

STATE OF THE ART
REVIEWSDaniel Redwood, DC, and
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Prevention and Health Promotion by Chiropractors

Abstract: *Chiropractic care includes a variety of minimally invasive approaches, with both treatment and prevention as essential elements of clinical practice. Although chiropractic adjustment (manipulation) is the signature therapy and best-known identifier of the profession, the practice of chiropractic involves more than manual therapeutics. In general, chiropractors seek to bring a holistic worldview to the doctor–patient encounter, seeking not only to relieve pain and restore neuromusculoskeletal function but also to support the inherent self-healing and self-regulating powers of the body. Aside from applying their diagnostic training to the evaluation of a variety of physical disorders and delivering manual adjustments and related therapeutic interventions, many chiropractors encourage patients to take an active role in restoring and maintaining health, with particular emphasis on doctor-guided self-care through exercise and nutrition. In this review, the authors summarize the peer-reviewed literature on chiropractic and prevention, describe health promotion and wellness approaches currently taught at chiropractic colleges and used in chiropractic clinical settings, discuss duration of care, emphasize the importance of interprofessional cooperation and collaboration, and address*

the hypothesis that chiropractic adjustments yield preventive effects.

Keywords: chiropractic; primary prevention; health promotion; complementary medicine; alternative medicine

When a niche in the health care ecosystem remains unfilled by medical physicians and their associated paraprofessionals, in some cases, a new profession emerges to fill

the past century, chiropractic has grown and evolved, gradually moving toward mainstream status while largely maintaining its original mission and tenets.

Preventive health care includes primary prevention (averting illness before it begins, chiefly through diet, exercise, stress management, and avoiding destructive behaviors such as smoking) and secondary prevention (detecting and treating disease in its early stages to cure it or halt its progression or efforts



Other areas where chiropractors could potentially help their patients to pursue healthier choices—most notably smoking cessation—are addressed far less frequently.



the gap. In the United States in late 19th century, the chiropractic profession arose to meet a need for alternatives to “heroic medicine,” the conventional care of the time. This reflected a pragmatic need for spine-focused manual therapeutics coupled with a paradigmatic need for a healing philosophy based on minimally invasive (nonpharmaceutical, non-surgical) methods that included a strong emphasis on preventive approaches. Over

designed to prevent recurrence of illness or injury). Historically, chiropractors have recognized the importance of both primary and secondary prevention, but implementation has been inconsistent. Although some chiropractors devote a substantial part of their clinical efforts to nutrition and/or therapeutic exercise and rehabilitation and perform various types of screenings and risk assessments, others show less interest in these topics.

DOI: 10.1177/1559827608323214. Received December 3, 2007; revised January 25, 2008; accepted January 28, 2008. From Cleveland Chiropractic College–Kansas City, Overland Park, Kansas (DR) and Cleveland Chiropractic College–Los Angeles, Los Angeles, California (GG). Address for correspondence: Daniel Redwood, DC, Associate Professor, Cleveland Chiropractic College–Kansas City, 10850 Lowell Avenue, Overland Park, KS 66210; e-mail: dan.redwood@cleveland.edu.

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Similarly, although the biopsychosocial model of health is now broadly accepted and evidence-based prevention data on problems such as smoking cessation, overexposure to sunlight, and unprotected sexual activity are widely available, some chiropractors counsel patients on such issues, whereas others address them rarely or not at all.

At the heart of these choices by individual practitioners lie fundamental questions concerning the role of the chiropractor in the health care system. Within the profession, there is a broad range of opinion and practice. At one end of the spectrum are those who conceive their role as primary care physicians with a neuromusculoskeletal focus. In a study of clinical and cost utilization data, Sarnat and Winterstein¹ and Sarnat et al² documented significantly improved outcomes across a range of parameters when patients under the care of complementary/alternative medical (CAM)-oriented primary care physicians (including chiropractors) were compared with usual non-CAM primary care physician care. Although the care was primarily therapeutic, it appears to have had preventive effects as well. Over a 7-year period, hospital admissions were 60.2% lower, hospital days were 59.0% lower, outpatient surgeries and procedures were 62.0% lower, and pharmaceutical costs were 85% lower when compared with conventional medicine performance for the same health maintenance organization product in the same geography and timeframe.

At the opposite end of the spectrum are chiropractors who define themselves as “subluxation-based” practitioners, who concentrate almost entirely on the detection and reduction of the spinal joint surface disrelationships and dysfunctions that chiropractors call *subluxation*. The vast majority of chiropractors can be found in the broad middle of this spectrum. A recent paper by Nelson et al³ made the case for this middle-of-the-road definition of “chiropractic as spine care,” which is consistent with the World Federation of Chiropractic’s consensus definition⁴ of the profession.

