

CLINICAL AND COST OUTCOMES
OF AN
INTEGRATIVE MEDICINE IPA

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Abstract

Background:

Conventional medicine has controlled neither the increasing prevalence of chronic disease nor the escalation of medical expenditures. We hypothesized that primary care physicians (PCPs) specializing in a non-pharmaceutical/non-surgical approach as their primary modality and utilizing a variety of complementary/alternative medicine (CAM) techniques integrated with allopathic medicine would have superior clinical and cost outcomes compared to PCPs utilizing conventional medicine alone.

Design:

Incurred claims and stratified randomized patient surveys were analyzed for clinical outcomes, cost offsets and member satisfaction compared to normative values. Comparative blinded data, using nonrandomized matched comparison groups was analyzed for age/sex demographics and disease profiles to examine sample bias.

Setting:

An integrative medicine independent provider association (IPA) contracted with an NCQA-accredited HMO in metropolitan Chicago.

Subjects:

All members enrolled with the integrative medicine IPA from 1/1/99 through 12/31/02.

Results:

Analysis of clinical and cost outcomes on 21,743 member months over a 4-year period demonstrated decreases of 43.0% in hospital admissions/1000, 58.4% hospital days/1000, 43.2% outpatient surgeries and procedures/1000 and 51.8% pharmaceutical cost reductions when compared to normative conventional medicine IPA performance for the same HMO product in the same geography over the same time frame.

Conclusion:

In the limited population studied, PCPs utilizing an integrative medical approach emphasizing a variety of CAM therapies had substantially improved clinical outcomes and cost offsets compared to PCPs utilizing conventional medicine alone. While certainly promising, these initial results may not be consistent on a larger and more diverse population.

Key Indexing Terms:

CAM Therapy; Medicine; Outcomes; Primary Care Physician; Managed Care

Introduction

The escalation of medical expenditures is an urgent problem. Although various types of managed care, once thought by some to be part of the solution to increasing medical expenditures, have been used for decades, little evidence exists that this or any other cost-containment strategy has significantly influenced a 50-year trend of increasing medical expenses on a long-term basis¹⁻⁵. Managed care rates are now posting double-digit annual increases⁶, with pharmaceuticals estimated to account for 50% of the cost increases over the past three years⁷.

While the healthcare system excels in acute care and crisis disease-state-management, this accounts for only a small percentage of the total medical care in both cost and volume rendered daily⁸. The greater healthcare burden is the prevention and treatment of the multiple chronic disorders in the general population that now account for the majority of health care expenditures⁹.

Chronic diseases are a major public problem in the United States. Currently, about 40% of the US population (approximately 100 million Americans) suffers from at least 1 chronic disorder⁹. This high level of prevalence within the United States raises concerns about the efficacy and limitations of our conventional healthcare system¹⁰. Such concerns appear to contribute to public and professional interest in alternatives to conventional modern medicine.

Studies now suggest that 50% of the deaths¹¹ and 70% of the diseases¹² in the United States are caused by unhealthy lifestyle habits such as smoking, alcohol abuse, and improper diet. Unlike the pre-antibiotic era when mortality was primarily because of infectious diseases, our nation

now faces a behavior-induced epidemic of chronic illness. Managed care and government policy makers are faced with the dilemma of trying to decrease medical costs caused mainly by lifestyle choices while continuing to maintain personal freedom of choice.

Iatrogenic illness (an adverse condition arising from the treatment of a physician) is estimated as the etiology of 15% of our hospital days and pharmaceuticals are estimated to cause between 100,000-250,000 deaths per year^{13,14} as well as non-quantifiable morbidity. Prescription drug addiction, administering the wrong drug, and prescription overdoses are a large percentage^{15,16} of reported deaths by medical mistake. The National Conference of State Legislatures, Nov/Dec 2000 estimates the cost of lost income, disability and health care resulting from medical mistakes is as much as \$29 billion per year¹⁷.

Given these facts it may be time to rethink this country's current medical model with its overall reliance on pharmaceuticals as a first line option. Complementary/alternative medicine is one viable approach that should be considered because it addresses the privacy, quality and expense considerations facing health care delivery systems.

Unlike conventional medical education and care, which relies heavily on high technology and pharmaceuticals, complementary/alternative medicine exists in a "low-tech arena." "Low-tech" therapeutic modalities such as Chiropractic manipulation, homeopathy, stress management, massage, and utilization of herbal medicines are perceived by the public as more gentle, less morbid and less costly than conventional modern medicine¹⁸.

Many previous studies on various complementary/alternative medicine (CAM) modalities have illustrated improved clinical outcomes and substantially decreased costs compared to standard conventional medical practice protocols¹⁹⁻⁴⁴. However, while individual diagnostic categories have been analyzed, a study of the clinical outcomes and cost effectiveness of PCPs specializing in CAM, and more particularly Chiropractic care, within the context of a classical gatekeeper HMO has never previously been attempted.

