).

The challenges to resource planning are described here.

Common Barriers to Effective Resource Planning

- It is neither necessary nor possible to provide all things to all patients. But it is possible to plan the delivery of the most effective management strategies to the most appropriate group of patients.
- *A disease-specific focus.* A disease-specific focus is usually either very expensive or counterproductive because (i) patients usually have more than one disease and each "disease cycle" requires resources and (ii) the "disease" chosen by the "educator" may not be the problem that matters to the patient.
- A failure to take advantage of high-leverage "commonalities" across most patients and conditions. Strategies A, B, and C stress the commonalities.
- Relevant to the theme of this series is the failure of practices to adopt technology or proven approaches (techne) that are more efficient and effective than the usual care. For example, patients can use the publicly available www.howsyourhealth.org to receive information tailored to their needs, send the information to their doctor, and enter the information into a registry for the office without requiring office staff data entry. A generic problem-solving approach derived from the results of a controlled trial is also available at the Web site (Ahles et al., 2006).
- A failure to recognize that the most highly trained professionals (physicians and registered nurses) are often the least cost-effective providers of the strategies for 80% of the patients. Higher training is usually needed most to individualize care for the 20% of patients who "do not fit" the preplanned strategies.
- A failure of leadership to push for implementation of a more generic, planned, step care management strategy as a way to reduce waste resulting from current ineffective or redundant approaches. The staff must continuously remove waste and rework as they resource plan services to meet their patients' needs (Wasson et al., 2003; Wenger et al., 2003).
- *Failure to start small but plan large.* Resource planning needs to be introduced carefully to patients and the staff because it usually requires them to adapt to changes in roles and processes. Yet, careful introduction should not be an excuse to advance so slowly that the efficiency of planning for 80% of the care is not realized. Progress should be planned. For example, using a patient registry or a checklist at the time of vital signs, a practice might start with patients aged 50–69 having 3 or more conditions. After the practice has used planned-care management strategies for these patients over a 3–6-month period, it should plan expansion to patients of different ages or patients with one or more conditions.

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Resource Planning for Patient-centered, Collaborative Care

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Abstract: In this article, we use self-reported information from 13,271 older adults and the results from several controlled trials to construct a planned-care management strategy that cuts across diseases and conditions and also addresses health disparities attributed to low socioeconomic status. Three strata result from the interaction of patients' financial status, the presence or absence of bothersome pain and psychosocial problems, and their confidence with self-care. A majority of ambulatory patients generally fall in the first stratum. More resources are required in the 2 remaining strata to attain patient-centered, collaborative care. Because the planned-care management strategy is behaviorally sophisticated, it is likely to be more efficient and effective than strategies based on concepts of disease management that focus on either a single disease or groupings of patients who are "high utilizers" of healthcare. We conclude that modern technologies and related approaches make resource planning for patient-centered, collaborative care feasible and desirable. **Key words:** *collaborative care*, *disease management*, *health assessment*, *patient-centered*, *quality of care*, *self-management*

RESOURCE PLANNING builds from the body of knowledge in industry known as production planning or repetitive master scheduling. Resource planning is based on the fact that health systems tend to do certain types of work regularly and predictably. Frontline health workers are frequently in a reactive rather than a planned mode of operation based on knowledge of the patient needs. Resource planning stresses that it is much better for the patient to receive care that is planned: "if it is scheduled, it will happen; if it is not planned, it is difficult to make it happen."

Disease management uses some principles of resource planning to deliver care to patients with a condition. For example, under a disease management protocol, patients with diabetes might "automatically" have their feet checked at each visit, receive some education materials about diabetes, have a phone call from a nurse who will talk about diabetes management, and receive a follow-up call to reinforce self-management.

However, despite being useful as an example of basic resource planning, disease management has a number of limitations. First, from both patient and healthcare professional perspectives, disease management does not easily accommodate the fact that patients with one disease have also other diseases or bothersome conditions (Boyd et al., 2005). A generic care management strategy is

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needed that would effectively and efficiently address several important issues at a time. Second, disease management focuses on disease and "what is the matter?" Because disease management is concerned about the clinical measures and issues, it can be behaviorally insensitive to "what matters" to a patient population (Moore and Wasson, 2006; Wasson et al., 2006). Resource planning for patient-centered, collaborative care will require knowledge of both "what is the matter?" and "what matters." Finally, disease management tends to be inefficiently "added on" rather than being "built in" to practice.