The degree to which evidence-based prevention procedures are practiced by individual chiropractors does not necessarily correlate directly with one’s place on this spectrum, but inclusion of these procedures appears to be more likely among those closer to the primary care definition, which incorporates an evidence-based model to a greater degree. As we demonstrate in this article, current trends indicate that in the future, chiropractic will include a more wide-ranging and consistent emphasis on many areas of evidence-based prevention.

Currently, chiropractors’ prevention services focus primarily on physical activity and exercise and, to a lesser extent, on correction of poor nutritional habits. Other areas where chiropractors could potentially help their patients to pursue healthier choices—most notably smoking cessation—are addressed far less frequently. The following is a summary of studies evaluating chiropractors’ delivery of preventive services as commonly defined in the public health and health promotion communities.

Chiropractors Practicing Prevention: Survey of the Literature

Of the chiropractic academicians who have written extensively on prevention, the works of Jennifer Jamison, Cheryl Hawk, and Will Evans stand out for their high quality, depth of understanding, and holistic orientation. Each of these investigators has drawn from prevention models and data from the public health and health promotion communities and generated original research assessing chiropractors’ prevention practices with the goal of increasing implementation of evidence-based procedures. To this end, each has framed these prevention practices as means by which chiropractors can more fully live up to their professed ideals of holism, therapeutic conservatism, active care, and patient empowerment.

Jamison, a medical physician and educator who taught at Australian university-based chiropractic training programs for nearly 3 decades, surveyed chiropractors

and 316 of their patients at 20 Australian clinics to explore the health education behaviors of the chiropractors, ascertain their willingness to provide patient counseling, and evaluate the congruence of their responses vis-à-vis the interests expressed by their patients.⁵ Among her key findings was that chiropractors most often provide prevention information in the form of printed brochures rather than offering direct, interactive counseling to their patients, apparently due in large part to the additional unpaid time required to pursue counseling in depth. The conflicting imperatives of service to patients versus increased income mirror similar experiences in the private practices of medical physicians.

The chiropractic clinics in Jamison’s sample offered information on prevention topics at the following rates: exercise, 91%; diet, 72%; nutritional supplements, 67%; smoking cessation, 35%; alcohol abuse, 13%; and substance abuse, 12%. Jamison expressed particular concern at the low percentage of chiropractors (23%) who offered patients information on preventing osteoporosis, a condition with clear relevance to chiropractic practice. She also noted that although 78% of chiropractors expressed a willingness to counsel patients on injury prevention, 45% of the chiropractors had themselves experienced a work-related injury (most frequently the low back and wrist), perhaps pointing to a lack of congruence between their knowledge and their behaviors. Regarding patients’ desires and expectations for receiving health promotion information from their chiropractors, probably the most significant finding was that patients desired information from chiropractors at a higher rate than what the chiropractors provided. The disparity was most pronounced for information on cancer, with patients desiring this information from their chiropractors at 4 times the rate that chiropractic offices provided it. There were also significant differences between patient desires and chiropractors’ delivery of information about sleep, “social” drugs, heart attacks, and osteoporosis.

More recently, Jamison sought data on the wellness perspectives and practices

of Australian chiropractors in a study⁶ involving 43 chiropractors and 347 chiropractic patients (no less than 5 or no more than 10 per chiropractic clinic). Most patients reported that their chiropractors had inquired about their occupation (90%) and exercise (82%); many reported inquiries about their tobacco use (65%), weight (48%), alcohol (43%), and fruit and vegetable consumption (35%). Few chiropractors appeared to inquire about blood pressure (27%), cholesterol levels (17%), illicit drug use (10%), or unsafe sex (.9%). In discussing these results, Jamison noted the significant health impacts of these risk factors and concluded that “the chiropractic profession lacks a shared comprehensive approach to tackling this problem.”