Methods

Data reported in this study were drawn from incurred claims data, originating from both the Integrative Medicine IPA and the HMO. The IPA data included all inpatient and outpatient encounters for both cost and diagnosis including: the professional fees associated with patient referrals, outpatient diagnostics (encounters and costs), and outpatient labs (encounters and costs). The HMO data included the encounters and costs of all pharmaceutical usage, inpatient admissions and outpatient surgery and procedures. This information was collected prospectively over a 4-year period.

The HMO actuarial department prepared an annual financial projection for the IPA membership as an age/sex risk adjusted population. On a cost basis, the discrepancies between the projected costs versus the actual costs were analyzed annually.

Standard managed care benchmarks including hospital days/1000; hospital admissions/1000, outpatient surgeries and procedures/1000 and pharmaceutical utilization were reported annually by the HMO (normative network values) and then compared to the actual utilization of the integrative medicine IPA.

Randomized patient surveys were conducted annually by the HMO to assess member satisfaction, quality of care benchmarks and member behavior patterns (e.g., tobacco usage).

Integrative Medicine IPA - Development and Implementation

In 1996, a large HMO accredited by the National Committee for Quality Assurance (NCQA) servicing the metro Chicago area was initially contacted to test the feasibility of gathering data on a CAM-oriented healthcare delivery system. This HMO was a classical gatekeeper HMO with over 600,000 members enrolled in the greater Chicago area.

The project's objective was to build an integrated medicine system in the Chicago metropolitan area that would utilize primary care physicians (PCPs) who specialize in a non-pharmaceutical/non-surgical approach as their primary modality. These non-pharmaceutically oriented PCPs, notably Chiropractic physicians, were organized into a well-defined structure along with their more conventional allopathic counterparts to create a truly integrated health care system encompassing both CAM therapies and conventional modern medicine within a single comprehensive insurance benefit structure. The project was designed for a gatekeeper HMO format because its structure simplified data collection and made mandatory reporting a contractual obligation.

To test this new model, an "alternative medicine" IPA, legally incorporated in 1997 as Alternative Medicine, Inc. (AMI), was formed to function within the classical gatekeeper HMO format under the same rules and regulations as any other contracted conventional allopathic IPA. The data reported herein refers to the contractual relationship between AMI as an integrative medicine IPA and the specific HMO (unless otherwise notated).

The formation of an IPA under contract with the HMO required specific contractual elements to be met according to the National Committee for Quality Assurance (NCQA). The minimum requirements for PCP network support included:

- Contracted availability of all allopathic specialists
- Contractual relationships with regional hospitals to provide inpatient access
- A minimum roster of both pediatricians and OB/GYNs exclusive to the IPA
- HMO Peer Review Committee approval of the IPA's utilization management (UM) and utilization review (UR) plan policy and procedures

As reported later in section IV, "Medical Management," each of these prerequisites was successfully addressed prior to PCP impanelment.

All primary care physicians had to pass credentialing by the Credentialing Peer Review Committee of the HMO, which is composed of MDs exclusively. For a new IPA to be impaneled, every PCP needed to successfully "pass" the credentialing criteria. A single failure would have prohibited the project from initiation. Initial analysis identified four separate and independent but related processes which needed to occur in order to provide the foundation for successful execution:

"Physician Recruitment"

Targeting that subset of physicians who would be appropriate PCPs to function in a non-pharmaceutical/non-surgical model. In this study, only Chiropractic physicians agreed to participate as PCPs.

“Credentialing Process”

Developing a credentialing process exceeding the existing NCQA requirements for CAM providers: a standardized process to quantify the performance of this subset of prospective primary care physicians according to accepted industry standards.

“Member Recruitment”

Addressing the ability to recruit potential members or patients in order to test the hypothesis that primary care Chiropractic physicians specializing in non-pharmaceutical/non-surgical approaches as their primary modality and using CAM techniques integrated with allopathic medicine would have superior clinical and cost outcomes compared to PCPs utilizing conventional medicine alone.

“Medical Management”

Formalizing the medical management to provide integrated care between the CAM therapies delivered by the Chiropractic physicians and other conventional medical specialists throughout the inpatient/outpatient cycle.

The following sections address the mechanics of how each element was defined and executed in order to successfully achieve the outcomes reported herein.

I. Physician Recruitment

“Non-pharmaceutical/non-surgical” physicians were defined to include those physicians who use as their primary diagnostic/treatment modalities such disciplines as: Chiropractic manipulation, osteopathic manipulation, naturopathy, homeopathy, Traditional Chinese Medicine (TCM), acupuncture, Ayurvedic medicine, herbal medicine preference over pharmaceuticals, massage and energy healing techniques.

Under the Medical Practice Act and Managed Care Act, the State of Illinois only licenses Medical Doctors (MD), Doctors of Osteopathy (DO), and Doctors of Chiropractic (DC) as primary care physicians. Therefore, Doctors of Naturopathy (ND) and Doctors of Oriental Medicine (OMD) although licensed in other states were automatically excluded from the IPA physician network. At the project’s inception personal interviews were conducted with all categories of physicians including MDs/DOs and DCs whose style of medical practice qualified them as potential CAM-oriented PCPs. For a variety of professional, personal, political and economic reasons, only the Doctors of Chiropractic were willing to undertake the project.

