EDUCATION

Teaching evidence-based integrative medicine: description of a model programme

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Abstract: Complementary and alternative medicine is of great importance to the American public, yet often resisted by a conventional medical community unschooled in its methods. To provide the public with safe and unprejudiced access to all modes of health care, the integration of conventional and complementary care is needed. The Integrative Medicine Center at Griffin Hospital (Derby, Connecticut, USA) has implemented a unique model of integrative care in which allopathic and naturopathic providers base treatment recommendations on consensus. The centre is used as a training site for allopathic students and naturopathic residents; and, in conjunction with Yale's Prevention Research Center, also provides training in research methods. Since its inception in 2000, three naturopathic residents have graduated and high patient satisfaction has been consistently achieved. The model described has the potential to advance the delivery of integrative care, train naturopathic practitioners in evidence-based methods, and create collaboration between allopathic and alternative providers.

Keywords: alternative medicine, integrative medicine, medical education, naturopathic medicine, patient-centred care

Introduction

The emergence of integrative medicine as a clinical delivery model has resulted, in part, from the popularity of complementary and alternative medicine (CAM) (Eisenberg et al 1998), as well as limited and, by most accounts, inadequate, communication between patients and their conventionally trained providers about alternative care. While an increasing percentage of people seek CAM concurrently with treatment by an allopathic physician (a rise from 8.3% in 1990 to 13.7% in 1997) (Eisenberg et al 1998), more than 70% of patients who seek alternative care do not reveal their choice to their conventional physicians (Eisenberg et al 1993; Kessler et al 2001). This reticence relates largely to the widespread skepticism of conventionally trained health care professionals regarding the utility, validity and evidence underlying CAM practices (Angell and Kassirer 1998; Talalay 2001).

As the public's desire for CAM continues to grow, and practitioner reticence about the evidence base supporting CAM use persists, establishing an evidence-based approach to the teaching and delivery of an integrative medicine model becomes imperative. What is lacking to date is a replicable model that fosters the delivery of integrative care and the meaningful interaction of allopathic and CAM trainees so that each learns about, and from, the other. The Integrative Medicine Center, developed in Connecticut, provides an evidence-based model that seeks to create common ground and demonstrate the capacity for consensus and collaboration. It has served as a residency-training site for naturopathic physicians and a site of training for a variety of health care students and residents from Yale and other institutions, since 2000. The model, and the experience with it to date, are described.

Description of model

The Integrative Medicine Center (IMC) at Griffin Hospital (Derby, Connecticut, USA) was founded in January, 2000. Griffin Hospital is a Yale-affiliated acute care community hospital, and is headquarters to Planetree (Planetree 2002), an organisation devoted to patient-centred care. From its inception, the IMC was planned to be a site of clinical care, medical education and research; a component predicated on the close working relationship between the IMC and the Yale-Griffin Prevention Research Center (PRC). The PRC is a clinical research facility funded by the Centers for Disease Control and Prevention and is devoted to chronic disease prevention. The IMC and PRC share a director and a number of staff.

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Clinical care

The delivery of clinical care at the IMC was designed to foster a consensus-based approach to medical decision making while providing an optimal hands-on learning environment to residents. The structure of a standard encounter is shown in Figure 1. During an IMC visit, two patients undergo a 40-minute evaluation by an allopathic resident physician or physician associate and a 40-minute evaluation by a naturopathic resident physician sequentially, with a 5–10 minute exchange in between. At the exchange, each practitioner presents their case to the other and to the supervising clinicians (one experienced in internal medicine/preventive medicine and the other, naturopathic medicine. Following the exchange, the clinicians switch patients, directing their history and exam based, in part, on what they learned from their colleague. Psychosocial, cultural, familial and spiritual influences are explored in depth by one or both providers.

After both evaluations have been completed, the IMC clinical team convenes for a consensus conference during which individualised recommendations are generated. The conference adheres to an explicit set of goals, and invokes a novel and educational construct to facilitate decisions. The goals are to: (1) assess the adequacy of care the patient has received to date; (2) determine whether the primary need at present is for diagnosis, treatment or both; (3) explore allopathic and alternative treatment options; and (4) generate specific recommendations for conventional treatment, CAM treatment or both. The construct that serves to guide the consensus conferences is the *evidence hierarchy*, shown in Table 1. This concept was developed as a result of working in the IMC model, and recognising that evidence, while of constant importance, is in practice a fluid concept and often runs out long before the needs of patients. The evidence hierarchy represents evidence to support a particular clinical recommendation as a continuous rather than dichotomous construct. The overall priority, or rank, of a given approach is derived from the interaction of the five characteristics under consideration (effectiveness, safety, evidence, alternatives of comparable utility and confluence with patient preference). A practice that is known to be both highly effective and safe based on high-quality evidence, for which there are no good alternative therapies, and that is compatible with patient preference would be a top priority choice. At the opposite extreme would be a therapy not known to be safe or effective, for which alternatives are numerous. The range in-between represents a semi-structured approach to addressing patient need that extends beyond the range of evidence from clinical trials (Table 1).

