

Identifying High-Risk Medicare HMO Members: A Report from the HMO Workgroup on Care Management

APRIL 1996

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The HMO Workgroup on Care Management

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Foreword

In the fall of 1994 a group of HMO representatives, which came to be known as the HMO Workgroup on Care Management, was convened under the auspices of the Robert Wood Johnson Foundation "Chronic Care Initiatives in HMOs." *[The Chronic Care Initiatives in HMOs program is lodged at the Group Health Foundation, the nonprofit and educational arm of the American Association of Health Plans. Its principal objectives are: (1) to sponsor research and evaluations of interventions that have the potential to enhance the delivery of services to people with chronic conditions and (2) to foster the dissemination of information relating to best practices.]* The participants held senior medical and patient care management positions within their respective organizations, all of which enrolled significant numbers of elderly people under Medicare risk contracts.

The purpose of the Workgroup was two-fold. The first was to create an environment in which participants could exchange information on care management practices for chronically ill elderly populations, openly and candidly, at a more detailed and operational level than was achievable through attending conferences or reading the relevant literature. The second purpose was, if possible, to identify or develop a screening questionnaire for classifying the risk status of seniors in various HMO settings.

The Workgroup met on five occasions during the course of just over one year. To help bridge the gap between the HMO and academic worlds, two geriatricians on the faculty of the University of Minnesota Medical School, Department of Family Practice and Community Health (Chad Boulton, MD, and James Pacala, MD) were invited to participate in the meetings. As highly respected researchers and clinicians, they helped assure that the Workgroup was informed about relevant research and provided assistance in developing and testing a model screening questionnaire. In addition, Nancy Euchner, a geriatric nurse practitioner and a health care management consultant, served as a rapporteur and assisted in the preparation of this report.

This report primarily reflects the Workgroup's efforts to identify a model screening questionnaire. The reasons for doing so at the time the Workgroup was initially convened were several. First, among the health plans represented in the Workgroup, most of whom had years of experience in screening for at-risk seniors, the screening questionnaires differed significantly, including in length, content, and how they were employed. Second, none of the Workgroup participants were comfortable with the scoring systems they had adopted to weight the various questions on their respective screening questionnaires. The questionnaires had not been validated and, in most cases, composite risk scores were either not calculated or were based on professional judgment rather than scientific evidence. Finally, in our experience many health plans not represented in the Workgroup were confused about whether, how, and when to screen, and even the purpose of screening and how that function can be incorporated into a broader care management process.

Thus, the Workgroup believed that a screening questionnaire that identifies seniors who are at risk, with guidelines on its use, would be of value both to the HMO industry and capitated medical groups that serve the elderly. Indeed, one of the achievements of the Workgroup is that many of the participants intend to adopt within their respective organizations the questionnaire presented in this report and to be involved in further refinements.

Finally, on behalf of the RWJF Chronic Care Initiatives in HMOs program, we would like to thank the Workgroup members who contributed their time, expertise, and insights to this effort. We also thank PacifiCare of California for providing the data to develop a new screening questionnaire.

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Table of Contents

- I. Introduction and Executive Summary
- II. Screening and Its Relationship to Care Management
- III. Screening Questionnaire Selection and Testing
- IV. Other Considerations

I. Introduction and Executive Summary

This report presents a model screening questionnaire that was developed by the HMO Workgroup on Care Management and discusses issues surrounding its use. The questionnaire is presented in Appendix A and consists of two parts:

• Questions 1-6 and 16-17, the answers to which are used to calculate a risk score. *[Questions 16 and 17, related to enrollee sex and age respectively, are placed at the end of the questionnaire because health care plans may prefer to use administrative data rather than ask the questions. Also, individual plans may wish to change the placement of the two questions and ask them as Questions 7-8.]*

• Questions 7-15, which are optional and provide a "bridge" to the assessment process as well as information that may be useful for the medical record, e.g., functional status. It also includes questions that may result in the member being classified into the "Medicaid" and "institutional" rate cells, leading to higher Medicare reimbursement.

This report also presents the formula for deriving the risk score on individual responders (see Exhibit 1) and a scoring worksheet (see Exhibit 2) that illustrates how members' responses are converted to risk scores. The questionnaire has been field tested by Data Collection and Support Services at the University of Minnesota School of Public Health, can be understood by respondents with an eighth grade education, and can be administered either telephonically (e.g., as part of a welcome call) or by mail.

Other conclusions from the Workgroup's deliberations include the following:

• The distinction between screening and assessment is important and commonly poorly understood. Because screening and assessment are two distinct functions, employing a single questionnaire for both screening and assessment is not advised.

• Systematic screening for high-risk patients can generate a data base that has administrative value. It can serve as an important epidemiologic tool, and the existence of a formal screening process can demonstrate a commitment to population-based care that is consistent with accreditation standards of organizations such as the National Committee for Quality Assurance.

• The most common practice of HMOs that currently administer screening questionnaires to their Medicare risk members is to screen all new members by mail or telephone (e.g., through a new member call performed by member services). Individual plans may wish to screen periodically thereafter, as at least one Workgroup participant is doing. However, the utility of periodically re-screening existing Medicare members has not been determined, and further research is needed.

• Successful screening and case management requires strong administrative support at all levels

within the organization. Workgroup participants emphasized the need for provider education, particularly to physicians, on screening, assessment, and case management.

The Workgroup encourages health plans to screen Medicare members when they enter the plan. Senior members have different and more complex needs than non-senior members. Early identification of these needs may result in better patient management and outcomes that may result in lower health care costs. Screening is not an end in itself, and health plans should follow standards of practice for case management in putting the results of screening to use.

