



## Professional Notes

### Chiropractic and Golf – A Winning Combination

Many professional golfers make daily use of chiropractic care while on tour to remain injury-free and improve function and performance – and these include leading American golfers Jordan Spieth (*below*) and Zach Johnson, winners this year of the Masters and US Open (Spieth) and the British Open (Johnson).

Interviewed for the November issue of the American Chiropractic Association's *ACA News*, both explain that they have relied on chiropractic care throughout their careers since teenage years. Their current chiropractor is Dr Troy Van Biezen of Dallas who has traveled on the PGA Tour for 13 years, for 9 of these as part of the Tour medical staff serving as on-site chiropractor for



*continued on page 4*

## Mainstreaming of Placebo Effects

*"It is quite clear that the benefit of many of our interventions depends on the placebo response. These are real and powerful effects...Clinicians should celebrate placebo and use it at every opportunity."*

Jeremy Fairbank, ISSLS Presidential Address (2015)<sup>1</sup>

### A. Introduction

THE CONCEPT OF PLACEBO (*Latin*: I will please) interventions and responses to treatment came first from the religious world. In 16th century Catholic trials individuals apparently "possessed" by the devil were tested by giving them false or placebo holy objects. The idea of placebo controls in medical experiments, and then innocuous placebo treatments in practice to make patients comfortable, was introduced in a medical context in the 18th century.<sup>2</sup>

These origins partly explain the poor reputation of placebos and placebo effects until recent years. Mainstream healthcare interest in placebo effects began with the growth of clinical research trials in the second half of the last century, but it is only in the past 15 years that there has been serious interest in investigating placebo responses to treatment by rigorous research methods.

This interest has been fuelled by an increasing number of trials reporting that many sham or placebo interventions produce equally good and long-lasting results as their real or active counterparts – interventions that include surgery, medications, acupuncture and manual therapies.

The above quote from Dr Jeremy Fairbank, the prominent British orthopedic surgeon and researcher in his presidential address to the annual meeting of the International Society for the Study of the Lumbar Spine (ISSLS), the foremost international research society in the specialty area of spine care, illustrates how dramatically the situation has changed.

There is now a Program in Placebo Studies at the Harvard Medical School,

led by Dr Ted Kaptchuk. In a review just published in the *New England Journal of Medicine* titled *Placebo Effects in Medicine* he explains that "recent clinical research into placebo effects has provided compelling evidence that these effects are genuine biopsychosocial phenomena" with complex but specific neurobiologic mechanisms. These act through the same pathways as many common medications.<sup>3</sup>

Until the last 10 years researchers would try to test and report on the effectiveness of a treatment by performing a randomized, controlled trial (RCT) in which one group of patients received the active treatment (e.g. acupuncture, medication, spinal joint manipulation, surgery, ultrasound) and a second group thought it was receiving an active treatment but received a sham/placebo (e.g. sham acupuncture, inert pills, soft-tissue mobilization, surgery with the active step omitted, detuned ultrasound). Fundamental problems included:

- Often those receiving the placebo treatment had equally good results. See the surgery trials discussed below.
- It was unclear whether those good results came from the placebo intervention (i.e. the sham intervention actually had direct benefit), the overall health care encounter (i.e. the ritual of healthcare, the context in which the treatment was given), regression to the mean (i.e. with pain conditions patients tend to seek care when at their worst and are likely to experience improvement even without care) or the overall natural history of the condition.
- Compounding the confusion, some medications considered active and effective were found only effective if prescribed in the context of an appro-

appropriate clinical setting. Was the context of treatment more important than the treatment, itself?

Such questions have led to a new analysis of effectiveness and placebo responses, tested by different and expanded trial designs. In a new RCT for the treatment of asthma from Wechsler, Kelley et al. at Harvard patients were assigned to four blinded comparison groups receiving:

- Inhaled albuterol – the active treatment
- A placebo inhaler – placebo one
- Sham acupuncture – placebo two
- No intervention – a control group for both the active and placebo treatments.