In this article, we use patient-reported information and the results from several controlled trials to construct a planned-care management strategy that cuts across diseases and conditions and also addresses health disparities attributed to low socioeconomic status (Braveman et al., 2005). We illustrate how behaviorally sophisticated care management can be planned and implemented more efficiently and effectively than a typical disease- or utilization-based strategy.

Data were derived from 13,271 respondents to www.howsyourhealth.org who were aged 50 years or older and who had at least one chronic disease or bothersome condition. Sixty-one of these respondents were women, 87% were aged between 50 and 69, 10% were between 70 and 79, and 3% were aged 80 and older. Sixteen percent of these patients had cardiovascular disease and 18% had diabetes

TWO COMMON DISEASES

More than 80% of the patients with a cardiovascular disease had other diagnoses or bothersome conditions. The most common were hypertension (64%), moderate or greater pain (59%), diabetes (28%), respiratory disease (20%), and bothersome emotional problems (16%). The burden of comorbidity was most influenced by patient financial status. For example, among poor financial status patients, 58% had 3 or more of these diagnoses or conditions, 49% took more than 5 medications, and 52% had both pain and bothersome emotional or social limitations. For comparison, the corresponding percentages among good financial status patients were 22%, 36%, and 16%, respectively.

Patients who participate in good collaborative care are likely to experience better outcomes (Wasson et al., 2006). By definition, these patients will be confident that they can manage and control most of their health problems. Table 1 confirms that cardiac patients' self-care confidence is associated with less use of the emergency department or hospital in the previous year. We have added additional subcategories on the basis of patient needs. When present, the categories of "pain and psychosocial problems" and poor financial status greatly reduce patient confidence with self-care and increase emergency department or hospital use.

Among patients with diabetes, many disease and conditions are also represented: 68% have hypertension, 58% have moderate or greater pain, 26% have cardiovascular disease, 20% respiratory disease, and 15% have bothersome emotional problems. Table 2 illustrates the same patterns for persons with diabetes we observed for healthcare utilization among cardiac patients, namely, the important impacts on self-reported blood glucose control by self-care confidence, the presence of pain and psychosocial problems, and financial status. Higher confidence is better than lower confidence. Poor financial status or pain and psychosocial problems are deleterious to disease control. We again notice that those patients having poor financial status with pain and psychosocial problems are the least likely to feel confident.

Regardless of disease or condition, we observe that patients with pain and psychosocial problems or low financial status have a low level of confidence because of deficiencies in communication and information transfer between patients and healthcare providers. We illustrate this general point in Table 3. The clinicians and the patients are most often not "on the same page" when patients have pain and psychosocial problems and low financial status.

Table 1. Percentage of cardiac patients using the emergency department or hospital at any time in the previous year*

	Confident	Somewhat confident	Not confident
% Any utilization among all patients with cardiac diagnoses	27 (*N* = 707)	31 (*N* = 916)	57 (*N* = 241)
% Any utilization for patients with different indicators of need			
Good financial status without pain and psychosocial problems	26 (*n* = 607)	27 (*n* = 644)	41 (*n* = 73)
Poor financial status without pain and psychosocial problems	36 (*n* = 39)	31 (*n* = 94)	66 (*n* = 25)
Good financial status with pain and psychosocial problems	24 (*n* = 46)	38 (*n* = 117)	41 (*n* = 56)
Poor financial status with pain and psychosocial problems	40 (*n* = 15)	50 (*n* = 61)	83 (*n* = 87)

*Pain and Psychosocial indicate moderate or greater pain *and* often or always bothered by emotional problems or limited social support.