Exhibit 1

Exhibit 1

P_{ra} Scoring Formula

$$P_{ra} = \frac{e^{BX}}{1 + e^{BX}}$$

$$BX = -1.802 + .327X_1 + .340X_2 + .552X_3 + .770X_4 + .390X_5 + .545X_6 + .318X_7 - .738X_8 + .255X_9 + .327X_{10} + .559X_{11} + .257X_{12} + .319X_{13}$$

Predictor variables: 0 = absent 1 = present

- X₁ very good general health
- X₂ good general health
- X₃ fair general health
- X₄ poor general health
- X₅ coronary artery disease
- X₆ hospital admission in past year
- X₇ >6 physician visits in past year
- X₈ no informal caregiver available
- X₉ age 75-79 years
- X₁₀ age 80-84 years
- X₁₁ age 85+ years
- X₁₂ male sex
- X₁₃ diabetes in past year

Exhibit 2

Worksheet for Calculating P_{ra}

| MEMBER NAME: | DATE: | | SCORED BY: | | |
|--------------|-------------------------------------|-------|------------|------------|-------|
| | (No) | (Yes) | | | |
| ITEM** | PREDICTOR | 0 | 1 | MULTIPLIER | SCORE |
| 1 | self-rated health very good | | | .327 | |
| 1 | self-rated health good | | | .340 | |
| 1 | self-rated health fair | | | .552 | |
| 1 | self-rated health poor | | | .770 | |
| 2 | any hospital admission in past year | | | .545 | |
| 3 | >6 physician visits in past year | | | .318 | |
| 4 | diabetes in past year | | | .319 | |
| 5 | has coronary artery disease | | | .390 | |
| 6 | no informal caregiver available | | | -.738 | |
| 16 | male sex | | | .257 | |
| 17 | age 75-79 | | | .255 | |

| | | |
|----|-----------|------|
| 17 | age 80-84 | .327 |
| 17 | age 85+ | .559 |

SUBTOTAL

Subtract constant term -1.802

TOTAL (BX)

$$P_{\alpha} \text{ Score} = \frac{e^{BX}}{1+e^{BX}} = \frac{e^{-.867}}{1+e^{-.867}} = .70$$

RISK CATEGORY ACTION:

- High (score > .50)
- Moderate (score .35-.49)
- Low (score < .35)

Signature:

Date:

**"Item" refers to the question number on the model screening questionnaire in Appendix A.

II. Screening and Its Relationship to Care Management

The primary purpose of screening elderly members is to identify those who are at high medical risk, particularly for inpatient care. Screening represents the "broad end of the funnel" and is directed towards classifying individuals according to risk, needs, and eligibility for special programs. Classifying members according to their medical risk is but one element in a broader process of care management, which includes the following (see Exhibit 3):

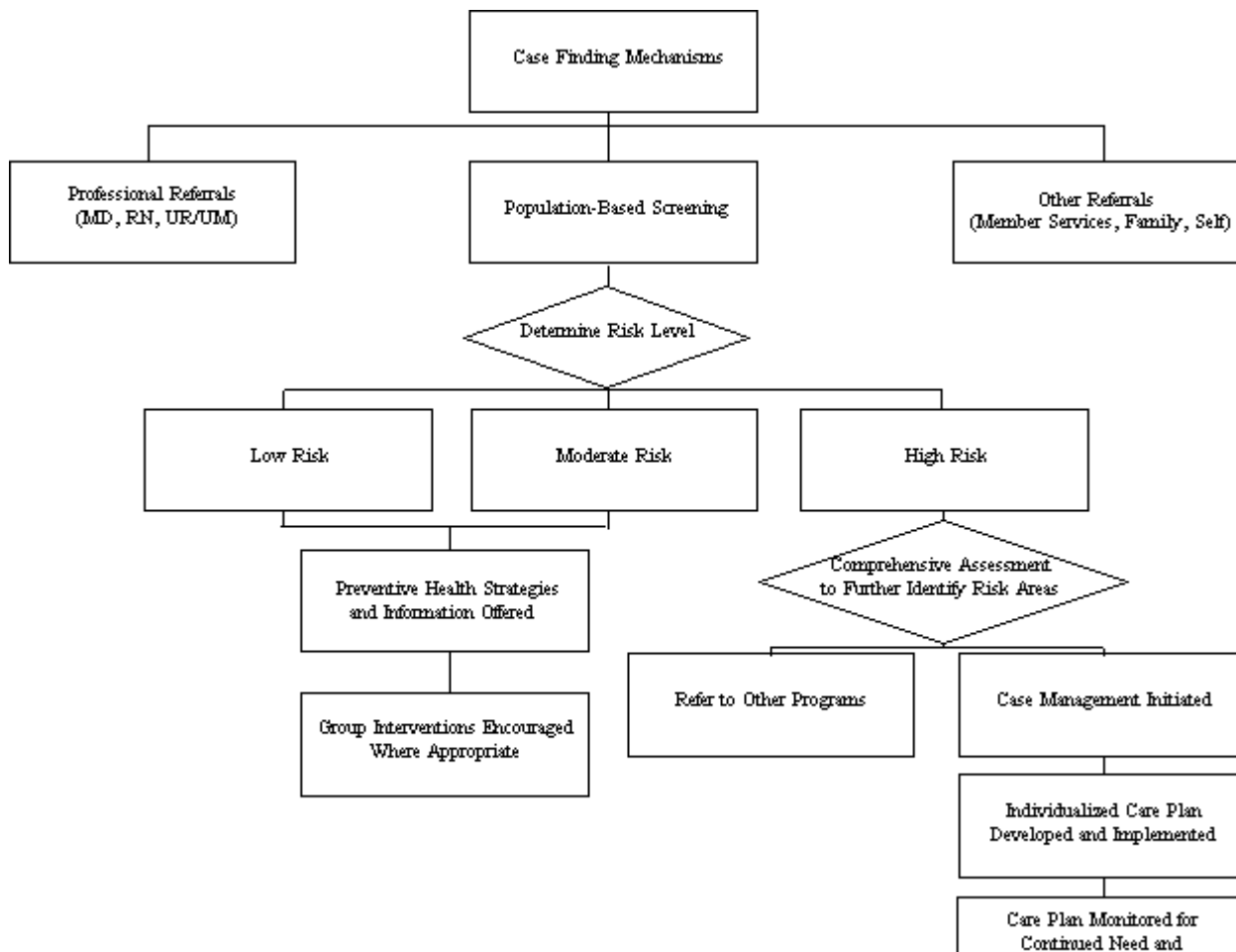
- **Case finding:** the process by which a health care provider identifies members of interest in the broadest sense, whether for case management or for certain disease management interventions. Case finding activities include screening (discussed below) and referrals such as from physicians, home care personnel, family, and self-referrals.
- **Screening:** the process by which a health care provider institutes specific criteria to select *potential* recipients of case management. A screening questionnaire can be administered to a defined population of members (e.g., all new enrollees) to identify those "at risk" of adverse health events who may be candidates for case management. Typically, as a result of the screening process, members are classified into two or more risk categories. *[Screening occurs after a senior member has elected to join the health plan and does not affect a Medicare beneficiary's enrollment in the HMO.]*
- **Assessment:** the process by which case management staff gather additional information to determine whether or not members who are identified by the screening questionnaire as being "high-risk" truly require case management intervention and, for those who do, what are their deficits and needs. Methods of assessment could include a limited review of patient records or face-to-face clinical evaluations by staff representing various disciplines. These assessments can be conducted in a variety of settings such as physician offices, a member's home, or the hospital.