There was no significant difference in patient reports of improvement for the albuterol inhaler (50%), placebo inhaler (45%) and sham acupuncture (46%), but all of these were significantly greater than improvement in the no intervention group (21%). Wechsler, Kelley et al. conclude that “albuterol provided no incremental benefit with respect to the self-reported outcomes. Placebo effects can be clinically meaningful and can rival the effects of active medication in patients with asthma.”<sup>4</sup>

Much has happened since The Chiropractic Report last reviewed placebo responses eight years ago. In this issue we look at current definition and understanding of the now much more highly regarded and analysed placebo responses in health care. We look at what this means for chiropractic practice and how chiropractors, to use the words of Fairbank, “should celebrate placebo and use it at every opportunity.” Firstly, however, let’s look at some examples from surgery that many will find remarkable.

## B. Examples from Surgery

2. Surgery is a good place to start in a discussion of placebo because it provides a clear challenge to traditional thinking about the nature and role of placebo. Most patients hope for good results from surgery but would not expect to get equally good and long-term results from fake surgery. But many trials have produced this surprising result.

As long ago as 1959 the New England Journal of Medicine (NEJM) published a trial comparing real and sham surgery

which reported equal, significant and sustained improvement following sham surgery<sup>5</sup>. This was for patients with angina. A recently developed surgical approach to treatment involved ligation or tying of the internal mammary arteries, on the theory that this would lead to the development of collateral arteries that would bring improved blood supply to the heart.

Cobb, Thomas et al. decided to test the effectiveness of this in a blinded RCT by giving one group of patients the surgery and a second group all aspects of the surgery except the final step of the actual ligation. About 70% of patients in each group experienced major and sustained relief from angina. The ritual of surgery and follow up, and the meaning of this to patients, amounted to a powerful healing force that eclipsed any direct benefit there may have been from ligation.

3. Over 40 years later in 2002 the NEJM published another example of the power of placebo in surgery – a well-designed, contemporary RCT of arthroscopic surgery for patients with osteoarthritic knee pain. Again, those receiving placebo or sham surgery did every bit as well as those receiving the real surgical procedures. Let’s look at this trial in greater detail.

By the 1990s arthroscopy had become the most common form of orthopedic surgery, and in the United States the knee was by far the most common joint in which this surgery was performed. This was very frequently for patients with knee pain and osteoarthritis. Billions of dollars were being spent annually, but it remained unclear how arthroscopic knee surgery to shave and trim the joint (debridement) and to flush out debris (lavage) actually brought pain relief. No physiological basis had been demonstrated.

Therefore with funding from the Department of Veterans’ Affairs, Moseley, O’Malley et al.<sup>6</sup> conducted a placebo-controlled trial at the Houston Veterans Affairs Medical Center between 1995 and 1998 to see if there was any physiological basis and specific surgical effect for pain relief and improved function. In summary:

a) To be included in this study patients had to be 75 years of age or younger, have osteoarthritis of the knee, have reported at least moderate knee pain despite maximal medical treatment

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for at least 6 months, and have not had arthroscopy of the knee during the previous two years.

b) 180 such patients were recruited and randomized into three groups:

i) Lavage. After diagnostic arthroscopy the knee joint was lavaged with at least 10 liters of fluid. If a mechanically important, unstable tear in the meniscus was encountered the torn portion was removed and the remaining meniscus smoothed – otherwise there was no debridement.

ii) Debridement. After diagnostic arthroscopy there was lavage and debridement of the joint, with all loose debris removed and the remaining meniscus shaved and finished to a firm and stable rim.

iii) Placebo procedure. To preserve blinding in the event that patients in this group did not have total amnesia, a standard arthroscopic debridement procedure was simulated. Three

1-centimeter incisions were made in the skin. The surgeon asked for all instruments and manipulated the knee as if arthroscopy was being performed. Saline was splashed to simulate the sounds of lavage. But there was no lavage or debridement. Post-operative care for patients in all three groups was the same – in terms of hospital stay, walking aids, graduated exercise program and analgesics.

c) The one surgeon who performed all the procedures was board-certified as a surgeon, fellowship-trained in arthroscopy and sports medicine, had been in practice for 10 years in an academic medical center, and was currently the orthopedic surgeon for a National Basketball Association (NBA) team – an established expert in this field of surgery.

d) Results were measured subjectively (5 different scores reported by patients – 3 on scales for pain, and 2 on scales for function) and objectively (a walking and stair-climbing test) at many follow-up points – 2 weeks, 6 weeks, 3 months, 6 months, 12 months, 18 months and 24 months after the procedure.

e) The placebo group did as well or better than the other two groups on both pain relief and improved function throughout the two year follow-up period. At various points during follow-up “objective function was significantly worse in the debridement group than in the placebo group.”

f) Moseley, O’Malley et al. conclude that their trial “provides strong evidence that arthroscopic lavage with or without debridement is not better than . . . a placebo procedure in improving knee pain and self-reported function.” Further, “This study has shown a great potential for a placebo effect in surgery. . . . Health care researchers should not underestimate the placebo effect, regardless of its mechanism.”