THE CONSTRUCTION OF BEHAVIORALLY SOPHISTICATED CARE MANAGEMENT STRATEGY

A low-intensity, self-care strategy might consist of standard assessment, feedback to the physician, and tailored information for the patient ("infofeed"). "Infofeed" should address both clinician lack of awareness of problems that matter to patients and provide standardized high-quality information. A controlled trial has demonstrated some benefits

Table 2. Percentage of blood glucose level often or always in the range of 80–150 in diabetic patients*

	Confident	Somewhat confident	Not confident
% Blood glucose level often or always in the range of 80–150 among all patients with diabetes	76 (*N* = 775)	62 (*N* = 1057)	27 (*N* = 300)
% Blood glucose level of 80–150 for patients with different indicators of need			
Good financial status without pain and psychosocial problems	78 (*n* = 640)	77 (*n* = 688)	32 (*n* = 93)
Poor financial status without pain and psychosocial problems	73 (*n* = 66)	60 (*n* = 131)	27 (*n* = 49)
Good financial status with pain and psychosocial problems	78 (*n* = 41)	57 (*n* = 154)	29 (*n* = 75)
Poor financial status with pain and psychosocial problems	61 (*n* = 28)	45 (*n* = 84)	21 (*n* = 83)

*Pain and Psychosocial indicate moderate or greater pain *and* often or always bothered by emotional problems or limited social support.

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Table 3. Experiences of cardiac patients

	Without pain and psychosocial problems (*N* = 1482)	**Pain and psychosocial problems with good financial status (*N* = 219)**	**Pain and psychosocial problems with poor financial status (*N* = 163)**
% Receiving very good information about chronic conditions	68	51	23
% Reporting doctor or nurse aware of significant emotional problems *and* very good information received about the problems	27	27	13
% Reporting doctor or nurse aware of very bothersome pain *and* very good information received about the pain	43	34	15

when patients use "infofeed" and their doctors respond to it (Wasson et al., 1999). We call this strategy A.

We recently completed a controlled trial of generic "problem solving" and educational feedback tailored for patients aged 50 to 69 who had pain and psychosocial problems (Ahles et al., 2006). These patients also had many common diseases. They received the low-intensity strategy A: they completed the HowsYourHealth Survey from which information for them and their doctors was generated. In addition to this "infofeed," they received an average of 3 telephone calls from a nurse they had never met. The nurse coached them in problem solving. One year later, the results showed positive impacts in most measures of patient function for persons with a good financial status but there was little impact for those with a poor financial status. We shall call this intervention above the "infofeed" of strategy A, strategy B.

Taken together, these controlled trials suggest that while the "infofeed" of strategy A is necessary to "get on the same page," it is not sufficient for patients who have pain and psychosocial problems. The human interaction and coaching added to "infofeed," albeit on average limited to only a few phone calls, accounted for most of the effect. But the "infofeed" plus phone approach alone was not sufficient to overcome the greater deficiencies of patients with low financial status. These patients would probably require another strategy building on strategies A and B. We call this strategy C.

How might these strategies (A, B, and C) be applied across all patients and all diseases or conditions? On the basis of the insights provided from the controlled trials and the data shown in Tables 1 and 2, it is very likely that the patients clustered around the upper left corner are already doing quite well with self-care. For example, among the persons with diabetes eligible for an "infofeed" strategy A, blood glucose level is in good control most of the time. All of these patients are already confident or somewhat confident of their ability to manage or control their health problems (see Table 2).

Conversely, relatively few patients who are not confident or who are of poor financial status with pain and psychosocial problems will have good control of their blood glucose level. They will need an intensive "strategy C" intervention.

The patients eligible for neither strategy A nor strategy C are patients very similar to