- **Care planning:** the process of developing a plan of care for an individual member based on the findings of the assessment. A care plan may be limited to arranging temporary home care after a hospital discharge, or it may serve to integrate health care, social services, and informal care indefinitely.
- **Implementation:** the execution of the care plan, which may include providing the needed services, authorizing and linking clients to services to which they are entitled or for which they will pay, purchasing services from other providers, and advocating for the provision of informal services by family and friends.
- **Monitoring:** occurs on both the member's plan level (i.e., oversight of the member's care through periodic reviews of their health status and needs, evaluations of their satisfaction with and use of services, and reports of the ongoing costs of their care) and on an individual level (i.e., review of clinical status, problems, and interventions with the primary care physician and other appropriate members of the health care team).

Screening and assessment are often confused, but the distinction between them is important to understand. The following table contrasts the two processes:

Exhibit 3

Care Management Process diagram



Source: *The HMO Workgroup on Care Management, 1996.*

| | SCREENING | ASSESSMENT |
|---------------|---|--|
| Purpose: | To identify potentially high-risk members from enrolled population | to determine whether or not individuals who are identified as high-risk need case management or other services |
| Performed on: | All members | Only those identified to be at risk through case finding mechanisms, including referral |
| Performed by: | Administrative or clerical staff | Case managers or other health care professionals |
| Methods: | Brief mailed survey, telephone interview, or professional referrals | In-depth interview or examination, possibly including a home visit |
| Result: | Scoring of risk level (e.g., low, moderate, high) | Determine whether appropriate for case management and, if so, develop plan of care or refer to other programs (e.g., disease management, health promotion) |

Thus, screening is not an end in itself. Rather, it is an initial step in a care management process. The Case Management Society of America has developed standards of practice for case management which provide guidance in incorporating screening into a broader care management process. [*Case Management Society of America. Standard of Practice for Case Management. Little Rock, AR. 1995.*]

Many HMOs that have Medicare risk contracts use their own internally-developed screening questionnaires to identify high-risk members after enrollment. To the Workgroup's knowledge, however, none of the questionnaires has been statistically validated to determine the extent to which they identify truly "high-risk" members. Most questionnaires are scored using professional judgment, which can yield inconsistent results, especially if more than one professional is scoring the questionnaire. Consequently, none of the HMOs that were represented in the Workgroup were satisfied with their current screening questionnaires or risk scoring processes.

The use of a standard, validated screening questionnaire can enhance the consistency and reliability of identifying high-risk members. The two most important steps in developing a screening questionnaire are (1) to determine the questions that are predictive of an undesirable outcome (e.g., hospital admission; high costs) and (2) to develop a mechanism to determine risk levels, thus allowing thresholds to be set for various types of intervention (e.g., no formal intervention required; further assessment required; refer to case management). A scoring mechanism that results in a composite risk indicator or score allows a plan to target its resources to the populations that can benefit the most from them. This concept is discussed in more detail below in Section IV.

Some health plans may use the screening questionnaire and risk indicator not only to classify a senior member's level of risk but also to provide the case manager with information regarding the member's functional status or living arrangement prior to initiating a comprehensive patient assessment. In that case, the addition of a limited number of questions to bridge the gap between risk identification and case management action may be desirable, even if these questions do not increase the predictive ability of the risk indicator. Questions beyond those used for scoring risk, however, should only be

asked if they serve a specific purpose (i.e., what difference will it make?), and if the information could not be obtained more efficiently in another way. It must be borne in mind that long questionnaires are associated with increased cost and lower response rates.

Screening at the time of enrollment can have administrative benefits. For example, it can serve a financial function by helping to identify members who qualify for higher payments because they are in the so-called "institutional" or "Medicaid" rate cells for payment purposes. It can also identify those who require coordination of benefits, in particular members receiving renal dialysis under the ESRD program or hospice services under Part A of Medicare. In addition, the existence of a formal screening process can demonstrate a commitment to population-based care, which is consistent with good medical practice and also with oversight and accreditation standards of external review bodies such as the National Committee for Quality Assurance and those of many states.