In another survey of wellness practices in Australian chiropractic clinics,⁷ Jamison gathered data on the effects of providing health brochures to patients. Of 757 participants, 275 requested brochures. Women were more likely to request brochures than men, with nearly half of older (ages 46 and above) women taking 1 or more brochures. The “Better Sleep” brochure was chosen most often, with “Eating to Prevent Cancer,” “Prevent Osteoporosis,” and “Prevent Hypertension” as the next most frequently chosen topics. Of course, picking up a brochure, although a positive step, is no guarantee of changed health behaviors. In this study, of those who had taken brochures, less than 25% implemented changes within 3 weeks of receiving the information. However, with the exception of brochures for preventing skin and genital cancers, at least 2 of 3 patients who did initiate changes were continuing with their health improvement initiatives at 3 months. For many of the changed behaviors, adherence had declined substantially at the 12-month follow-up. After 12 months, the behavioral changes most likely to persist were increased exercise, maintaining a relaxing bedtime routine, and eating less fat and more fruits and vegetables. Perhaps the most hopeful sign was that more than three quarters of those making dietary changes to prevent cancer sustained their changes at the 12-month follow-up.

Because all of Jamison’s research was performed in Australia, it is unclear to what extent her findings can be generalized to the United States and other nations.

Hawk, a chiropractor with a PhD in preventive medicine who practiced for 12 years prior to embarking on a research career, was the lead author of 2 studies a decade apart dealing with primary care and prevention issues.^{8,10} Taken together, these studies offer insight into the status and trajectory of prevention efforts by chiropractors in the United States, where a majority of the world’s approximately 100 000 chiropractors practice.

In the earlier survey,^{9,10} a nationwide random sample of 753 chiropractors, Hawk and Dusio inquired as to whether chiropractors considered themselves to be primary care practitioners (PCPs), in part because it is widely understood that PCPs have a fundamental responsibility to provide preventive health services and information. Hawk and Dusio found that 90% of chiropractors consider themselves to be PCPs. In further defining their roles, 63% said chiropractors should be general primary care, portal-of-entry practitioners; 25% said chiropractors should be the chief portal of entry for musculoskeletal conditions but not general primary care; and 4% endorsed an arrangement where chiropractors serve as the designated specialists for musculoskeletal spinal conditions, rather than portal-of-entry practitioners.

Because chiropractors in North America and many other nations are unarguably portal-of-entry practitioners (ie, patients can legally access chiropractic care without medical referral), a status no chiropractor seeks to relinquish, it is likely that at least some respondents in the Hawk and Dusio study were unclear as to what constitutes primary care and portal of entry. The question of whether chiropractic practice is or should be primary care has at times been a source of heated debate within the profession. Whatever the eventual resolution, it is unclear what practical effects, if any, would ensue from a determination that chiropractors do or should practice primary care.^{1,11} It may be that the issue is mainly one of semantics.

Regarding comprehensiveness of overall services, Hawk and Dusio’s earlier study^{9,10} found that more than (58%) of respondents did a regional physical exam on every patient, 29% did a complete physical examination (PE) on every patient (chiropractic training requires demonstrating proficiency at PE), and 71% performed a complete health history (HH) on every patient. Conversely, 2% never did a complete HH, 12.5% never did a complete PE, and 3.8% never checked blood pressure. Lab tests, either in-office or referred out, were the least frequently employed procedure, with 1.5% performing them on every patient; however, 63% did them occasionally. Nearly one fourth never did lab tests. These findings appear inconsistent with the PCP role. On the other side of the equation, nearly 1 in 10 of the chiropractors had hospital privileges.

Regarding prevention counseling opinions and practices, Hawk and Dusio inquired on more than 20 topics, asking whether the respondents believed these to be topics that all chiropractors should discuss with patients and whether they had personally discussed them with patients in the preceding 3 months. The prevention practices most frequently discussed with patients were fitness and exercise, 68.1%; nutritional supplements, 65.8%; lifting techniques, 64.0%; and postural education, 59.8%. The data on belief versus practice included lifting techniques, which 78% said that all chiropractors should discuss with patients and 64% had actually discussed with a patient in the previous 3 months; smoking, where the respective figures were 53% and 53%; nutritional supplements, 51.6% and 65.8%; cancer detection, 54.5% and 32.9%; weight loss programs, 38.2% and 55.8%; and sexually transmitted disease, 48.6% and 19.2%. These figures reflect varying levels of individual commitment to different aspects of prevention and also an appreciation by chiropractors of a diversity of legitimate choices on how others should conduct their practices (ie, there need not be a single standardized answer to these questions).