Often, the naturopathic resident or student on rotation is asked to search the literature for evidence pertaining to therapies discussed in the conference. The results of these searches are used as the basis for exercises in evidence-based practice at subsequent sessions.

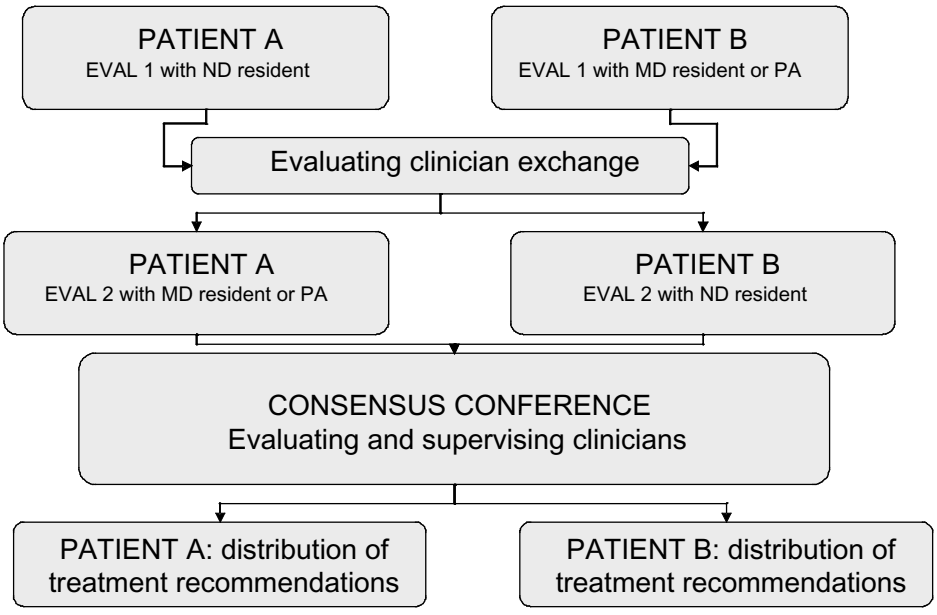

Figure 1 Integrative Medicine Center evaluation process. Abbreviations: ND, naturopathic; MD, medical; PA, physician associate.

Table 1 Evidence hierarchy. Characteristics that support the selection of a particular therapy or approach appear at the top of each cell in the table, with their opposite shown at the bottom of the cell. The overall priority, or rank, of a given approach is derived from the interaction of the five characteristics under consideration.

Effectiveness	*Safety*	*Evidence*	*Alternatives of comparable utility*	*Confluent with patient preference*	*Rank*
High	High	Strong	Absent	Yes	High
↕	↕	↕	↕	↕	↕
Low	Low	Weak/Absent	Numerous	No	Low

Once there is consensus among the practitioners, treatment recommendations are reviewed with the patient and/or family. Generally, patient beliefs and preferences have been addressed in advance and, thus, the recommendations delivered are consistent with patient choice. However, the IMC team cannot always endorse patient preference. For example, some patients are seen who disavow all use of conventional medication. Under such circumstances, the team invokes the evidence hierarchy and determines whether the patient view can be embraced. If not, the team conveys its opinion unambiguously. Often, it is unprecedented and of great impact for a patient to receive advice to use a conventional medication from a naturopathic physician, or advice to try botanical therapy from an internist. Treatment recommendations may include any of the wide array of services offered at the IMC, including, but not limited to, pharmacotherapy, herbal remedies, acupuncture and intravenous micronutrient therapy. Recommendations may also include referral to services offered by members of the CAM provider panel, representing credentialed practitioners of diverse CAM modalities throughout Connecticut, or by allopathic specialists. Such services may include chiropractic manipulation, psychotherapeutic interventions, therapeutic massage and advanced acupuncture techniques. A representative sample of therapies recommended for particular conditions is shown in Table 2.

To fulfill the IMC commitment to enhanced communication among practitioners, a detailed overview of the patient encounter is dictated, transcribed and mailed out within one week of the visit. Copies are sent to the

Table 2 Therapies for conditions. A representative sample of therapies recommended for particular conditions at the Integrative Medicine Center.