Screening may serve other functions as well. The data that are collected can enable organizations to analyze longitudinal trends for planning purposes. For example, all patients with diabetes mellitus are identified and grouped according to their need for intervention. Those whose diabetes is managed through routine monitoring and dietary intervention may benefit from participation in group programs that the health plan offers. Those receiving medications and having early evidence of target organ involvement (such as heart or kidney disease) may benefit from different interventions, e.g., more frequent monitoring by primary care physicians. Members whose diabetes is difficult to control may be candidates for more intensive services coordinated by a case manager such as: review of medical record and regular consultation with the primary care provider; provision of individualized caregiver and patient education on diet, blood glucose monitoring, and medications; regular podiatric care; and assistance in the home with medication monitoring on an intermittent basis.

Finding mechanisms to identify members whose risk increases as they "age in place" in a particular health plan has posed a challenge to many HMOs. Most plans that screen their elderly members do so for new members. Although some plans do re-screen Medicare members annually, the utility of doing so has not been determined; research in this area is needed.

III. Screening Questionnaire Selection and Testing

The Workgroup's recommended questionnaire is presented in Appendix A and consists of two parts:

- Questions 1-6 and 16-17, the answers to which are used to calculate a risk score. *[Questions 16 and 17, related to enrollee sex and age respectively, are placed at the end because health care plans may prefer to use administrative data rather than ask the question. Individual plans may wish to change the placement of the two questions and ask them as Questions 7-8.]*

- Questions 7-15, which are optional and provide a "bridge" to the assessment process as well as information that may be useful for the medical record, e.g., functional status. It also includes questions that may result in the member being classified into the "Medicaid" and "institutional" rate cells, leading to higher Medicare reimbursement.

Exhibit 1 presents the formula for deriving a risk score on individual responders, and Exhibit 2 displays a scoring worksheet that illustrates how members' responses are converted to risk scores. The questionnaire has been field tested by Data Collection and Support Services at the University of Minnesota School of Public Health, can be understood by respondents with an eighth grade education, and can be administered either telephonically (e.g., as part of a welcome call) or by mail. The remainder of this chapter describes the analysis that was undertaken by the Workgroup to

identify the model screening questionnaire and resulting risk indicator.

Analysis

With extensive guidance from the Workgroup, the consultants performed analyses designed to:

1. develop a new risk indicator based on data from older adults who were newly enrolled in Secure Horizons (PacifiCare Health Systems Medicare risk HMO) and
2. compare the characteristics of this new risk indicator with those of a previously validated indicator, the P_{ra} (probability of repeated admission to a hospital), [Boult C, Pacala JT, and Boult LB. *Targeting elders for geriatric evaluation and management: reliability, validity, and practicality of a questionnaire. Aging: Clinical Experimental Research* 1995; 7(3): 159-164.] that was based on data from a national study (i.e., the Longitudinal Study on Aging). [Kovar MG, Fitti JE, Chyba MM. *The longitudinal study of aging. Vital Health Statistics* 1992; 1(28): 1-248.]

The data that were analyzed to develop the new risk indicator were collected using the Secure Horizons Health Inventory (SHIN), [Sutton JP and Aliberti E. *Characteristics of high-cost older adults who are newly enrolled in an HMO. Medical Interface* 1994; July: 65-71.] a self-administered questionnaire created by PacifiCare of California. PacifiCare mailed the SHIN to all new members in its Medicare risk program during a 5-month period in 1991-92. The respondents' answers were then linked to their subsequent use of health services during the members' first year of enrollment. Of the 21,000 SHIN questionnaires mailed, 58% were returned. Of these, 7,454 (60.1%) were completed by members who were age 65 or older at enrollment and whose utilization data were complete after one year. The remaining 40% were eliminated because their utilization data were incomplete or unavailable.

The objective of the analysis was to identify factors that predict high HMO costs. An annual cost of over \$1,000 above the capitation payment to a medical group was selected as "high cost." The medical group capitation payment covered mostly physician visits and clinic-based services such as lab and x-ray. Thus, the costs analyzed were those not included in the medical group capitation payment: hospital inpatient services, outpatient surgery, emergency room services, emergency transportation services, skilled nursing facility services, durable medical equipment, and home health care services. In some cases, however, costs for skilled nursing facility, home health care, and durable medical equipment services were incorporated into medical group capitation payments.

Prior to the analysis, the Workgroup developed a list of factors that it believed was predictive of frequent and costly service use. These factors included: demographic information (age, gender); health status (self-reported health status and presence of certain chronic illnesses); functional status (level of dependence in activities of daily living and instrumental activities of daily living); psychosocial functioning and support (cognitive functioning, housing situation); and prior service use (prior hospital stays, physician visits, emergency room visits). These were among the factors that were selected from the SHIN (shown in Exhibit 4) that were subjected to univariate analysis.

The population of elderly (SHIN subjects) for whom completed questionnaire and utilization information was available (n=7,454) was randomly divided into two samples -- a derivation sample (n=3,684) and a validation sample (n=3,770). Data from the derivation sample were analyzed using logistic regression to evaluate the degree to which each factor that had initially correlated with future high cost could still predict high cost when all of the other factors were held constant. Twelve such factors emerged: age; sex; self-rated health (on a 1-4 scale); type of residence (i.e., house, apartment,

board and care, nursing facility); cohabitation status (i.e., lives alone, lives with spouse, lives with family); functional status; mental problems; and difficulty with breathing, blood pressure, lower extremity swelling, heart, or urinary system (see Exhibit 5). These twelve factors constitute a new instrument that when

applied results in a score termed P_{ac} -- the probability that a member will incur additional costs, i.e., more than \$1,000 in the following year.