All CAM-oriented MDs/DOs interviewed rejected participation for reasons including: too restrictive a reimbursement model, philosophical or political issues with managed care in general, inability to meet credentialing requirements because of lack of board certification, or independent (“lone ranger”) personality, not comfortable with third-party oversight and review.

II. Credentialing Process

Since, to our knowledge, Doctors of Chiropractic had previously never served as PCPs in a classical gatekeeper HMO model, this presented an immediate credentialing challenge. A unique credentialing process was developed to identify that subset of Doctors of Chiropractic who could successfully function as PCPs.

Each prospective PCP underwent a personal interview to review his or her treatment modalities, criterion for referrals and comfort in dealing with a primary care role. Preference was given for such qualities as broad scope of practice patterns, history of appropriate interactions with other medical specialists and demonstrated understanding of the pathophysiological basis of disease as currently understood by evidence-based western medicine. This process has now been formalized into a standardized test and is currently offered as provisional credentialing to students at the National University of Health Sciences in Lombard, Illinois as well as endorsed by the American Academy of Chiropractic Physicians (AACCP).

The credentialing process also involved an educational component, including seminars given by AMI's MD Medical Directors to review conventional medicine diagnostic and referral decision trees. Registered nurses provided the onsite component where prospective physicians and their office staff received training in Hedis compliance, OSHA compliance, and instruction in proper charting requirements. Time spent in the onsite component varied between 4 hours to 20 hours to achieve successful completion. All primary care Chiropractic physicians were held accountable to the same criteria as their MD/DO counterparts under NCQA regulations.

It is important to note the educational training of the Chiropractic physician. While similar in many regards to medical training, there is no training in surgical procedures or in the use of drugs in the management of human illness. The standard course of training is in excess of 4800 hours, with approximately one-quarter spent in the clinical setting. Coursework encompasses programs in standard diagnosis (i.e. cardiovascular diagnosis, neurological diagnosis, gastrointestinal diagnosis, genitourinary diagnosis, etc.) as well as more specifically Chiropractic programs (i.e. manipulation of the spine and extremities, physiotherapeutic modalities) and other forms of CAM (i.e. homeopathy, herbal therapy, botanical medicine, etc.)^{45,46}.

The HMO Peer Review Committee formally approved all of AMI's primary care Chiropractic physicians in the fall of 1998. AMI began patient encounters on January 1, 1999 with 16 fully credentialed primary care Chiropractic physicians. As of December 31, 2002 AMI had 30 primary care Chiropractic physicians in the HMO model.

III. Member Recruitment

The HMO under contract had an enrollment of over 600,000 members and was available only to companies with a minimum employee base of 100 enrollees. AMI's prospective members originated from open enrollment offered to the total population of the HMO. Most members obtained information about AMI from the HMO's standard primary care and specialist physician directories or their company's human resource (HR) personnel. The HMO used no marketing incentives to attract potential patient enrollees to the alternative medicine IPA. Like all classical HMOs, there was no exclusion of patients having pre-existing illnesses.

In the first month of operation, January 1, 1999 AMI's HMO had an enrollment of 37 members. Enrollment as of December 31, 2002 was 649 members. Because "marketing" had been by "word of mouth," growth in IPA enrollment was steady but slow. IPA enrollment measured in "member months (mm)" per calendar year grew from 1,726 mm (calendar year 1999) to 4,987 mm (calendar year 2000) to 6,932 mm (calendar year 2001) and to 8,098 mm (calendar year 2002). In total, 21,743 mm of data were analyzed. This standard managed care "unit" is calculated by multiplying each unique member by the number of months enrolled within the IPA during a calendar year.

The HMO calculates the ratio of new member "transfer in" vs. "transfer out" for each IPA on a monthly basis. AMI's range for "transfer in" lies between 3.43% and 5.53% and "transfer out" between 2.83% and 3.50%. The higher ratio of transfer "in" vs. "out" correlates with the observed growth in member enrollment.

IV. Medical Management

The intention was to provide members with the best treatment that both Chiropractic, using a variety of CAM techniques, and conventional modern medicine had to offer. All of the AMI primary care Chiropractic physicians focused primarily on the assessment and evaluation of all risk factors whether they were related to diet/nutrition, exercise, postural/structural problems, behavioral/emotional problems, physiological disease or the need for improved stress management. Similar to the role allopathic PCPs assume in a conventional medical IPA, all examinations, treatments and procedures that occurred within the offices of the primary care Chiropractic physicians were at the discretion of the PCP. The number of recommended visits,

the choice of appropriate treatments, and ancillary modalities utilized did not require approval from the IPA M.D. medical directors. All ancillary testing and treatment outside the personal office of the primary care Chiropractic physician was subject to M.D. medical director approval to benefit from the enhanced experience of allopathic physicians in dealing with more complex and varied disease states.