The 2004 Hawk et al⁸ study assessed attitudes of chiropractic students, public health faculty, and practitioners concerning

clinical preventive and health promotion services. A total of 582 students, 45 faculty, and 496 practitioners were surveyed. More than 80% of practitioners reported providing information to patients on musculoskeletal risk reduction, exercise, diet, stress reduction, and injury prevention. More than 80% also reported obtaining information from patients on physical activity, stress, dietary habits, obesity, medication use, and occupational hazards. In general, female, younger, and more recently graduated practitioners appeared to be somewhat more likely to agree that chiropractors should provide prevention counseling and to report providing it. Concerning immunization information, a much higher proportion of faculty (91%) and students (80%) than practitioners (62%) felt chiropractors should provide both pro and con information to patients. This reflects a longstanding concern among chiropractors about potential adverse effects of vaccinations. Because the chiropractor's legal scope of practice specifically excludes prescription medicines and implicitly excludes telling patients to reject or discontinue their use, the vaccination issue should be a moot point for chiropractors who adhere to their legal scope of practice.

In addition, an association was seen between attitudes toward health indicator counseling and respondent education. Practitioners with at least a bachelor's degree (as of 2003, 67.5% of practicing chiropractors were 4-year college graduates)¹² were statistically significantly more likely to report providing counseling for physical activity, to agree that chiropractors should provide counseling, and to report actually providing counseling within the last month for substance abuse, responsible sexual behavior, mental health, and injury and violence prevention. Preprofessional education levels have risen steadily over the past several decades, and this may be indicative of future trends.

Educating Chiropractic Students in Prevention

For many years, public health education in chiropractic colleges focused on topics such as microbiology, sewage

treatment, potable water, and pasteurization that were only minimally relevant to chiropractic practice. In 1998, the Chiropractic Health Care Section of the American Public Health Association formed the Public Health Curriculum Task Force with the goal of improving the quality of public health training for chiropractic students. One year later, this report by interdisciplinary researchers was disseminated to all chiropractic colleges. It included a detailed list of topics and resources (developed by the task force with input from all faculty teaching public health in US chiropractic colleges) for inclusion in their public health courses. By 2001, a Model Course for Public Health Education in Chiropractic with greater relevance to health promotion and clinical preventive services, such as physical exercise, safe lifting, weight loss strategies, and smoking cessation, was recommended.¹³⁻¹⁶

Major changes have been under way since that time. As one example, Cleveland Chiropractic College—Los Angeles implemented a fully revamped public health curriculum that includes a modernized classroom syllabus along with policy changes that require interns in the college's public clinic to elicit information from their patients and provide appropriate prevention recommendations.

Globe et al¹⁷ evaluated the impact of these changes, measuring the frequency with which chiropractic interns provided appropriate prevention recommendations to patients. A standardized data abstraction form was developed, which was used for chart reviews before and after the curriculum change took effect. The primary purpose of this tool was to collect factors from each chart that would establish the need for preventive health services that could be provided by chiropractic interns (tobacco cessation, physical activity, obesity, nutrition, hypertension, reduction in dietary fat intake, blood cholesterol levels, and recommendations for screening for cervical, breast, and colorectal cancer). Guidelines from the US Preventive Services Task Force's Guide to Clinical Preventive Services were used to operationally define when a patient was a candidate for a preven-

tive health service recommendation. The investigators then evaluated the frequency with which interns actually delivered evidence-based preventive care advice to their patients when factors indicating such a need were present.

Unfortunately, Globe et al's initial data¹⁷ indicated a near-total failure to change intern behaviors. Of 408 charts examined (204 before and 204 after the curriculum change), there were only 4 documented instances (1%) of recommendations for any of the 9 preventive health service categories. Two of these recommendations occurred in the precurriculum change period.

Theorizing that this disappointing response may have resulted from a prevention services learning module that relied too heavily on didactic presentations and provided only minimal experiential learning opportunities, along with an inefficient system of audit by faculty clinicians, the college changed its pattern of instruction and accountability, instituting policies, including normative behavior feedback and guideline compliance prompts. Administratively enforced policies required both student interns and faculty clinicians to confirm that lifestyle and disease risk information is elicited from patients and evaluated by interns and their supervising clinicians to determine appropriate recommendations. In addition, a series of required audit steps was put into place to ascertain that these recommendations are presented to patients and that each patient's compliance is monitored periodically during his or her course of care.

Posters were affixed to the walls of the college's community clinic as reminders. Materials were provided for patients to facilitate self-efficacy concerns along with related patient/clinician prompts and brochures. Academic detailing procedures were amended to ensure continual clinician review via chart audits with feedback.

Perhaps most important, 2 new screening forms were created, using evidence-based materials from Healthy People 2010 and the US Preventive Services Task Force. These forms, the Physical Activity and Nutrition Behaviors Monitoring Form

(PAN)¹⁸ and the Adult Health Risk Profile (AHRP),¹⁹ are now an integral part of the intake paperwork for every new patient seen at the Cleveland Chiropractic College clinics in Los Angeles and Kansas City.