Using data from the validation sample of SHIN subjects, two baseline risk scores were computed for each member: P_{ac} from the new questionnaire and P_{ra} [P_{ra} = the probability that a member will have repeated hospital admissions in the following four years.] from the previously validated questionnaire. The formulae for computing both risk indicators have the logistic form: $P = \frac{e^{BX}}{1+e^{BX}}$ (see Exhibits 1 and 5). Both risk indicators could be computed from responses to the SHIN questionnaire because there is substantial overlap between the SHIN questions (source of questions to derive P_{ac}) and the questions needed to derive P_{ra} . However, because the SHIN questionnaire did not request all of the data needed to compute P_{ra} , assumptions had to be made to provide "answers" to the P_{ra} questions about the two strongest (of eight) predictive factors in the P_{ra} formula: general health (no "very good" response category) and the availability of an informal caregiver (not asked). [Of the SHIN respondents who rated their general health as "good," a randomly-selected 40% were coded as "very good" and 60% as "good." Instead of assigning either 0 or 1 to each subject's "caregiver" term (see Exhibits 1 and 5), .07 was assigned to all subjects, reflecting the observation that 7% of a national (LSOA) sample of older Americans had responded affirmatively to the caregiver question. (Boult C, et al. Screening elders for risk of hospital admission. Journal of the American Geriatric Society 1993; 41: 811-817.)] A worksheet demonstrating how to derive a risk score, using the P_{ra} indicator as an example, is found in Exhibit 2.

Exhibit 4

Possible Predictors of High Cost Addressed by the SHIN Questionnaire

Demographic Factors

Age

Sex

Environmental Factors

Cohabitation status

Type of residence

Health-Related Factors

Self-rated health--excellent, good, fair, poor

Medical conditions--arthritis, memory problems, heart problems, mental problems, digestive problems, lower extremity swelling, cancer, breathing problems, urinary problems, high blood pressure, bowel problems, diabetes, other

Pain interference with activities

Pain--in head, neck, legs, back, stomach, heart, arms, knees, feet, other

Functional Factors

- Activities of Daily Living (ADL)--bathing, eating, toileting, dressing, mobility
- Instrumental Activities of Daily Living (IADL)--taking medications, preparing meals, keeping house, shopping, managing money, transportation
- Support--Meals-on-Wheels, oxygen, breathing medicine, hospital bed, wheelchair, other

Life Style

- Meals per day
- Exercise
- Cigarette smoking

Health Care

- Influenza vaccine
- Medicaid eligibility
- Living will

Exhibit 5

Exhibit 5

P_{ac} Scoring Formula

$$P_{ac} = \frac{e^{BX}}{1 + e^{BX}}$$

$$BX = -2.179 + .439X_1 - .043X_2 + .320X_3 + .145X_4 + .221X_5 + 1.084X_6 + .378X_7 + .343X_8 + .434X_9 + .237X_{10} + .506X_{11} + .349X_{12} + .296X_{13} - .022X_{14} + .103X_{15} + .059X_{16} + .239X_{17}$$

Predictor variables 0 = absent 1 = present

- X₁ male sex
- X₂ good or very good general health
- X₃ fair general health
- X₄ poor general health
- X₅ heart problems
- X₆ mental problems
- X₇ ankle/leg swelling
- X₈ breathing problems
- X₉ urinary problems
- X₁₀ high blood pressure

| | |
|----------|--|
| X_{11} | lives in nursing facility, board and care, assisted living, or other |
| X_{12} | lives alone |
| X_{13} | needs any assistance with any ADL or IADL |
| X_{14} | age 70 - 74 years |
| X_{15} | age 75 - 79 years |
| X_{16} | age 80 - 84 years |
| X_{17} | age 85+ years |

Comparison of Two Risk Indicators: P_{ra} and P_{ac}

As a result of the analysis described above, the Workgroup had two possible risk indicators to consider: the P_{ra} (previously developed by the University of Minnesota) and the P_{ac} (developed by the Workgroup). The following criteria were used to compare the two risk indicators:

Predictive validity: the risk indicator should reliably distinguish between members at high-risk and those at low-risk; too many false positives (i.e., patients identified for follow-up who are not high-risk) is costly and may overwhelm case management resources; false negatives (i.e., failure to identify patients who are high-risk) can result in missing members who require more immediate intervention to prevent undesirable outcomes.

To measure the predictive validity of P_{ra} and P_{ac} , SHIN subjects were then rank-ordered in terms of their P_{ra} and P_{ac} scores. As shown in Exhibit 6, when the P_{ra} and P_{ac} thresholds for high risk were set to identify about *one quarter* of the population as high-risk, the average P_{ra} high-risk member incurred somewhat higher costs than the average P_{ac} high-risk member during the following year: \$2,796 (equal to \$233 per member per month or pmpm) vs. \$2,626 (\$219 pmpm). Thus, the P_{ra} appears to be slightly more accurate than the P_{ac} in identifying a 25% subpopulation of members who will incur high HMO costs in the following year, even when data from its two most predictive questions (i.e., general health and availability of an informal caregiver) are not available and must be estimated. Its margin of superiority will probably be greater in field use when all eight questions needed to compute P_{ra} are asked, and none are estimated.

Parsimony: the questionnaire used to compute the risk score should only contain those questions needed to identify risk and trigger further intervention; lengthy questionnaires are costly to administer and are more likely to create problems of incomplete information and non-response.

Both risk indicators that the Workgroup considered are based on questionnaires that are brief and easy to understand. The P_{ra} risk indicator is based on a questionnaire with 8 items, and the P_{ac} on a questionnaire with 12 items.

Exhibit 6

Predictive Validity of P_{ra} and P_{ac} Ratings

Average Annual HMO Costs
(in addition to physician capitation payments)

| <u>High-Risk Threshold</u> | High-Risk Members | | Low-Risk Members | |
|--|-------------------|-------------------|--------------------|--------------------|
| | P_{ra} | P_{ac} | P_{ra} | P_{ac} |
| One Quarter of Population at Highest Risk | \$2796 (n=856) | \$2626 (n=934) | \$1035 (n=2574) | \$1044 (n=2709) |

Some of the 3770 subjects could not be classified because of missing data on the SHIN questionnaire: P_{ac} was not calculable for 127 (3.4%); P_{ra} was not calculable for 340 (9.0%).

Face validity: the questions used to calculate the risk indicator should "look like" they measure what they intend to measure.