Two outpatient-oriented and one inpatient-oriented MD Medical Directors were available 24 hours a day, 7 days per week to provide consultation and co-management by phone or facsimile as required according to the complexity of the patient's presentation. Over 3000 medical specialists and 18 hospitals (including university based) were under contract by AMI as part of the IPA to provide integrated care as appropriate to medical necessity. Ongoing telephonic and/or facsimile consultation and co-management between the PCPs and the MD Medical Directors occurred daily.

In general, primary care Chiropractic physicians practiced what they do best: non-pharmaceutical/non-surgical prevention. When and if acute life threatening disease or advanced disease management required inpatient status or conventional modern medicine, the PCP delegated his/her authority to the attending medical physician consulted. A registered nurse specializing in utilization management (UM) and utilization review (UR) coordinated continuity of care between the inpatient and outpatient cycle.

By design, AMI's PCPs had a higher number of encounters initially to correct structural dysfunctions and provide re-education in lifestyle choices that left unchanged may manifest into

more serious disease states. It was not atypical for new AMI members to have PCP encounters at an average of twice per month. This is in contrast to conventional medical IPAs wherein the majority of members have PCP encounters on a “crisis-only” basis.

AMI’s “New Member Welcome” letter informed the patient that it was IPA policy to have a mandatory initial visit with their PCP within the first 3 months of enrollment. These frequent education-oriented encounters combined with hands-on healing were believed to forge a strong doctor/patient relationship. The PCP then became the “trusted guide” and assisted the patient with the required lifestyle changes or gave professional advice on the many and varied uses of CAM. Many modalities of CAM remain unregulated and are most safely and effectively utilized when supervised by a licensed physician truly knowledgeable from extended training in CAM.

The Chiropractic PCPs also utilized non-physician (CAM) providers. These providers were licensed and/or credentialed in various CAM therapies such as massage, acupuncture, cranial sacral therapy and stress management techniques including meditation, yoga and energy balancing as well as more traditional cognitive therapy. It is important to note that the Chiropractic physicians included in this study utilized all the modalities noted above and not just the Chiropractic adjustment as a sole therapeutic intervention.

It was anticipated that this increased intensity in prevention-oriented encounters and concomitant co-management with AMI’s M.D. medical directors would reduce the utilization of high cost, high technology conventional medicine downstream.

Member Populations: AMI vs. Nonrandomized Matched Comparison Groups

In this section, Tables I through III compare various aspects of the AMI membership vs. two nonrandomized matched Comparison Groups. Both comparison groups represent separate conventional IPA enrollment within the same commercial HMO product, in the same geographic region and during the same time frame as AMI's data.

AMI Patient Population Demographics vs. Comparisons

While the comparison groups' demographics have been matched as much as possible to remove any underlying bias, certain dissimilarities exist. "Children," defined as member enrollment under the age of 20, represent a smaller population percentage in the AMI program compared to the comparison groups': 11.9% (AMI) vs. 32.8% (Comparison Group I) and 19.0% (Comparison Group II). The smaller percentage of children enrolled is not accidental. Chiropractic physicians are unable to legally administer childhood immunizations because of limitations in the scope of practice of their licensure. While AMI does not prohibit enrollment for children under 10, it is not encouraged.

Statistical analysis also reveals a slightly decreased average age of adult members in the AMI population (39.5 years) compared to Comparison Groups I (41.3 years) and II (40.3 years).

While this slight average age discrepancy certainly favors increased cost expenditures in the comparison groups, this may be offset by the fact that AMI has a greater percentage enrollment of females compared to males. The actuarial department of the HMO predicts more than a 50% greater utilization within the IPA by female versus male members. The sex distribution of AMI

membership is 61.6% females and 38.4% males. By contrast, Comparison Group I had 58.9% females and 41.1% males; Comparison Group II had 59.1% females and 40.9% males.

The HMO forwarded age/sex distribution data to AMI in the form of monthly eligibility lists. Comparison group data was forwarded to the authors from the conventional IPAs after receiving their individualized data via from the HMO.

AMI Patient Population Disease Profile

AMI's HMO membership, as reported herein, represented a unique population dissimilar from previously published literature of disease states commonly seen by chiropractors⁴⁷.

Chiropractors primarily care for patients with complaints of musculoskeletal origins or headaches. As AMI was the first managed care program to utilize chiropractors in a PCP role, it was not surprising that membership included a wide range of disease states not seen in the typical Chiropractic office, as illustrated in Table I.

When analyzing IPA data, diagnostic classification was assigned to individual patients based on PCP encounter data, specialist encounter data, referral activity and pharmaceutical usage. When multiple ICD-9 codes were listed on encounter data, the diagnosis requiring the higher expenditure for workup or treatment was chosen as the primary classification. If the presence of prominent severe co-morbidity such as hypertensive cardiac disease, diabetes mellitus and bipolar disorder were all prominent in a patient's encounter data, then the patient received 3 separate and distinct classifications. This explains why 491 unique patients in the year 2000 received 522 disease classifications (Table I).