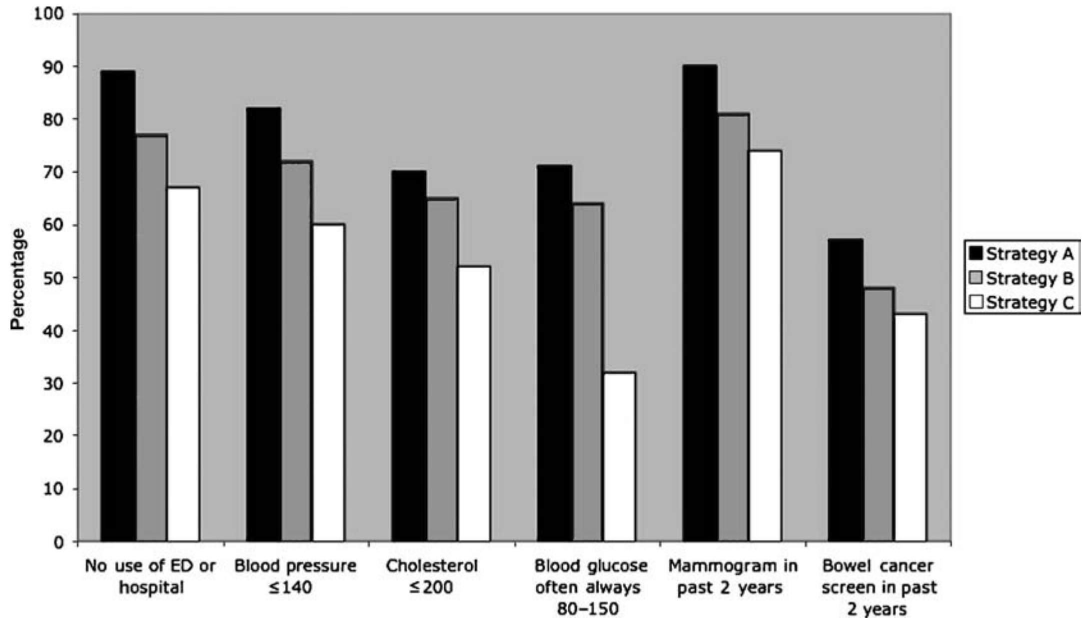

Figure 1. Healthcare processes and outcomes sorted by patient eligibility for planned-care strategies. ED indicates emergency department.

those who benefited in the controlled trial of strategy B—"infofeed" and phone-based, problem solving with reinforcement.

Figure 1 illustrates the association of these 3 strategies with clinical quality measures across all 13,271 patients aged 50 and older who have at least one chronic condition. The figure demonstrates a decline in all quality measures across strategies A, B, and C.

The decrement in quality shown in Figure 1 reflects both patient and practice characteristics. For example, across strategies A, B, and C, provider continuity declines from 91% to 84% and 77%; the reports of "perfect care" are 38%, 23%, and 10%, respectively.

Collaborative care requires both practice and patient change. When the practice processes are kept constant, as was the case in the controlled trial that supports the behavioral emphasis of strategy B, we observed benefits. We would expect even greater benefits if clinical practices improve their general processes and institute more behaviorally sophisticated planned-care management strategies.

RESOURCE PLANNING A MANAGEMENT STRATEGY FOR PATIENT-CENTERED, COLLABORATIVE CARE

Resource planning requires that the healthcare providers match what is known to be effective with the high-leverage "commonalities" among 80% of these patients. Once the needs of the patients are clear, the practice staff usually has to change roles and the care processes so that the patients in each stratum receive the care that is planned for them. Common barriers to resource planning are shown in Box 1.

We have described 3 strategies a practice or health system might use for planned-care management of patients with chronic conditions. While we have described 3 strategies, a practice might decide to simplify by combining strategy B with strategy C. The best way to estimate the work is to ask a random sample of 20 to 30 patients to respond to a survey about their conditions, financial status, confidence with self-care, bothersome pain,

Box 1.

Common Barriers to Effective Resource Planning

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- *A disease-specific focus*. A disease-specific focus is usually either very expensive or counterproductive because (i) patients usually have more than one disease and each "disease cycle" requires resources and (ii) the "disease" chosen by the "educator" may not be the problem that matters to the patient.
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- A failure to recognize that the most highly trained professionals (physicians and registered nurses) are often the least cost-effective providers of the strategies for 80% of the patients. Higher training is usually needed most to individualize care for the 20% of patients who "do not fit" the preplanned strategies.
- A failure of leadership to push for implementation of a more generic, planned, step care management strategy as a way to reduce waste resulting from current ineffective or redundant approaches. The staff must continuously remove waste and rework as they resource plan services to meet their patients' needs (Wasson et al., 2003; Wenger et al., 2003).
- *Failure to start small but plan large*. Resource planning needs to be introduced carefully to patients and the staff because it usually requires them to adapt to changes in roles and processes. Yet, careful introduction should not be an excuse to advance so slowly that the efficiency of planning for 80% of the care is not realized. Progress should be planned. For example, using a patient registry or a checklist at the time of vital signs, a practice might start with patients aged 50–69 having 3 or more conditions. After the practice has used planned-care management strategies for these patients over a 3–6-month period, it should plan expansion to patients of different ages or patients with one or more conditions.

and emotional problems. A tally of the responses enables the practice to plan resources for patients who will be eligible for the strategies.