The PAN form quantifies more than a dozen aspects of physical activity and nutrition, including exercise, hours watching television, and amounts of sweet drinks and sodas, fast food, fatty snacks, milk and other calcium sources, fruits, and vegetables. The AHRP screens for risk factors related to injury prevention, tobacco use, sun exposure, oral health, tuberculosis, cholesterol, blood pressure, diabetes, colorectal cancer, sexually transmitted diseases/HIV, multivitamin/folic acid use, Pap smears, mammograms, osteoporosis, nutrition, physical activity, and body mass index.

The revamped prevention program, including educational intervention and clinical implementation, was instituted in the fall of 2005. In the spring of 2006, data were collected from randomly selected new patient files ($n = 159$). These revealed 636 prevention counseling opportunities among 159 patients. Of these, 201 counseling recommendations were documented. This represents a 33% improvement secondary to the clinically relevant intervention. The typical success rate in program intervention is approximately a 5% change in the target cohort's behavior.

Follow-up 1 year later demonstrated that PAN and AHRP forms were now introduced during preclinical coursework, without complaints from interns about completing these screening forms. In a dramatic sign of improvement, an October 2007 file audit found that 87% of files ($n = 156$) demonstrated that the AHRP screening forms translated into appropriate patient counseling recommendations as documented in the diagnosis and treatment progress notes.²⁰

In an example of an effort by a chiropractic college to implement a prevention strategy targeted at one specific behavior, Evans, a chiropractor with a PhD in health promotion (with a concentration in epidemiology), and colleagues studied chiropractic interns' interventions for smoking cessation,^{21,22} seeking to develop

a research-based training program for interns that could also be applicable to practicing chiropractors. The program, initially implemented at Parker College of Chiropractic in Texas, had 7 components: a lecture aimed at clinic interns, a card describing the Surgeon General's 5 As,²³ a lapel button, treatment room posters, a smoking cessation information brochure rack, a list of area cessation programs, and a paperwork stamp to track interns' participation levels.

Within 1 month of the delivery of the campaign, there was a 25% increase in the number of patients reporting receipt of smoking cessation information from interns. As noted by Evans et al,²² "this campaign was inexpensive and was well received. . . . It has been integrated into the curriculum as part of the wellness class required . . . before interns see patients in student or outpatient clinics." Viewing these results as a possible springboard to profession-wide changes, the authors continue, "Chiropractic has long been seen as a holistic profession that says it emphasizes wellness and better health for patients. We see no reason why advising smoking patients on cessation should not be a part of routine clinical chiropractic practice. We feel this should be made a requirement in all chiropractic colleges."

Broadening Implementation of Health and Wellness Strategies

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."²⁴ This profoundly affirmative biopsychosocial perspective, first enunciated by representatives of 61 nations at the International Health Conference in New York in 1946 and enshrined in the preamble of the WHO constitution, set a clear benchmark that health professionals and all who seek the greater well-being of the public have sought to employ for the past 6 decades. A contemporary wellness movement worthy of the name must be as broadly based as possible, drawing on the skills and energy

of all individuals and groups who share its high ideals and seek to contribute to their realization.

In 2001, the American Chiropractic Association endorsed a consensus document outlining a detailed wellness model for the chiropractic profession.²⁵ This active care model strongly encourages patient participation, seeking to lay the groundwork for a profession-wide effort to pursue evidence-based evaluation and assessment of patients, provision of educational information to patients, intervention and monitoring, and coordination with other community resources.

Probably the single most important elaboration of the burgeoning evidence-based wellness movement within chiropractic was the mandate²⁶ from the profession's accrediting agency, the Council on Chiropractic Education (CCE), that requires all students graduating from chiropractic colleges after January 2007 to demonstrate knowledge of evidence-based prevention approaches and mastery of methods for applying these approaches in the clinical setting. The CCE wellness mandate grants individual institutions leeway to craft their own wellness training programs, but all institutions will be audited for compliance with the key markers spelled out in the mandate. Thus, all future chiropractic graduates will be required to demonstrate evidence-based wellness assessment and intervention skills, which presumably will carry over into their careers as practicing chiropractors.