The diagnostic category of “wellness” referenced in Tables I - III was defined as: 1) members having patient encounters but not receiving ICD-9 codes (these patients may have been symptomatic but received Chiropractic codes for subluxation/dysfunction by their PCPs), 2) members having encounters for non-symptomatic screening test only, or 3) members having no encounters within a given calendar year.

The category “other medical” listed in Table I (11.7% of AMI’s population) encompassed a wide range of diseases affecting 61 patients. These diseases included (listed in order of frequency), but were not limited to the following: neurological disorders, abdominal pain, dermatological disorders, prostate disease, adrenal cortical insufficiency, chronic fatigue syndrome, cystitis, esophageal reflux, multiple sclerosis, tinnitus, TMJ, and HIV.

As doctors of Chiropractic had not previously functioned as PCPs, the congruence of their diagnoses when compared to conventional PCPs when reporting on a HFCA 1500 encounter form was unknown. When PCP diagnostic coding data was cross-correlated with both specialist referral data and pharmaceutical usage, agreement was found between the conventional medical specialist and the Chiropractic PCP 93.1 % of the time. When the diagnosis necessitated a treatment that required the use of pharmaceuticals or surgery, then an appropriate referral was made to a conventional medical specialist.

ICD-9 Profile of Nonrandomized Matched Medical Comparison Groups I and II -

In this section, Tables II and III reflect membership breakdown by ICD-9 diagnostic coding percentage comparing AMI's membership to the membership of Comparison Groups I and II. Both comparison groups represent conventional IPA enrollment for the same commercial HMO product in the same geographic region during the same time frame as AMI's data. A blinded independent contractor with previous employment in the medical records department of a local hospital analyzed ICD-9 coding data compiling the disease profiles between AMI's membership and Comparison Group I's membership.

Previously published literature indicates that users of CAM modalities are not necessarily the "worried well," and may actually represent an adverse selection of patients who are "medical failures" in the traditional medical system^{48,49}. The prevalence of active disease in the AMI population as shown in Tables II and III is consistent with earlier reports of this phenomena.

The fact that potentially life-threatening disease states, such as cardiac disease, hypertension and diabetes had higher enrollment in conventional medicine IPAs was not surprising. The similar percentage enrollment of patients with asthma and neoplastic disease between conventional and integrative medicine IPAs was somewhat surprising. The large enrollment disparity among patients with upper respiratory infections (URI), as previously mentioned, reflects the small percentage of AMI's enrollment under 10 years of age.

A comparison of smoker prevalence among the AMI population, the HMO population and the general state population further demonstrates possible adverse selection in the AMI population. Member satisfaction surveys, randomly distributed by stratified random selection to between 35,000 to 45,000 HMO members annually elicited a response rate which varied between 25% to 30%. These surveys revealed a variance in the AMI population when measuring for smoker prevalence rate.

In calendar year 2001, the AMI membership showed its highest rate of smoker prevalence: 34.9% vs. the HMO population rate of 18.0% vs. the Illinois general population of 22.3%⁵⁰.

In calendar year 2003, by contrast, AMI membership had its lowest smoker prevalence rate of 13.3% vs. the HMO population rate of 16.3%. We assume the large variance from year to year was secondary to the relatively low membership response rates elicited by the survey.

Data Analysis

AMI's outcomes data is based on claims incurred. Data were collected in parallel by the HMO and Independent Health Resources (IHR), which functions as AMI's third-party administrator (TPA). The HMO specifically analyzed all inpatient costs, outpatient facility costs and pharmaceutical usage. AMI, via its TPA, analyzed all inpatient and outpatient professional encounters and utilization, as well as outpatient laboratory. The HMO reported all utilization back to AMI on a six-month delay to allow for the reporting of all claims during the experience period. This reporting method produced actual claims, removing the potential inaccuracies of claims incurred but not reported (IBNR).

Data Reporting

The HMO prepared quarterly reports to AMI on such managed care benchmarks as:

- Hospital admissions per 1000 members
- Total hospital days per 1000 members
- Outpatient surgical cases and procedures per 1000 member
- Average Length Of Stay
- Pharmaceutical utilization and cost per member/per month

These statistical benchmarks were reported as a comparison between the performance of AMI as an IPA and the HMO network as a whole. Because of the HMO's proprietary concerns regarding their network's unique data points, AMI's outcomes are reported as percentage comparisons to HMO outcomes.

Results

Outcomes: Clinical

These data points are based on the HMO's corroborated data for the 4 calendar years 1999, 2000, 2001 and 2002. AMI's encounter data represents 21,743 member months over this 4-year period. The traditional managed care benchmarks depicted in Table IV illustrate AMI's apparent superior clinical outcomes compared to conventional IPA performance over the same time frame.