This trial suggests that patients improved, both in the real and sham surgery groups, because of the opportunity, expectations and meaning of surgery from a respected surgeon in a major hospital and the close attention and follow-up care they received in the trial – in other words from non-specific or placebo effects. And these patients, like many chiropractic patients, were chronic pain patients who had failed to progress during six months under other medical care. Therefore this was not natural remission over time, but rather self-healing unlocked by an expert surgical approach – given with confidence but apparently no actual specific treatment effect.

## C. Current Understanding of Placebo Effects

**4. Definition.** In traditional understanding of and attitudes towards placebo there has been a focus on the placebo intervention itself, and its inert or sham content. As Finnis, Kaptchuk et al. explain in their excellent review of advances in the understanding of placebo in the *Lancet* in 2010<sup>2</sup>, this “has led to difficulties in defining and understanding placebo effects” and to applying them in clinical research and practice.

It is necessary, as they say, to reconsider the matter “shifting the focus from the inert content of a placebo or sham procedure to what the placebo intervention – consisting of a simulated treatment and the surrounding clinical context – is actually doing to the patient.” They therefore define placebo effects, not placebo, making these points:

a) The placebo effect is “a genuine psychobiological event attributable to the overall therapeutic context.”

b) This context consists of individual patient factors (e.g. expectations from experience, the ritual involved), clinician factors (e.g. confidence, empathy) and “the interaction between the patient, clinician, and treatment environment.”

c) The ‘treatment environment’ comprises many factors, associated first with the ‘treatment context’ (e.g. specific nature of treatment, the way in which it is delivered) and second ‘the patient-clinician relationship.’

d) When an active treatment is given the overall response is the result of two things – the treatment itself and the ‘treatment environment’. When a placebo intervention is given the response or effect is the result of the ‘treatment environment’. (If the presumed placebo in fact has direct treatment effect it is not a placebo. This, as the research now demonstrates, is the case with spinal manipulation for various conditions.)

e) This approach to definition and understanding explains the importance of placebo effects to all healthcare and healing, and encourages further study of the mechanisms by which they operate – and how they can best be enhanced in clinical practice.

Kaptchuk and Miller, writing this year, define placebo effects as “improvements in patients’ symptoms that are attributable to their participation in the therapeutic encounter, with its rituals, symbols, and interactions. . . . This diverse collection of signs and behaviors includes identifiable health care paraphernalia and settings, emotional and cognitive engagement with clinicians, empathic and intimate witnessing, and the laying on of hands.

“Placebo effects rely on complex neurobiologic mechanisms involving neurotransmitters (e.g., endorphins, cannabinoids, and dopamine) and activation of specific, quantifiable, and relevant areas of the brain (e.g., prefrontal cortex, anterior insula, rostral anterior cingulate cortex, and amygdala in placebo analgesia). Many common medications also act through these pathways.”<sup>3</sup>

**5. Does personality type affect the likelihood of being a placebo responder?** It is a myth that people who respond to placebos are peculiar, or different from the rest of us. Anxiety has often been identified as a personality trait of those who respond to placebo. It is essential to differentiate:

- Anxiety as a personality trait, experienced at relatively high levels as a chronic or stable characteristic of one’s life-style;
- Situational anxiety, which is experienced by everyone in specific high-stress circumstances.

Turner, Deyo et al.<sup>7</sup> explain that studies have shown that situational anxiety is related to placebo-induced changes in pain tolerance, but that chronic anxiety is not. The literature also provides no consistent data to suggest that other personality variables such as dependency, dominance, compliance, social desirability, introversion, extroversion, acquiescence or neuroticism predispose individuals to placebo reactions. Certain traits, in combination with specific situations of anxiety, may well predispose some individuals to placebo responses. However, it is the situation that is the dominant factor – and this applies to everyone.