Suitability of Chiropractic Practice for Health Promotion Counseling

Hawk²⁷ has aptly noted, "Chiropractors are in an excellent position to reinforce health promotion messages at each visit, because chiropractic care requires multiple visits, and chiropractors usually establish long-term relationships with patients." Moreover, Harvard medical educators Kaptchuk (an acupuncture and Chinese medicine practitioner) and Eisenberg (a medical physician) concluded that, in general, the ability of

chiropractors to develop rapport and connection with their patients is among the greatest strengths of the profession.²⁸ The combination of strong rapport plus ongoing opportunities for presentation and reinforcement of health promotion messages seems tailor-made for success, as long as chiropractors are properly trained and willing to make the effort.

Regarding the reasons (aside from chronic neuromusculoskeletal disorders) that patients pursue ongoing, multiple-visit care with chiropractors, it is worth noting that many patients initially come to chiropractors for back pain or other neuromusculoskeletal complaints and then discover that chiropractic offers more than they expected—a holistic philosophy of natural healing, based on principles asserting that structure and function are intimately related, that manual methods are a key means for achieving structural and functional integrity, that diet and exercise are crucial determinants of health, and that stopping illness before it starts (or in its early stages) is always better than intervening when illness or dysfunction has rooted deeply.

Ongoing Care: Does Adjustment/Manipulation Yield Preventive Effects?

Chiropractors have long hypothesized that manual adjustments have a protective or preventive influence on human physiology and that these effects are mediated by the nervous system. This has led many chiropractors to recommend ongoing care (known as maintenance, wellness, or preventive care) even in the absence of problematic symptoms. Observers have questioned whether this is legitimate.

The answer is not simple because there is supporting evidence, but it falls short of being clearly persuasive. Adjustment/manipulation is most frequently justified by the presence of palpably restricted joint mobility and, in some cases, radiographically demonstrable joint surface disrelationships at 1 or more spinal levels. These findings often coincide with pain or other symptoms but may also appear as a precursor to such symptoms. Thus, if joint restriction is noted even in

the absence of symptoms, this may serve as a rationale for the application of manual adjustment.

As Hawk²⁷ frames the issue, “People unfamiliar with chiropractic might only think of chiropractic adjustments . . . as a sort of ‘aspirin,’ that is, a treatment to reduce pain, and so would not seek care if they did not have any symptoms. This use of chiropractic care would be seen as curative care or possibly tertiary or secondary prevention. . . . However, conceptually, if adjustments remove or reduce a risk factor (subluxation) and prevent disease or disability from occurring, this would be *primary* prevention. . . . In this view, screening for subluxations in asymptomatic people would therefore be more akin to doing a health risk appraisal than it would be to screening for early manifestations of disease, such as mammography does.” Hawk continues, “This conceptual framework is as yet undocumented, due in part to the difficulty of designing and conducting studies to investigate it. However, it has served as the theoretical basis for much of chiropractic practice for more than 100 years, and thus has the considerable weight of clinical experience to support it, if not yet the support of scientific evidence.”

As for evidence that might be considered supportive, in a landmark, wide-ranging article on chiropractic in the *Annals of Internal Medicine*, Meeker and Haldeman²⁹ proposed a series of mechanical and neurologic mechanisms to explain the effects of spinal manipulation. Some of these clearly involve symptomatic presentations, whereas others also apply to minimally symptomatic or even asymptomatic cases where they may exert either primary or secondary preventive effects:

1. Alleviation of an entrapped facet joint inclusion or meniscoid that has been shown to be heavily innervated^{30,31}
2. Repositioning of a fragment of posterior annular material from the intervertebral disk^{31,32}
3. Alleviation of stiffness induced by fibrotic tissue from previous injury or degenerative changes that may include adaptive shortening of fascial tissue^{33,34}

4. Inhibition of excessive reflex activity in the intrinsic spinal musculature or limbs and/or facilitation of inhibited muscle activity³⁵⁻³⁷
5. Reduction of compressive or irritative insults to neural tissues³⁸

The one survey in the Medline-indexed, peer-reviewed literature that directly addresses the possible effects of ongoing care is the study by Rupert³⁹ and Rupert et al⁴⁰ on Medicare patients. These investigators surveyed a randomized sample of practicing US chiropractors and a representative sample of chiropractic maintenance care (MC) patients, age 65 and older, seeking information on health promotion activities associated with MC visits. Exclusion criteria required that patients must have been under MC for at least 5 years, with a minimum of 4 visits per year.