AMI's outcomes are reported as "percentage utilization" and "percentage reduction" versus the HMO network as a whole. "Percentage utilization" is based on actual claims data after a 6-month runoff comparing AMI's utilization of key benchmarks versus the HMO network as a whole. "Percentage reduction" reflects the mathematical complement of AMI's utilization percentages using the HMO networks outcomes as the normative value of 100%.

Traditional "P" values of statistical significance could not be reported. Insurance actuaries do not currently have data points for "variance" and "mean" on groups of similar size and demographics. Only aggregate data (the HMO normative network performance) representing groups of all sizes and demographics were available.

Calendar year 2000 data on hospital admission days (Table V) obtained from the Illinois Department of Insurance similarly reflect improved AMI outcomes compared to all the major HMOs in the Chicago metro area.

The referral pattern of AMI's PCPs compares favorably with historical referral patterns generated by traditional allopathic IPAs utilizing internists, pediatricians or OB/GYNs as PCPs. As shown in Table VI, the strategy of co-management resulted in only 40% of the AMI membership requiring an allopathic specialist referral in the calendar year 2000. In other words, during the year 2000, 60% of the patients were managed solely by their primary care Chiropractic physicians.

Referral data analysis annualized for the year 2001 shows AMI primary care Chiropractic physicians generated 1 referral per 33 patient encounters (1:33 ratio). This is in contrast to data generated from Comparison Group II illustrating that conventional medicine PCPs generate 1 referral per 3 patient encounters (1:3 ratio). This referral pattern was consistent with our prediction that an increase in CAM oriented PCP encounters initially would result in less utilization of conventional medicine downstream.

In addition to the clinical outcomes referenced in Table VI, measures of Quality Care were benchmarked by randomized patient satisfaction surveys and an annual audit of all UM/UR Committee documents by the HMO nursing administrators. Annually the HMO independently surveyed by "stratified random selection" over 45,000 patients. Response rates were between 25% - 30% annually. The HMO required a minimum score for patient satisfaction to be between 80-90% depending on the calendar year. AMI member satisfaction scores for the first 4 years were 100%, 89%, 91% and 90% respectively. Analysis of HMO member satisfaction surveys demonstrates the AMI members consistently rated their experience with AMI above the HMO network normative average.

Annual audit scores measuring IPA compliance with Utilization Management Adherence/ Utilization Review Activity written policy and procedures conducted by HMO onsite nurse auditors also were above the HMO network normative values. AMI's annual audit scores for medical administration and medical management were between 97% and 100% in each category. The HMO minimum required score for IPA performance is 90%.

Outcomes: Cost

AMI also received an annual age/sex adjusted risk pool analysis of its members by the HMO's actuarial department. Derived from this risk pool analysis was a hypothetical budget of predicted expenditures excluding pharmaceuticals for AMI's actual membership defined as the "utilization management fund" (UM fund). This budget was calculated in "target usage units" that have an assigned dollar equivalency. IPA actual performance was then calculated against IPA-predicted performance. AMI's utilization management fund cost savings (below predicted budget), were 66.7%, 88.1%, 57.1% and 69.3% for the calendar years 1999, 2000, 2001 and 2002 respectively.

It is believed that the improvement in cost effectiveness between year 1 (1999) and year 2 (2000) occurred primarily due to an innovative mental health initiative. In calendar year 1999 (AMI's first year) 33% of the hospital days were categorized as "mental health." Beginning in calendar year 2000 (AMI's second year), a quality initiative targeting stress management techniques was introduced to impact the high percentage of mental health admissions.

In the subsequent 3 years following this initiative, mental health admissions have accounted for less than 2% of all hospital days utilized. This protocol relied heavily on “mind/body” techniques such as cranial sacral therapy and energy balancing as well as more traditional cognitive therapy.

Discussion

Conventional medical researchers historically have favored the tradition of western scientific reductionism. Their preferred methodology has been for double-blinded randomized controlled trials (RCT's) focused on a small number of independent interventional variables, or methodology to isolate mechanisms-of-action. This papers methodology, by contrast, is a nonrandomized longitudinal population study comparing and contrasting both clinical and cost outcomes among similar populations enrolled in the same insurance product, for the same time frame and geography.

Despite academic medicines avowed preference for double-blinded RCT's, recently published literature indicates that for a given subject most often observational studies and RCT's closely mirror each other's results. This fact reminds us that credible, valid and useful information can be gleaned from many research methodologies, and that each type of methodology has by its very design, inherent strengths and weaknesses.

The strengths of this papers methodology are numerous: 1) Study length – 4 years; 2) Cost and clinical data reported “at arms length” by the actuarial department of the HMO to the IPA; 3) Availability of matched comparison groups for blinded analysis of membership population for ICD-9 comparisons; 4) Availability of randomized patient surveys generated by the HMO to analyze both membership satisfaction with ongoing treatment and preexisting risk factors, such as lifestyle behaviors (tobacco usage); 5) Availability of corroborating data, such as pharmaceutical usage and specialist consultations to cross check the accuracy of membership ICD-9 population profiles; and 6) Patient-oriented medical management whereby a variety of

CAM therapies were individualized for each patient in the “real life” setting of a metro-wide IPA, doing business as a “clinic without walls.”