Individuals from different clinical disciplines will use different criteria in judging a questionnaire's face validity. Physicians may look for diagnostic data, and case managers may want data on functional status. Initially, concern was expressed about the absence of questions regarding functional status in the battery of questions that serve to compute the P_{ra} risk indicator: might the P_{ra} index fail to identify functionally impaired persons as high-risk? We found, however, that the prevalence of functional impairment among the P_{ra} high-risk members in the PacifiCare validation sample was 41% even though the questions about functional ability were not used to compute P_{ra} . By comparison, the prevalence of functional impairment among members who were identified as high-risk by P_{ac} , which includes functional status measures in its calculation, was 54%. Both P_{ac} and P_{ra} high-risk members had comparable prevalence of other chronic conditions that were the subject of P_{ac} questions but not P_{ra} questions: arthritis (38%, P_{ac} vs. 33%, P_{ra}) and high blood pressure (42%, P_{ac} vs. 36%, P_{ra}). These findings are probably explained by a high degree of correlation among these markers of chronic illness.

Guidance for assessment: the questionnaire should ideally both classify senior members' level of risk and help to initiate the assessment process for those at risk. Some questions can serve as a bridge between risk identification and case management even if these questions do not increase the

predictive ability of the risk indicator.

Both questionnaires are designed primarily to classify members' risk status. Neither supplies all of the information required to assess the clinical needs of high-risk members. However, the twelve items needed to compute P_{ac} provide more guidance for assessment than the eight items needed to compute P_{ra} .

Administrative ease: the questionnaire should be administrable by a non-clinical staff member (i.e., clerical or member services staff) and also should be able to be administered, at the health plan's election, either in written form or by telephone.

Both questionnaires are efficient to administer and appropriate for use by both telephone and in written form.

Generalizability: the risk indicator should predict risk accurately in older populations that differ in their geographic, demographic, health-related, and insurance coverage characteristics from the population on which the indicator was derived.

The P_{ra} risk indicator has been-- and continues to be-- tested in diverse populations. It has been shown to be a valid predictor in two published studies, one of a dually eligible Medicaid-Medicare population followed for one year [Pacala JT, Boulton C, and Boulton LB. Predictive validity of a questionnaire that identifies elders at risk for hospital admission. *Journal of the American Geriatric Society* 1995; 43: 374-377.] and the other in a representative sample of all older Americans followed for four years. [Boulton C, et al. Screening elders for risk of hospital admission. *Journal of the American Geriatric Society* 1993; 41: 811-817.] In each study, the P_{ra} high-risk persons went on to use hospital services at twice the rate of low-risk persons. The generalizability of the P_{ac} is unknown at this time.

Test-retest reliability: the questionnaire should reproduce similar results when administered to the same subject on repeated trials.

The test-retest reliability of the questionnaire that produces the P_{ra} has been shown to be high ($r = .78$). [Boulton LB, Boulton C, Pirie P, and Pacala JT. Test-retest reliability of a questionnaire that identifies elders at risk for hospital admission. *Journal of the American Geriatric Society* 1994;42:707-711.] The test-retest reliability of the questionnaire for the P_{ac} is unknown at this time.

Recommendation

The Workgroup spent considerable time discussing the merits of both risk indicators and struggled to reach consensus for a recommendation. Both predicted high costs in the analysis; however, the P_{ra} had greater predictive validity. The P_{ra} also has been tested more extensively in the field; it is reliable and generalizable. Although both perform equally well on many of the other criteria for risk indicators, the questionnaire used to calculate the P_{ac} risk indicator provides more guidance for assessment.

The final questionnaire recommended is that shown in Appendix A and is a combination of the

questions needed to calculate P_{ra} and P_{ac} . The P_{ra} score, which is based on questions 1-6 and 16-17 (formula in Exhibit 1), should serve as the primary indicator of risk because of its greater predictive validity and proven track record. However, because of important implementation issues (i.e., guidance for assessment, verification of capitation levels, diagnosis management), the additional questions needed to compute the P_{ac} risk indicator as well as supplementary questions were included in the questionnaire.

IV. Other Considerations

This chapter discusses matters that warrant consideration once a screening questionnaire and scoring formula have been selected:

- determining the thresholds for defining risk categories for purposes of patient management;
- provider education and support;
- questionnaire formatting and completion time;
- the cover letter for a mailed questionnaire; and
- future directions in improving the screening process.

Establishing Risk Categories

The purpose of using a screening questionnaire is to classify members into risk categories. Initially the screening data are used to compute a risk score for each member. Thresholds must then be established that divide the scores into risk categories, e.g., low, moderate, and high. The thresholds for risk categories can be established using either of two methods:

- **risk-driven**, i.e., preselecting a risk score as the cutoff for further intervention, and
- **resource-driven**, i.e., selecting cutoffs based on the number of enrollees that can be served in light of the resources that the plan is prepared to devote to a given intervention.

Risk-Driven Designation of Categories

Using this method, the organization determines the thresholds for risk categories according to the level of risk it wishes to identify. For example, it is known from previous research that persons with P_{ra} scores of 0.5 or greater have twice the hospital days and costs of those with scores below 0.5. Accordingly, an organization using the P_{ra} could select 0.5 as its threshold for high risk.

Different populations comprise different percentages of high, moderate, and low-risk people. For the P_{ra} , about 7% of general elderly populations [Boult C, et al. *Screening elders for risk of hospital admission. Journal of the American Geriatric Society* 1993; 41: 811-817.] and 18% of Medicaid elderly populations [Pacala JT, Boult C, and Boult LB. *Predictive validity of a questionnaire that identifies elders at risk for hospital admission. Journal of the American Geriatric Society* 1995; 43: 374-377.] have risk scores of 0.5 or higher.