The chiropractors judged that the purpose of MC was to optimize health (90%), prevent conditions from developing (88%), provide palliative care (86%), and minimize recurrence or exacerbations (95%). The therapeutic composition of MC placed virtually equal weight on exercise (96%) and adjustment/manipulation (97%), whereas other interventions, including dietary recommendations (93%) and patient education about lifestyle changes (84%), shared a high level of importance.

Information elicited from patients included the SF-36D survey, patient health habits, expenditures on health services, frequency of use of health providers, and perceived value of chiropractic prevention and health promotion services. Key findings were that, in addition to manual procedures, it was common to recommend stretching exercises (68.2%), aerobic exercises (55.6%), dietary advice (45.3%), and a host of other prevention strategies, including nutritional supplements and relaxation. Perhaps the most intriguing finding was that the patients investigated in this study reported making only half the annual number of visits to medical providers (4.76 visits per year) compared with the national average (9 visits per year) for individuals age 65 years and older. The methodology

used by Rupert³⁹ and Rupert et al⁴⁰ does not justify conclusions regarding cause and effect, but the possibility of a health benefit from MC remains an open and potentially important question for future research.

Opportunities for Collaboration and Integration

As chiropractors equipped with evidence-based health promotion training (along with their highly developed skills in manual manipulation and related methods) gradually enter a health care mainstream that itself is changing, significant opportunities are emerging for interprofessional cooperation, collaboration, and integration. The degree of mainstreaming and integration seen over the past generation has exceeded the expectations of all but the most optimistic observers and participants. Much has been accomplished, but there is still much more to do.

The breakthrough that may have the greatest potential to be a truly transformative “game changer” in developing models for collaboration and integration is the inclusion of chiropractors on the medical teams serving active-duty members of the US military as well as military veterans. Shortly after the turn of the 21st century, the US Congress passed 2 landmark laws bringing chiropractic into the mainstream of military and veteran health care. In 2000, President Clinton signed the National Defense Authorization Act, which required that chiropractic care be made available to active-duty military personnel. Then, in 2002, President Bush signed the Department of Veterans Affairs Health Care Programs Enhancement Act, which included a mandate to establish a permanent chiropractic benefit within the Department of Veterans Affairs health care system. Each of these laws built upon successful pilot projects in the 1990s that demonstrated the value of chiropractic services while developing ways to integrate chiropractors into the health care teams at military bases and Veterans Administration hospitals. Full access to

chiropractic services in both systems is currently in a multiyear phase-in period. When chiropractors work alongside other health care personnel for the benefit of their common patients, camaraderie often develops that has the potential to heal longstanding divisions, prejudices, and misconceptions on all sides.⁴¹

Interdisciplinary cooperation is further fostered by the presence of chiropractors on the staffs of more than 200 US hospitals and the sports medicine staffs for the Olympic Games and numerous teams in the National Football League, National Basketball Association, and Major League Baseball, as well as collegiate, scholastic, and youth club sports.

These collaborative ventures encourage the strengthening of mutual respect between chiropractors and members of other health professions through the natural give-and-take of daily doctor-to-doctor interaction. No profession can be all things to all people, and learning how the skills of others can complement one's own should, ideally, elicit feelings not of competition but relief and gratitude. From such unexpected insight ideas for cooperation, collaboration and the creation of a higher synthesis can emerge. The history of medical-chiropractic cooperation and joint ventures is as yet neither broad nor deep, but great possibilities may lie in this mostly untapped ore. Planners and policy makers can (and should) envision and seek to implement models for such cooperation, but it is in the actual joy and friction of working together as colleagues that the most practical and sustainable models are likely to arise. This is what makes the Department of Defense, Veterans Administration, and sport-related programs so crucial to the development of chiropractic's full potential as an integral part of the overall health care system.

Research is another key area where chiropractic-medical collaboration has grown and deepened in recent years. Interdisciplinary research came to the fore earliest in Canada and Europe and is now well established in the United States as well. The first paper in a medical journal to be coauthored by a chiropractor and a medical physician appeared in

Canadian Family Physician in 1985,⁴² the result of a collaborative effort by Kirkaldy-Willis, a world-renowned orthopedist, and Cassidy, a chiropractor who later became the first member of his profession to serve as research director of an orthopedics department at a university hospital (University of Saskatchewan).

The approximately 300 subjects in this study were “totally disabled” by low back pain, with pain present for an average of 7 years. All had gone through extensive, unsuccessful medical treatment prior to participating as research subjects. After 2 to 3 weeks of daily chiropractic adjustments, more than 80% of the patients without spinal stenosis had good to excellent results, reporting substantially decreased pain and increased mobility. After chiropractic treatment, more than 70% were improved to the point of having no work restrictions. Follow-up a year later demonstrated that the changes were long-lasting. Even those with spinal stenosis, a particularly challenging subset, showed a notable response. More than half improved, and about 1 in 5 were pain free and on the job 7 months after treatment.