Of course, this paper's methodology also suffers from inherent weaknesses: 1) The relatively limited enrollment of AMI's membership population vs. the matched comparison groups; 2) The inability to determine the exact effect of membership transfer “in and out” on the cost and clinical outcomes; 3) Lack of uniformity in disease-specific treatment protocols utilized among all AMI's physicians; 4) No randomization of comparative IPA memberships; and 5) Inability to perform standardized statistical probability analysis due to industry non-availability of required actuarial data.

So.... at the end of the day, where does this leave us? Have we derived valid and credible knowledge, which is useful? At the very least, this paper for the first time has demonstrated that a select group of Chiropractic physicians successfully functioned in both a safe and effective manner as PCP's in a classical gatekeeper HMO model. Second, it has demonstrated that these same Chiropractic physicians were capable of initiating and coordinating care for patients with a broad spectrum of disease states, representing a wider variety of diagnostic presentations than is commonly seen in most Chiropractic offices. Third, the magnitude of improvement, in both clinical and cost outcomes compared to normative values, is so large that it is difficult to dismiss as purely coincidental to population bias and nothing more.

While admittedly the data is not definitive because of all of the methodological concerns enumerated, this paper seems to demonstrate, for the first time, the potential superiority of integrating a non-pharmaceutical/non-surgically oriented gatekeeper or entry point with our

already existing conventional healthcare system. Why should this change in PCP orientation make seemingly such a profound impact on outcomes?

One could argue that the main focus of the primary care physician, of whatever licensure, should be to look at all evidence-based risk factors and seek to coordinate their reduction. Besides the obvious attention to the HEDIS requirements, PCP's need to be focused and involved in the re-education of patients lifestyle choices such as diet, exercise, nutrition, supplementation, correction of posture and stress management issues. Lifestyle re-education, oriented towards prevention and wellness, may be better addressed by PCP's with an unconventional medical orientation, as opposed to conventional medical physicians who have been educated and focus primarily on disease-state-management.

The AMI experience seems to indicate that a non-pharmaceutical/non-surgical orientation can reduce overall healthcare costs significantly and yet deliver high quality care, especially for the spectrum of chronic conditions seen in the AMI population. These results have been achieved not by decreasing or denying access to care but, rather, by increasing the frequency of PCP prevention-oriented encounters. Recently published literature also suggests patient preference and increased satisfaction with integrative therapies for chronic disease states. In the article by Eisenberg et. al, comparing patients subjective perception as to the relative value of conventional care vs. CAM therapies, in only 3 of 10 therapies was conventional medicine perceived as superior to CAM therapies. The 3 disease states scoring higher for conventional medicine were high blood pressure, lung conditions and digestive conditions. By contrast, back conditions, allergies, fatigue, arthritis, headaches, neck conditions, and strains and sprains were perceived

better treated by CAM therapies⁵¹⁻⁵³. AMI's higher percentage of enrollment compared to comparison group enrollment for members with chronic illnesses involving orthopedics, mental health, chronic sinus and allergy, GI problems and headaches is consistent with this pattern.

Limitations

This paper reports the outcomes of a small population, encompassing 21,743 member months over a 4-year period. The magnitude of the clinical outcomes and cost savings documented herein may not remain constant when the AMI model is utilized on larger and more diverse populations. Furthermore, the exact net effect of member “transfers” on AMI’s reported outcomes is unknown. Nor is it known how the population shift from acute disease states (diabetes, cardiac and hypertensive disease) to predominantly chronic disease states (orthopedics, mental health, sinus, allergy, headache, GI) affects the predicted cost burden of AMI’s population versus the comparison groups. The original actuarial assumptions for predicted cost burden were based on demographics more closely approximating the comparison groups, as opposed to the AMI membership.

As AMI’s future enrollment increases, health care actuaries should be able to recalculate “predicted target unit cost” based on a more accurate assessment of AMI’s specific membership demographics and disease profile. This would provide a more accurate account of the true percentage reductions in both clinical and cost outcomes.

Cost tradeoffs, such as analyzing the potential cost of coverage for non-prescriptive treatments such as herbs, supplements or homeopathic remedies were not examined. These items remained still out-of-pocket expenses for AMI members and, as such, were not accounted for in data collection. Providing a mechanism for coverage of these items on a prescriptive basis (similar to a pharmaceutical card) would improve both access and compliance with the program by reducing

the personal financial outlay incurred by the enrolled member. Seemingly, the magnitude of cost savings witnessed by the AMI experience should permit the allocation of this extended benefit.