**6. Mechanisms of Action.** Placebo effects arise from many contributing mechanisms, as illustrated by Finnis, Kaptchuk et al. in Table 1. These effects can be considered from two perspectives – psychological and neurobiological.

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# The Chiropractic World

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about 145 golfers. Today he works with select pros on tour, and with high-level junior and college players when in Dallas. From the *ACA News*:

### **JORDAN SPIETH Attributes Masters Win to Chiropractic**

In a recent article ([www.allamericanhealthcare.net/asters-winner-jordan-spieth-benefits-from-chiropractic](http://www.allamericanhealthcare.net/asters-winner-jordan-spieth-benefits-from-chiropractic)), pro golfer Jordan Spieth calls golf a team sport—referring to the contributions made by his caddie, coach, trainer and manager and sports chiropractor Dr Troy Van Biezen. So far this year, Spieth has won four PGA tournaments, including the Masters, earning more than \$10 million.

Spieth has received chiropractic care since he was 14 to prevent injuries and optimize overall health and athletic performance.

“Dr. Van Biezen is an important member of my team, and thanks to his care, my all-time dream of winning the Masters Tournament has become a reality,” Spieth says.

Dr. Van Biezen travels full time with Spieth, providing chiropractic care once or twice daily. “An individualized chiropractic care plan, including prevention and recovery-focused techniques, is essential for maintaining good health and gives Jordan a competitive edge”, notes Dr. Van Biezen.

### **ZACH JOHNSON Grew Up With Chiropractic**

Another top PGA Golfer is Zach Johnson, who has earned about \$4.4 million on the PGA Tour so far this year. He, too, is no stranger to chiropractic care. Throughout his childhood and teenage years he received chiropractic care from his father, ACA member David Johnson, DC. Like Spieth, Zach Johnson had Dr. Van Biezen on tour with him as the professional sports DC.

“I adjusted Zach throughout his formative years, but less now that he works with Troy when he is on tour” says Dr Johnson. “I don’t need to offer much advice because his team includes a chiropractor, strength trainer, PGA professional golf coach and sports psychologist. I occasionally adjust him when he comes home or if we are visiting him.”

Watching the high level of training and care his son receives is a bit of an eye-opener for Dr Johnson. “I’ve always known that chiropractic care improves function and balance and reduces pain associated with the grind of repetitive movement and high-speed movement in the golf swing”, says Dr Johnson. “However, since Zach has been on the tour, I have seen firsthand how much professional golfers rely on chiropractic care. Zach also depends on nutritional and exercise support for maintaining his high level of performance and function.”



*David Johnson, DC (left), with his son, Zach Johnson, holding the Claret Jug, with Troy van Biezen, DC, at a British Open party.*

## Research

### **Prognostic Factors for Recurrent Neck Pain**

A new prospective study of 545 adult neck pain patients receiving standard chiropractic care from members of the Association of Swiss Chiropractors (Chirosuisse) is noteworthy because:

- It assessed the number of recurrences during a 1-year follow up period and found that 89% of patients had no recurrences – an impressively high figure for no recurring problems for patients with a condition characterized by recurrences.
- It looked at 9 possible prognostic factors for recurrence – age, pain medication usage, sex, work status, duration of complaint, previous episodes of neck pain, trauma onset, pain level on a numerical rating scale, score on the Bournemouth Neck Pain Questionnaire – and found only two of these were prognostic factors. These were older age (over 45) and previous episodes of neck pain. (The authors acknowledge that psychological factors are also prognostic – but these were not measured in this study).

Points are:

- a) While other studies referred to have described courses of treatment and prognostic factors, the authors note that this is the first prospective study to determine “prognostic factors for recurrence of neck pain as a primary outcome measure.”
- b) Patients had neck pain of any duration, but were 18 years or older, had no red flags, and had not had any chiropractic or other manual care in the past 3 months.
- c) They received “normal and usual chiropractic care” from their chiropractors, and Langenfeld, Humphreys et al. explain that commonly used elements “were of spinal manipulation, trigger point therapy, therapeutic exercises, mobilization techniques and advice on the activities of daily living.”
- d) Patient data were collected at baseline, and 3, 6 and 12 months, with trained research assistants calling by telephone and using standard scripts. “Recurrent neck pain” was defined as “pain that occurred at least 2 times over the past year with each episode of neck pain lasting at least 24 hours, with a pain intensity of greater than 2 on an 11-point NRS and at least a 30 day pain-free episode between episodes.” Additionally, patients were deemed recurrent if they were attending additional treatment for their neck pain such as acupuncture, physiotherapy, osteopathy, or surgery.