Resource-Driven Designation of Categories

Under this method, the organization determines the thresholds for risk categories according to the number of its members it wishes to place in each category. This method is pragmatic and helpful in allocating limited resources. For example, suppose that an organization wished to provide a high intensity case management program [Pacala JT, et al. *Case Management of Older Adults in Health Maintenance Organizations. Journal of the American Geriatrics Society* 1995; 43: 538-542.] to its highest-risk seniors, and its budget would allow for 10% of its members to receive the benefit. [The 10% figure is higher than would be typical and is used herein for illustrative purposes only.] In addition, suppose that the budget would allow another (lower risk) 25% of its members to take part in targeted prevention and health promotion programs. To establish thresholds for the high, moderate, and low risk categories using the resource-driven method, the organization would first administer the screening questionnaire to its entire elderly population. The 10% of members with the highest risk scores would be classified as high-risk and would enter the high intensity case management program. Those scoring in the 65-90th percentile would constitute the moderate-risk group and qualify for the less intensive interventions.

Exhibit 7 illustrates how a population of 10,000 members might be classified if P_{ra} thresholds were set to .40 and above to indicate high-risk and .30 to .39 to indicate moderate-risk. For example, 1,000 of the 10,000 members (10%) would be classified as high-risk and 2,500 (25%) as moderate-risk, with the remaining 6,500 (65%) as low-risk. Exhibit 8 illustrates how another organization, also with 10,000 senior members but with fewer resources, might use P_{ra} thresholds of .50 and above to indicate high-risk and .35 to .49 to indicate moderate-risk. In particular, only 300 of the 10,000 members (3%) would be classified as high-risk, 1,800 (18%) as moderate-risk, and 7,900 (79%) as low-risk.

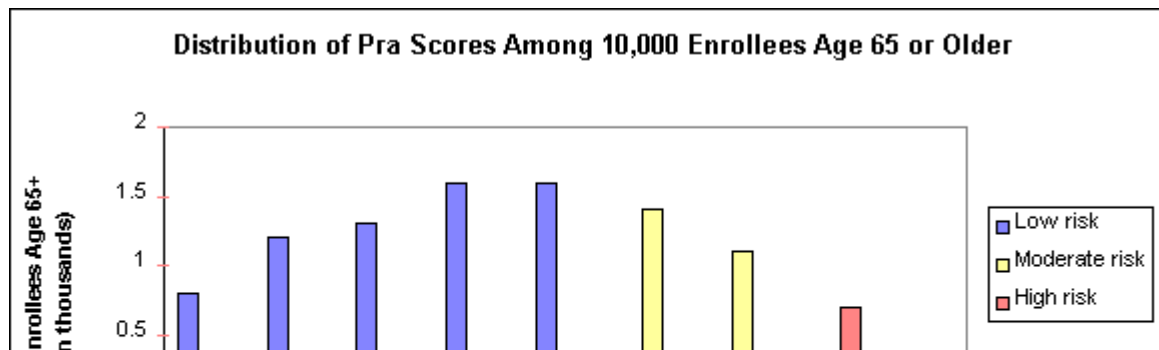
Provider Education and Support

The concept of screening to identify high-risk members has captured the interests of many HMOs with Medicare risk contracts in particular. [National Chronic Care Consortium. *Risk identification: exploring a conceptual framework and understanding implementation issues. Bloomington, MN. 1995.*] [Yedidia P. *Medicare risk contracting: early identification and follow-up of high risk enrollees are essential first steps to success. MGM Journal* 1995; 42: 46-48.] For screening and case management to be successful, however, there must be strong administrative support at all levels within the organization. Workgroup participants also emphasized the need for provider education,

particularly to physicians, on both screening and case management including:

Exhibit 7

Risk Categories Established by HMO with Greater Case Management Resources



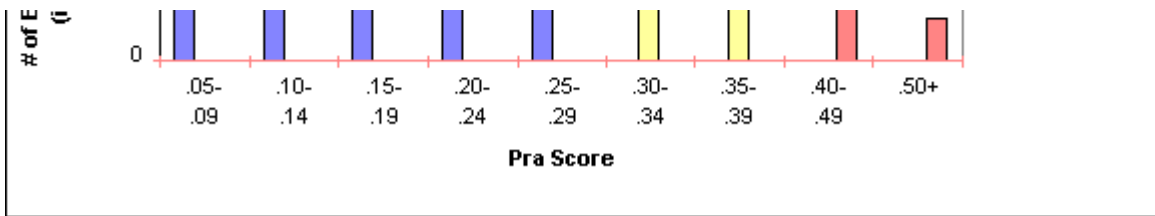
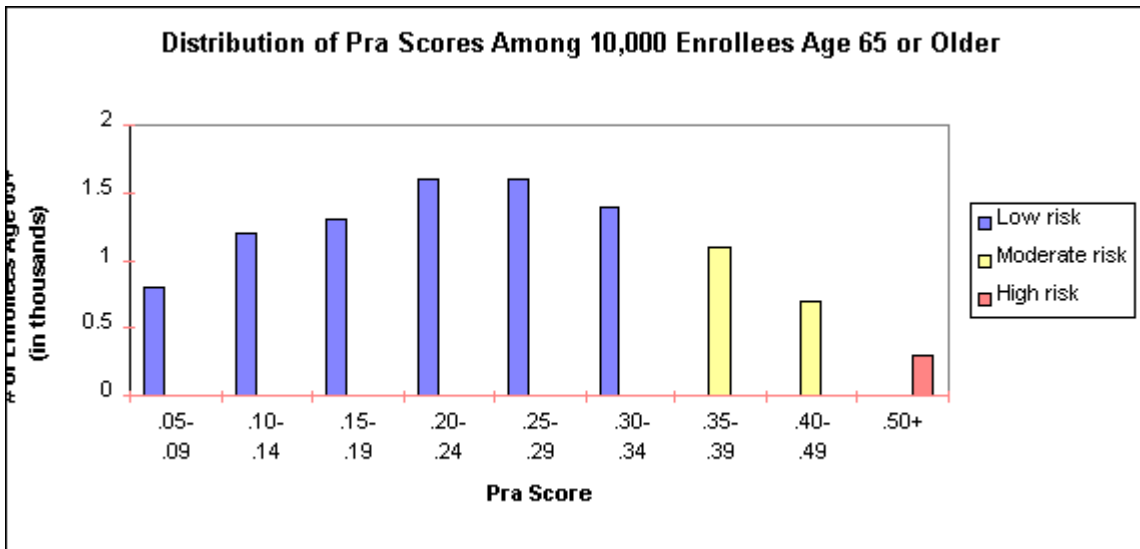