Conclusion

In conclusion, AMI's integrative medicine IPA represents a new model in the delivery of managed care. This unique model has demonstrated promising clinical and cost outcomes by the integration of complementary alternative medicine with conventional medicine in a defined program encompassing physician selection, medical management, and scientific accountability. AMI believes this model to be replicable on a much larger scale and is currently implementing different programs, such as PPO, POS, and Workers' Compensation to new geographies. AMI's HMO outcomes reported herein were the results of an initial prototype still in evolution. The performance of physicians with other licensures, such as Doctors of Naturopathy and Oriental Medicine, as well as MD's and DO's who are non-pharmaceutically oriented needs to be studied in this context as well.

The traditional argument against coverage for prevention-oriented medicine is that it will not reap immediate financial benefits; that employee or insurance turnover is too high to wait for an extended turnaround time. The AMI experience suggests that cost savings may occur in the first calendar year of operations.

The magnitude of improvement in both clinical outcomes and cost savings documented herein may not remain constant when the AMI model is utilized on larger and more diverse populations. However, even a small percentage of the AMI outcomes would still have significant implications, given a 1.3 trillion dollar national health care budget. At such a high price, AMI's initial results should warrant additional funding for a larger and better controlled replication of these findings.

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Table I
Diagnostic Profile of AMI's HMO Population Year 2000
(522 members with Diagnoses)

DIAGNOSES	Diagnoses by Percentage	Diagnoses by Members
Wellness	28.5%	149
Orthopedic	23.5%	123
Other Medical	11.7%	61
Mental Health*	8.1%	43
Gynecological	6.7%	35
Sinus/Allergy	6.0%	31
Cardiac/Hypertension	4.6%	24
Headaches (all variations)	2.7%	14
Neoplastic	1.5%	8
URI	1.5%	8
Asthma	1.4%	7
Gastrointestinal	1.3%	7
Thyroid disease	1.2%	6
Diabetes	1.2%	6
	100%	522
31 severely ill patients (multiple ICD-9 co-morbidities)		

*Mental health defined as those patients requiring a referral to a mental health specialist.

**Table II
Comparison of “well” members AMI vs. Comparison Groups I and II**

IPA	Members enrolled	Members with no or non ICD-9 encounters	Percentage of members coded as “wellness”	Percentage of members coded for active disease
AMI	522	149	28.5%	71.5%
Control Group I	7549	2618	34.7%	65.3%
Control Group II	7723	3206	42.0%	58.0%

**Table III
Comparison Of ICD-9 Diagnostic Profile By Percentage Of Member Enrollment AMI vs. Comparison Group I**

Diagnosis	AMI %	Comparison Group I
Wellness	28.5%	34.7%
Orthopedic	23.5%	8.0%
Other medical	11.7%	17.0%
Mental health	8.1%	1.3%
Gyne (non OB)	6.7%	9.4%
Sinus/chronic allergy	6.0%	2.8%
Cardiac/hypertension	4.6%	9.4%
Headache (all variants)	2.7%	0.7%
Neoplastic (all)	1.5%	1.1%
URI	1.5%	10.4%
Asthma	1.4%	1.3%
GI	1.3%	0.9%
Diabetes	1.2%	3.4%
Thyroid disease (all)	1.2%	1.4%

**Table IV
AMI Outcomes Comparison to HMO Network Data (1999-2002)***

<u>Hospital Based Data</u>	<u>AMI Percentage Utilization vs. HMO</u>	<u>AMI Percentage Reduction vs. HMO</u>
Hospital admissions/1000	57.0%	43.0%
Hospital days/1000	41.6%	58.4%
Average length of stay	76.2%	23.8%
<u>Outpatient Based Data</u>		
Outpatient surgical cases/1000	56.8%	43.2%
Pharmaceutical usage (cost)	48.2%	51.8%

*OB admissions excluded from comparison percentages

Table V
Calendar Year 2000 Hospital Days Incurred Among
Major Illinois Managed Care Organizations (MCO) vs. AMI

Managed Care Entity	Total Member Months	Total Hospital Days Incurred per 1,000 m/m	AMI Percentage Utilization	AMI Percentage Reductions
HMO Illinois	7,537,362	344.85	33.3%	66.7%
Personal Care Ins. Co. of Illinois	787,853	320.02	35.9%	64.1%
Prudential Health Care Plan	269,268	285.38	40.3%	59.7%
United Healthcare of the Midwest	361,437	236.75	48.6%	51.4%
CIGNA Healthcare of IL	143,236	201.00	57.2%	42.8%
Aetna US Healthcare of IL	1,664,525	177.64	64.7%	35.3%
Humana Health Plan, Inc.	3,536,085	170.94	67.3%	32.7%
<hr/>				
AMI 3 -year cumulative	13,645	115.0		

Table VI
Analysis of Referral Patterns on AMI HMO Population
Calendar Year 2000

1. Average number of members during 2000 = (4,987 member months / 12)	416
2. Total number of referrals	330
3. Total number of unique patients requiring a referral	167
4. Percentage of population requiring referral to allopathic specialist = (167/416)	40%
5. Percentage of population managed by Chiropractic Primary Care Physicians (PCP) without allopathic referral = 100 – (4)	60%