Of the 11% or 54 patients who had recurrent pain, 39 began other treatment including 6 who had surgery.

(Langenfeld A, Humphreys K et al. (2015) *Prognostic Factors for Recurrences in Neck Pain Patients Up to 1 Year After Chiropractic Care*. *J Manipulative Physiol Ther* 2015;38:458-464.)

### **Advice to Stay Active vs Exercises for Sciatica**

The last issue of this Report discussed a new systematic review that supported manipulation as one of the favorable options for management of sciatica, but reported that the evidence did not support exercises. A further new systematic review just published in *Spine* looks at and compares advice to stay active and structured exercise. Points are:

# News and Views

- The two principal researchers are chiropractors – Matt Fernandez MChiro, Faculty of Health Science, University of Sydney, Australia, and Jan Hartvigsen DC, PhD, NIKKB, University of Southern Denmark.
- Overall there is little between these two forms of active care – low-grade evidence suggests exercises may produce greater leg pain relief early on but not less disability – moderate evidence suggests both are equal in the medium and long term.
- The authors suggest the key value of structured exercise might be for sub-groups of patients – e.g. where there is sciatica with directional preference on end-range loading structured exercise may be better.

- Cost-effectiveness is complicated. Structured exercise provides more direct treatment cost, but may be overall cost-effective if reducing lost work/productivity. More evidence is needed before any conclusions can be drawn, they say.
- There is good comment on what may be most important of all – management that gives the patient empathy, understanding and confidence.

(Fernandez M, Hartvigsen J et al. (2015) *Advice to Stay Active or Structured Exercise in the Management of Sciatica*. Spine 2015;40:1457-1466.)

## FICS Foundation Supports Athletes with Disabilities

The International Federation of Sports Chiropractic (FICS – [www.fics-sport.org](http://www.fics-sport.org)), whose members are national councils of sports chiropractors and individual chiropractors worldwide, has now established a charitable foundation. It is chaired by prominent US sports chiropractor and former Boston Red Sox pitcher Dr John Danchik (*right*).



"I am excited to announce the first projects being funded by the Foundation," says Dr Danchik, "which are for athletes with disabilities at both the community and elite level, and in developing and developed countries. Please join the members of the Foundation Board and many others in now contributing at whatever level you can to the Foundation."

Projects approved include funding and donated chiropractic health care support for three para powerlifters in the Philippines training to qualify for the 2016 Rio Olympics, and the same for Special Olympics community youth athletes with disabilities in the Congo. Next projects will be for wheelchair rugby athletes and para powerlifters in Australia, Europe and North America.

The Philippines project is in partnership with the national powerlifting federation in the Philippines (Philspada) and is being managed by Foundation Board member Dr Martin Camara of Manila. The athletes are receiving monthly stipends for training and living costs, and funding for expenses of competitions.

The Congo project is in partnership with Special Olympics Congo and managed by Sister Brigitte Yengo DC, SOC Past President (*right*). There is an initial payment of US\$5,000 towards costs of youth with disabilities participating in local and regional events.



The vision of the Foundation is that through raising funding for athletes in need, and to support sports chiropractic education, research and voluntary

service at major games events, the future will see access to sports chiropractic in training and competition for all athletes, and this as part of the recognized and standard sports medicine team.

More information on FICS, its Foundation, the members of the Foundation Board and these projects, is at [www.fics-sport.org/foundation](http://www.fics-sport.org/foundation). You will see options for donations in your own currency, either a one time donation or monthly giving at various levels from US\$5-00 upwards.

"It is my pleasure to serve on the FICS Foundation's Board," says Foot Levelers CEO and prominent philanthropist Kent Greenwalt. "Please join me and all other Board members in giving monthly what you can to this important cause for athletes and the profession. I challenge you to donate the equivalent of one adjustment visit a month."