AN EXAMPLE: THE IMPLEMENTATION OF A PLANNED-CARE MANAGEMENT STRATEGY IN A HEALTH SYSTEM THAT SERVES PREDOMINANTLY PATIENTS OF POOR FINANCIAL STATUS

Care South Carolina, a rural health system, serves 37,000 patients, many of whom are of poor financial status. It has adopted a mix of technology (such as disease registries) and good techne (such as standardized patient support with problem solving) to build its planned-care management strategy.

Care South Carolina recently studied diabetic and hypertensive patients whose blood glucose and blood pressure control had languished at less than optimum levels. Care South Carolina discovered that all of these patients had pain. This finding was a complete surprise and stimulated the organization to investigate whether stratification-based financial status, psychosocial problems, and confidence with self-management would work for its patients. A pilot test on 20 patients confirmed the predictions described previously. Care South Carolina learned that about 25% of adult patients are eligible for strategy C.

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The organization is now automatically offering many strategy C patients an option to participate in problem solving with a coach. It is also offering the strategy C patients helpful information that it has developed for patients with low-health literacy. About 50% of its patients will be in strategy A.

CONCLUSION

A link of specific interventions to different patient strata is an old concept. For emergency situations, it is called triage. For the treatment of blood pressure, it has been called "stepped care." And for the evaluation of the vulnerable elderly patients, it is considered a method to improve quality (Wenger et al., 2003). It is neither necessary nor possible to provide all things to all patients. But it is possible to plan the delivery of the most effective management strategies to the most appropriate group of patients. On the basis of the characteristics of a large sample of ambulatory patients aged 50 years or older and the results of controlled trials, we propose a planned-care management strategy based on several strata.

Our "infofeed" strategy A is the principle strategy for a large group of patients who are relatively much better at self-care than others. In most settings, a majority of patients will be eligible for strategy A. If a full "infofeed" strategy is not possible, a few items can screen patients and place them in strata useful for resource planning (the so-called CARE Vital Signs approach) (Godfrey et al., 2003; Wasson et al., 2003). As long as patients reliably receive information tailored to their needs and their clinician takes the feedback seriously, the patients should benefit (Wasson et al., 1999).

A smaller percentage of patients would need the addition of problem solving and brief telephone reinforcement by a member of the clinical team or an agent of the clinical team (strategy B). Strategy B would be modeled on phone-based, problem solving (Ahles et al., 2006). All patients in strategies A and B might benefit from a dedicated 24/7 telephone line with someone who understands their needs.

Strategy C would need to be better tailored to the significant deficiencies of patients who have either low confidence for self-care or who have poor financial status with the additional burden of pain and psychosocial problems. This strategy may be a more intensive version of strategy B coupled with great attention to literacy and remediable social needs. Group visits may also be helpful. Research is still needed to define the most effective strategy C.

The patient-reported information in this report is cross-sectional and limited in its ability to predict the future results of a planned-care management strategy. However, controlled trials that have tested the underlying behavioral strategies do suggest that future tests would demonstrate benefits.

We contend that a prospective planned-care management strategy is likely to be more efficient and effective than strategies based on concepts of disease management that focus on either a single disease or groupings of patients who are "high utilizers" of healthcare. Disease and utilization management strategies do not sort patients into behaviorally meaningful categories at the outset. After the patient is identified, the person delivering the special care must try to fit the patient to the program, or vice versa. In contrast, prospective resource planning of a behaviorally sophisticated strategy can use less highly trained persons to deliver most of the services. Such a strategy should always be more efficient and effective than rework after the fact.

We conclude that modern technologies and related approaches make resource planning for patient-centered, collaborative care feasible and desirable.

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