Exhibit 8

Risk Categories Established by HMO with Fewer Case Management Resources



- describing the purpose of a screening questionnaire;
- illustrating the types and uses of in-depth assessments of high-risk members;
- describing the roles and responsibilities of case managers and their relationship to the primary care team; and
- reviewing criteria and procedures for referral to case management or other programs.

One Workgroup participant, who formerly was with FHP in southern California, noted that a comprehensive physician education effort had increased the percent of referrals by physicians to case management from 13% to 44%. Moreover, a physician satisfaction questionnaire that was administered at FHP showed that 93 percent of primary care physicians responded that the case management program was of value to them in their practice. The physicians also gave high marks to the collaborative role of the case manager and the ability of case managers to focus on patients' long-term issues in addition to the patient's current crisis or episode.

Questionnaire Formatting Issues and Completion Time

The eight questions that are used to calculate the P_{ra} risk score and the additional questions of interest were put into a user-friendly questionnaire and field-tested with two samples of older adults: telephone screenees (n=23) and in-person paper-and-pencil screenees (n=37). Based on observations

by the technicians who administered the questions and on feedback from the screenees, the self-administered questionnaire and the telephone script were revised to maximize their clarity and ease of completion.

People had little difficulty completing the questionnaire, which is written at about an eighth grade level. The question that gave screenees the most difficulty asked whether the respondent was currently receiving Medicaid. This question is not incorporated into the calculation of risk scores and was added to obtain additional administrative information about members. If plans decide to keep the question in the screening questionnaire, the wording should be modified to reflect how the Medicaid program is referred to in the member's state of residence (e.g., MediCal in California).

The resulting model screening questionnaire (see Appendix A) can be administered in writing or by telephone. When administered by telephone, the greeting and introductory statements plus the eight P_{ra} questions required an average of 2.4 minutes for completion (range of 1-5 minutes). Asking the other nine questions added an average of 4.7 minutes (range of 3-9 minutes). On average, the complete telephone interview lasted 7.1 minutes (range of 4-11 minutes).

Obtaining reliable answers from members by telephone requires proper interviewing technique. Interviewers should be selected carefully based on their verbal abilities and interpersonal style. The proper training of interviewers will probably require 20-24 hours and should include: orientation to the screening program; a manual; lectures; supervised practice sessions with feedback; and certification interviews. The interviewers must learn to read all questions exactly as written to avoid leading the member toward particular responses, and to withhold unscripted comments. The lectures should address topics such as: beginning the interview; pacing; confidentiality; responding to members' questions; skip patterns; recording data; dealing with reluctant members; refusals; and editing.

Cover Letter for Mailed Questionnaire

A carefully worded cover letter is essential to obtaining a high response rate to a mailed questionnaire. The letter should be brief and friendly. It should be written at an eighth grade level or lower, depending on the population to be screened and should emphasize that the member's responses will help his or her physician to provide better health care. If possible, it should be personalized and signed by the member's physician. It should include a stamped, addressed return envelope and a phone number to call if the member has questions. A sample letter appears in Exhibit 9.

Future Directions

Further work is needed to adapt the screening questionnaire presented in this report for use in special subgroups of the Medicare population. In particular, the Workgroup is interested in formatting the questionnaire for use with populations of lower educational attainment, non-English speakers, and those with cognitive impairment. In addition, the screening questionnaire needs to be evaluated from a variety of perspectives including: How is the information that is gathered used by plans (i.e., by physicians, case managers, and administrators)? What recommendation can be made about re-screening?

The Workgroup encourages health plans to screen Medicare members when they enter the plan. Senior members have different and more complex needs than non-senior members. Early identification of these needs may result in better patient management and outcomes that may result in

lower health care costs. Screening is not an end in itself, and health plans should follow standards of practice for case management in putting the results of screening to use.

Exhibit 9

Sample Letter to Members

March 1, 1996

Mrs. Marilyn Martin
435 Avondale Street
St. Paul, MN 55107

Dear Mrs. Martin:

As your primary physician, I want to help you stay as healthy as possible. One way I do this is by asking you some questions about your health every year. I hope that you will help me by answering the enclosed questions as soon as possible. It will take only 5-10 minutes. Another person may help you, if you wish. If you have any problems completing the form, feel free to call Mary King at (800) 555-1212. She'll be glad to help.

Your answers will not reduce your health insurance coverage in any way. They will be used only to help me offer you the best care.

When you have answered the questions, please mail the form back to me in the enclosed stamped, self-addressed envelope. Thanks again for your help.

Sincerely,

John Screen, MD

Enclosure

Appendix A

Model Screening Questionnaire

**The questionnaire is available in Adobe .pdf format on the AAHP Homepage under "Chronic Care," then "HMO Workgroup on Care Management."*

The model screening questionnaire (both mail and telephone versions) and a user manual for the telephone version are copyrighted by the Regents of the University of Minnesota.

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FAX: 612/624-8448
Email: dyson001@maroon.tc.umn.edu

Licensees will receive a copy of both the mail and telephone versions of the questionnaire and a user manual for the telephone version. The annual fee for each license is \$500. Seventy-five percent of the license fees will be used solely to support the licensing and distribution of the screening questionnaire and the University of Minnesota's continued research in the fields of aging and geriatrics.