One of the three Filipino powerlifters.



a) **Psychological mechanisms.** These mechanisms, they say, include “expectations, conditioning, learning, memory, motivation, somatic focus, reward, anxiety reduction and meaning.” The two principal and best-supported mechanisms are:

- **Expectations.** Studies show that the expectations of both the patient and the clinician influence responses. With respect to patients, many experiments have used simple verbal information to change expectations and placebo responses. For example, a participant with experimentally-induced pain is given a placebo cream in the context of two different explanations, first that it is inert with no effect, and next that it is a powerful painkiller. Such verbal cues have been shown to manipulate expectations and influences responses.

With respect to clinicians, in a double-blind study of dental patients dentists were informed that patients in Group 1 would receive only a placebo (naloxone – a narcotic antagonist), whereas those in Group 2 would receive either a narcotic or the placebo. The only difference between the patients in both groups who received the placebo was the clinicians’ knowledge. Dentists knew Group 1 patients received no active treatment, with Group 2 patients there was a known chance of active treatment. Interestingly pain reduction for those who received the placebo in Group 2 was significantly greater than in Group 1. It was concluded that the dentist’s expectations influenced placebo analgesic effects.<sup>8</sup> Simply stated, under this expectation model clinician and patient confidence that there will be good results is one important mechanism that mediates the placebo response.

- **Classical conditioning.** This mechanism has been demonstrated in both animal and human studies. For example, Voumouris, Peck et al. observed placebo effects of reduced pain in response to a neutral cream following conditioning trials in which the cream had been associated with pain reduction.<sup>9</sup> However conditioning and expectation are both combined in producing placebo responses in clinical practice. In the words of Finniss, Kaptchuk et al.:

“The most reasonable interpretation of recent publications is that conditioning follows expectation and is dependent on the success of the first encounter. This notion leads to the possibility that the first encounter is crucial for the development of subsequent robust placebo responses; the higher the expectation, the greater the placebo effect, and potentially the greater the conditioning effects associated with future (similar interventions).” This applies equally to drugs, or spinal manipulation, or other interventions.

b) **Neurobiological mechanisms.** Placebo effects have been demonstrated to occur in several different physiological systems in health volunteers and patients with many conditions. However most research into the neurobiology of placebo responsiveness has addressed placebo analgesia – and specifically in the area of opioid and non-opioid mechanisms. Finniss, Kaptchuk et al. observe:

- The body’s natural production of endogenous opioids seems to be involved in some placebo analgesic effects. This is shown by several studies demonstrating that “placebo effects can be completely or partly reversed by the opioid antagonist naloxone.”
- Other studies indicate that this release of endogenous opioids as a placebo response mechanism can occur at specific body regions, with “highly specific....release rather than a

more generalized opioid release (such increased opioid concentration in the cerebrospinal fluid)”.

- These results have been substantiated and extended by brain imaging techniques such as PET and functional MRI. In one PET study brain changes in response to placebo were reported to be similar to changes seen after treatment with an opioid drug.

- Opioid-mediated placebo responses also extend beyond pain pathways. Some studies have shown that placebo-induced respiratory depression (a conditioned placebo side-effect) and decreased heart rate and  $\beta$ -adrenergic activity can be reversed by naloxone.

8. **Enhancing the Effectiveness of Active Treatments.** Placebo effects can dramatically enhance the effectiveness of active treatments, often shown with medications. In a recent trial by Kam-Hansen, Jakubowski et al.<sup>11</sup> of patients with episodic migraine, there were these two interesting findings. First, there were similar results for patients who took the active medication rizatriptan labeled placebo, and those who took placebo pills deceptively labeled rizatriptan. Second, when the active drug was correctly labeled rizatriptan its analgesic effect was increased by 50%.

9. **Relief vs Cure.** Though placebo effects provide relief from many conditions they seldom cure. In the Wechsler, Kelley et al. asthma trial the clinical improvement reported by

**Table 1 Mechanisms for Placebo Effects in Medical conditions and Physiological Systems**

**Mechanisms**

*Pain* – Activation of endogenous opioids and dopamine (placebo); activation of holecystokinin and deactivation of dopamine (nocebo)

*Parkinson’s disease* – Activation of dopamine in the striatum and changes in activity of neurons in basal ganglia and thalamus

*Depression* – Changes of electrical and metabolic activity in different brain regions (eg, ventral striatum)