	Chief complaint		
Therapies	*Hypertension*	*Fibromyalgia*	*Seasonal allergies*
Lifestyle	DASH diet Exercise Stress reduction	Elimination diet Stress reduction Exercise counselling	Elimination diet
Supplement	Multivitamin Essential fatty acids Coenzyme Q10	Multivitamin Magnesium Essential fatty acids	Multivitamin Essential fatty acids Quercetin
Botanical	Hawthorn Leonurus cardica	–	Slippery Elm Nettle Sambucus/Larix
Homeopathy	–	–	–
Diagnostic testing	Lab work	Sleep study Lab work	–
Modality	–	Intravenous micronutrient therapy Acupuncture Manipulation	Nasal lavage Acupuncture
Conventional medication	Antihypertensive as indicated	Non-steroidal anti-inflammatory COX II inhibitor	H-1 blocker

patient and, with their consent, to all practitioners actively involved in their pertinent care.

Patients are seen for at least one follow-up appointment to review health status and adjust recommendations as necessary, and to further assist in coordination of care with additional follow-ups scheduled as needed. This visit typically follows the initial evaluation by 4–6 weeks, but this is individually tailored. Additionally, patients are encouraged to call or email to address questions that arise in the interim. Questions are circulated to the IMC team and same-day responses are generally provided.

Medical education

The IMC has collaborated with the University of Bridgeport College of Naturopathic Medicine (UBCNM) to create an accredited residency in integrative medicine. This one-year position is open to graduates of accredited four-year naturopathic medical colleges. The resident's time is divided as follows: clinical rotations with medical doctor/doctor of osteopathy (MD/DO) private practices, 20%; UBCNM's outpatient naturopathic teaching clinic and satellite community clinics, 50%; the IMC, 20%; as well as time spent as a research assistant at the Yale-Griffin PRC, 10%.

The current residency programme accommodates one resident per year. It offers unique training opportunities that include, but are not limited to, hospital-based education; research training including protocol development and grant writing, clinical training by allopathic, osteopathic and naturopathic doctors in a variety of settings; and opportunities for speaking at local and national conferences. Evaluation of the resident's performance in various aspects of their training is consistent with guidelines generated by the National College of Naturopathic Medicine (National College of Naturopathic Medicine 2002).

In addition to training naturopathic residents, the IMC offers experiential training to a variety of health care students. Block rotations have been provided to medical and nursing students from Yale University; preventive medicine residents in training at Griffin Hospital; students at UBCNM; and students from Bastyr University College of Naturopathic Medicine. All students participate (actively or as passive observers) in the clinical care rendered at the IMC and in the consensus conferences that ensue.

Research

The development of the IMC has resulted in an expanding body of research related to CAM at Yale's PRC. In part, as a result of its link to the IMC, the PRC has been funded by the Centers for Disease Control and Prevention (CDC) to conduct a two-year expansive, systematic review of evidence underlying CAM practices (Katz et al 2003). The IMC began offering intravenous micronutrient therapy for fibromyalgia in 2001, but at the same time identified the underlying evidence base to be deficient. With considerable involvement of the naturopathic resident, a protocol was developed, submitted to the National Institutes of Health (NIH), and has been funded (1 R21 AT 01332-01: intravenous micronutrient therapy (IVMT) for fibromyalgia syndrome). Trials are ongoing, examining yoga as adjuvant therapy for asthma; the utility of constitutional homeopathy for attention deficit disorder; the value of massage therapy for osteoarthritis of the knees; and metta meditation and massage therapy effects on quality of life in end-stage AIDS (CDC, U48/CCU115802, optimising the practice-based assessment of CAM; NIH/NINR, 1 R 21 NR08093-01, MIEL, meditation and massage in end of life). In all cases, opportunities have been provided for active involvement by trainees at the IMC.

Experience to date

The training opportunity at the IMC has proved extremely attractive to graduating naturopaths. A total of 45 applications have been received over the past four years for the single position offered yearly. Three naturopathic residents have completed the integrative medicine residency, and a fourth has initiated training. The residents have contributed to two NIH grant applications of CAM interventions (1 R21 AT 01332-01, IVMT for fibromyalgia syndrome; and 1 R 21 NR08093-01, meditation and massage in end of life) and a CDC-funded systematic review of the CAM literature (Katz et al 2003) as noted above. The naturopathic residents have also made presentations to nursing, pharmacy and medical staff, as well as civic groups and lay audiences throughout Connecticut on a number of topics, including drug–herb interactions, drug–nutrient interactions and naturopathic medical modalities.