In a recent example of medical-chiropractic collaboration, Dickholtz, a Chicago chiropractor, and Bakris, a medical hypertension specialist at the University of Chicago and director of the Rush University Hypertension Center, published a study⁴³ in which upper cervical chiropractic adjustments led to sustained improvement in chronic hypertension patients, “similar to that seen by giving two different anti-hypertensive agents simultaneously,” with 88% of subjects in the treatment group experiencing greater than an 8-mm Hg drop in diastolic blood pressure.

For more 2 decades, the US federal government has supported various chiropractic research projects. This has included funding of clinical trials, infrastructure development, a series of research agenda conferences, and R25 grants to several chiropractic colleges to enhance the teaching and understanding of evidence-based health care among chiropractic college faculty and students.

Criteria for Referral to a Chiropractor

Regarding criteria that medical physicians may wish to consider in deciding when they should refer patients to a chiropractor (and to which individual chiropractor), it may be most helpful to address the most challenging question first. This is the issue of duration of care and the potential for overtreatment. Although a fully adequate discussion and explanation of this issue would require another article, we propose the following starting points for informed consideration of the matter:

1. *Duration of care for similar conditions varies very widely among chiropractors.* As noted by former chiropractic college president and national association executive, J. F. McAndrews,⁴⁴ “Depending on which chiropractor a patient sees, the recommended course of care for the same condition may vary drastically, from several visits with one doctor to several dozen—sometimes hundreds—with another.” That such disparities exist and such excesses are apparently legal may indicate a flaw in the health care market and regulatory systems as currently constituted. Managed care, despite its many problems and limitations (well-known to chiropractors and medical doctors alike), has placed some limits on such extreme practice variation. The problem, however, is as yet unresolved.
2. *No doctor can know the course of a patient's recovery in advance.* Routine treatment plans for extended courses of care (ie, dozens of visits) should be considered red flags, particularly if patients are encouraged or required to sign advance commitments for such programs or required to pay in full upfront.
3. *Ethical, efficacious treatment plans should be individualized.* There is no evidence-based rationale for recommending precisely (or approximately) the same course of care for all patients. Chiropractors who do so are not practicing in a professional manner.
4. *Retraining neuromusculoskeletal patterns and rebalancing musculoskeletal structures sometimes does require an extended course of care.* This is widely recognized by chiropractors, osteopaths, physical therapists, and physiatrists. It is particularly true in cases of higher complexity resulting from trauma or significant structural distortion or with patients whose general health is poor. In a small number of cases, this might require several dozen or more visits over a period of months or even years. Both authors of this review have had patients who legitimately fit this pattern.
5. *A treatment plan appropriate for a modest number of carefully selected patients should not be applied in a broad-brush fashion to all or most of a chiropractor's cases.* Medical physicians may legitimately consider such a pattern to be very strong evidence against referring patients to a particular chiropractor. Fortunately, there are many ethical chiropractors to whom referral can be made with confidence.
6. *To be judged legitimate, extended courses of chiropractic care must gradually increase emphasis on active care (exercise) and gradually decrease passive care (manipulation and related therapies).*

Additional questions for medical doctors to consider when seeking the right chiropractor for referrals include the following⁴⁵:

1. Have you heard positive reports from patients or others in the community regarding the care given by this chiropractor?
2. Will the chiropractor allow you to visit his or her office and observe at least a few patients being treated?
3. Will he or she send you initial reports and timely updates on patients you refer?
4. Does he or she routinely X-ray all patients (current guidelines advise against this) or fail to use X-ray and other imaging procedures when clinically indicated?

Summary

Chiropractic is currently in transition, steadily moving toward a more mainstream status. Chiropractors can play a meaningful role in both treatment and prevention, complementing the efforts of other healing arts. Recent changes in the public health curricula of chiropractic colleges, with strong support from the Council on Chiropractic Education, demonstrate a dramatic upgrading of evidence-based prevention approaches in chiropractic educational settings. As students with greatly enhanced prevention training graduate and begin their careers, this should ripple across the mainstream of chiropractic practice in the coming years.

Acknowledgments

We acknowledge Glen Jukes, DC, James Brantingham, DC, PhD, and Ruth Sandefur, DC, PhD, for their helpful assistance with the literature search. 

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