*Anxiety* – Changes in activity of the anterior cingulate and orbitofrontal cortices; genetic variants of serotonin transporter and tryptophan hydroxylase 2

*Addiction* – Changes of metabolic activity in different brain regions

*Autonomic responses to deep brain stimulation* – Change of neuronal excitability in limbic regions

*Cardiovascular system* – Reduction of  $\beta$ -adrenergic activity of heart

*Respiratory system* – Conditioning of opioid receptors in the respiratory centres

*Immune system* – Conditioning of some immune mediators (eg, interleukin 2, interferon  $\gamma$ , lymphocytes)

*Endocrine system* – Conditioning of some hormones (eg, growth hormone, cortisol)

*Physical performance* – Activation of endogenous opioids and increased muscle work

*Alzheimer’s disease* - Prefrontal executive control and functional connectivity of prefrontal areas

From Finniss, Kelley et al., Lancet, 2010

patients was equally great with both placebos (placebo inhaler and sham acupuncture) and the active treatment (inhaled albuterol.) However the situation was different with repeated measurements of maximum forced expiratory volume in one second. Albuterol resulted in a 20% increase in FEV, significantly higher than the approximate 7% improvement with either placebo. To quote Kaptchuk and Miller:

“The evidence to date suggests that the therapeutic benefits associated with placebo effects do not alter the pathophysiology of diseases beyond their symptomatic manifestations; they primarily address subjective and self-appraised symptoms. For example, there is no evidence that placebos can shrink tumors; however, experiments demonstrate that common symptoms of cancer and side effects of cancer treatment (e.g., fatigue, nausea, hot flashes, and pain) are responsive to placebo treatments... This conclusion tracks evidence related to many conditions, such as musculoskeletal, gastrointestinal, and urogenital disorders.”

**10. Ritual vs Patient-Practitioner Relationship.** We have seen that both of these are important in generating placebo responses. Which is more important? This question is addressed in a recent RCT from Kaptchuk, Kelley et al.<sup>10</sup> for patients with irritable bowel disease. This adopts the improved trial design for placebo already mentioned in the asthma trial by Wechsler, Kelley et al. A population of 262 adult patients was randomly assigned to one of three groups for 3 weeks:

- Observation only. Patients were assessed and placed on a waiting list.
- Limited placebo. Patients received sham acupuncture only – a validated placebo acupuncture device in which the needle retracts into the handle.
- Augmented placebo. Patients received the sham acupuncture in a patient-practitioner relationship augmented by warmth, attention and confidence.

After 3 weeks half of the patients continued in their originally assigned groups for a further 3 weeks. Results were measured at 3 and 6 weeks using 4 self-reported measures – global improvement scale (1-7), adequate relief of symptoms, symptom severity score and quality of life. Scores on global improvement at 3 weeks were 3.8 (observation), 4.3 (limited placebo) and 5.0 (augmented placebo). Other outcome measures/results showed the same trend. The proportion reporting adequate relief was 28% (observation), 44% (limited placebo) and 62% (augmented placebo). There was a significant difference between limited and augmented placebo on all outcomes, and results were similar at 6 week follow up. The researchers note that the effect size of 62% of patients reporting adequate relief is similar to the improvement seen in patients treated with the active medication alosetron in RCTs of irritable bowel syndrome.

Kaptchuk, Kelley et al. conclude that “non-specific effects can produce statistically and clinically significant outcomes and the patient-practitioner relationship is the most robust component.”

## D. Promoting Placebo Effects in Chiropractic Practice

11. Patients most frequently consult a chiropractor for neuromusculoskeletal problems causing pain (e.g. back pain, headache, pseudo-angina) or other symptoms (e.g. digestive

and respiratory dysfunctions). These are often recurring or chronic problems. Such patients need care on a biopsychosocial model that combines:

a) Specific or direct treatment effects. These are now established for chiropractic manual treatments including joint adjustment – effects such as restoring joint position and ranges of motion, reducing pain and disability, reducing soft-tissue tension and tenderness to pressure, and altering somatovisceral reflexes.

b) The greatest non-specific or placebo effects possible. These effects are indirect in the sense that, while they originate in part from the clinician and what he/she does, they operate through the emotions, responses and natural healing powers of the patient.