Patient satisfaction and the effectiveness of the IMC model are evaluated on a quarterly basis by patient survey. To date, the vast majority of responding patients rate their satisfaction with the IMC as a '5' on a scale of 1–5, with 90% rating the experience as 'somewhat satisfying' or 'very satisfying'. More than 85% of patients describe their IMC

experience as better than their experience with conventional medical providers.

Discussion

The integrative medicine model described breaks new ground in the delivery of clinical care and medical education. To our knowledge, the coordinated, sequential evaluation of patients by allopathic and naturopathic providers, and the culminating consensus conference, are unique to the IMC.

Although the number of medical schools in the US currently offering course work in alternative medicine is increasing (Wetzel et al 1998), less than 20% of the courses emphasise a scientific approach to the evaluation of CAM effectiveness (Brokaw et al 2002), and training opportunities for allopathic physicians and alternative medicine practitioners in integrative medicine are still limited. Of note are the Universities of Maryland, Columbia and Harvard, which offer training programmes in integrative medicine that aim to train MD/DOs to practice integrative medicine, learn and use research skills, and to be future leaders and teachers in the field.

For naturopathic physicians, opportunities for training in integrative medicine are even more limited. The Arizona Complementary and Alternative Medicine Research Training Program (ACAMRTP) at the University or Arizona, sponsored by the National Center for Complementary and Alternative Medicine, supports research fellows and short-term trainees. Other educational options for naturopaths are limited to the National Center for Naturopathic Medicine (NCNM) and to Bastyr University.

The IMC is novel in providing a model that supports the training of naturopathic and allopathic practitioners side by side, fostering professional collegiality. Integrated education allows for the development of personal qualities such as flexibility, trust, shared responsibility, accountability and decision making (Pelligrino 1972). Independent of their philosophical bases for health care, both allopathic and naturopathic providers need to have an understanding of anatomy, pathophysiology, and the indication for, and interpretation of, diagnostic studies. All providers must become proficient at history taking, especially developing rapport with patients, eliciting patients' beliefs and assumptions, and developing cultural competency. All clinicians must have an appreciation for medical economics, case management, ethics and medico-legal issues. Providers should also share an appreciation for the importance, and the limits, of medical evidence, and have the means of contributing to the evidence base (Katz et al 2001).

Perhaps the most provocative aspect of integrative care is its inevitable collision with principles of evidence-based medicine. Patients who seek alternative and integrative care tend to be those very patients for whom evidence-based, allopathic practices have proved unsatisfactory. It is widely appreciated in the medical community that outcomes research is essential for establishing and improving the scientific evidence base for medical decisions and practice (Leape et al 2002). However, the needs of patients often transcend the strict limits of evidence at any given time in the history of medicine (Katz et al 2001). Further, the best available evidence, strictly interpreted and applied, may actually be ill-suited for guiding clinical decisions (Feinstein and Horwitz 1997; Herman 1998; Tonelli and Callahan 2001). Viewed simplistically, there is a risk of evidence becoming the bars that cage medical decisions, rather than a tool in their service.

The evidence hierarchy invoked for the model of integrative care described guides clinical decision making differently. The guiding principle of the evidence hierarchy is that evidence is a continuous, non-dichotomous variable (Table 1). Patients presenting to the IMC, or seeking alternative care in general, have often exhausted the options best supported by evidence. The question they pose by their very presentation is whether they will need to explore options beyond the edge of evidence alone, or with experts along for company and guidance. The notion that reasonable interventions may be undertaken without recourse to scientific evidence per se is far from unprecedented (Leape et al 2002).

The principal limitation of the model described is its cost-effectiveness, which has not yet been thoroughly examined. There is an intrinsic cost burden in having a team of clinicians render care, rather than a single practitioner. Economies are created, however, by virtue of the relative cost-effectiveness of trainees such as residents and mid-level providers. By combining clinical care, medical education and research, the IMC is productive in various ways, further justifying attendant costs. That integrative care is potentially beneficial to third-party payers by reducing aimless selection of futile therapies is an issue that has been raised (Katz 1999), but not yet adequately investigated.

In summary, a model of integrative care has been described that uniquely blends conventional care with CAM,

research and clinical care with education, and the training of naturopathic physicians with the training of students from the various conventional medical programmes. If CAM and conventional care are both here to stay, as appears to be the case, their graceful alignment must be a priority to avoid dangerous cross-currents in the health care delivery system. Integrative medicine in the model described is the promise of a bridge across such potentially troubled waters.

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