12. What elements in the art of chiropractic practice encourage placebo or non-specific benefits, and what should a chiropractor do to enhance these? On the basis of practice observation by Coulehan,<sup>12</sup> Jamison,<sup>13</sup> and Coulter<sup>14</sup> and patient studies by Cherkin<sup>15,16</sup> these seem to be the key points:

a) **Confidence and commitment.** Perhaps the single most influential placebo aspect of the clinical encounter is the chiropractor's confidence, formerly derived from clinical experience and a grounding in the philosophy and principles of chiropractic practice but now from research evidence also. This is an important source of non-specific treatment effects because:

- i) With this perspective chiropractors generally tend to be more comfortable and confident of a real cause, jointsubluxation/dysfunction and its biomechanical and neurological effects, that they can address with tangible treatments and advice.
- ii) There can be an immediate plan of treatment rather than “let's wait and see”.
- iii) These factors give the patient confidence and expectation of success.

Additionally, as Shapiro and Shapiro observe,<sup>17</sup> the clinician's commitment is often interpreted by patients as increased interest in them.

b) **Information and advice.** The information patients are given regarding their conditions, both the content and format, is reported by them as a strong point in the chiropractic encounter.<sup>12,15</sup> Coulter, as a sociologist who has studied the profession at length, agrees. He sees the high quality of communication by doctors of chiropractic and their staff members during the office visit and whole clinical encounter as the key to the high rate of patient satisfaction the profession achieves. Quality communications are achieved through three methods:

- Concrete and clear language that demystifies the problem and is easily understandable. Much use is made of analogies (e.g. correcting a mechanical health problem similar to wheel alignment of a vehicle.)
- Visual Aids – virtually all chiropractors use printed materials, charts and skeletal models to reinforce explanation.
- Hands-on examination – this plays a powerful role. As chiropractors use skilled palpation with patients to reproduce pain and find stress points not previously detected by the patient “this provides powerful and instant confirmation that the chiropractor knows and understands the human body” says Coulter.

The net effect, in the words of another researcher Coulehan,

“is a logical set of explanations which appeal to common sense, use scientific terminology, yet promote a natural, non-invasive, holistic approach to healing.”

**c) The laying on of hands.** Chiropractic practice involves “the laying on of hands”, both in examination and treatment, and this is generally regarded as having non-specific effects at least as strong as medication or surgery. In addition the actual adjustment or manipulation typically produces an audible release. To most patients this provides obvious and tangible evidence of value. Something that was previously ‘out’ is now ‘in’. (The noise is, of course, merely the collapse of a nitrogen gas bubble released from the synovial joint during gapping).


**d) Time and attention.** Beyond confidence and empathy, patients respond to adequate time and a fuller history on a first consultation, generally a feature of chiropractic care. Dossett, Mu et al. have just provided further evidence of the importance of these matters in another Harvard-based RCT<sup>18</sup>. In this, involving 24 patients with gastroesophageal reflux disease randomly assigned to groups receiving either the homeopathic product Acidil or a placebo pill, there was no difference between groups on the patient-reported outcomes of symptoms, symptom severity and quality of life recorded over two weeks in a daily diary. However the one provider in the trial gave two types of patient-provider consultation at the beginning of the study. These were ‘standard’ and ‘expanded’ consultation visits. Both were thorough and empathetic, but in the expanded visit there was more time given and additional questions asked. Patients who received the expanded visit were significantly more likely to report a 50% or greater improvement in symptom severity.

13. In summary, to generate non-specific effects and enhance the specific effects of treatment in chiropractic practice, it is important for clinicians to appear confident, enthusiastic and

caring, to emphasize manual contact in diagnosis and treatment and, through information and advice and otherwise, to give patients confidence, expectation of success and a new sense of control over their problems.

## E. Conclusion

15. Because of its tainted history and lingering sceptical attitudes and misunderstandings some have suggested replacing the concept of placebo effects with alternative ones, such as ‘context effects’ or ‘meaning responses’. However, as Finniss, Kaptchuk et al. conclude, “placebo terminology, despite its defects, is too engrained in the scientific literature to replace it at this time.”

So what is an evidence-based attitude towards placebo after the research developments of the past decade? Current research and pronouncements from healthcare leaders make it clear that placebo effects are present to a greater or lesser degree in all healthcare encounters and are to be harnessed and celebrated. They are not only legitimate and important - they lie at the very heart of all healing. 

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