

Back To Chiropractic CE Seminars

How to Write a Case Study ~ 6 Hours

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This course counts toward your California Board of Chiropractic Examiners CE. (also accepted in other states, check our website or with your Chiropractic State Board)

The California Board requires that you complete all of your CE hours BEFORE the end of your Birthday month. We recommend that you send your chiropractic license renewal form and fee in early to avoid any issues.

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If you get audited and lose your records, I'll have a copy.

I'm always a phone call away... 707.972.0047 or email: marcusstrutzdc@gmail.com

Marcus Strutz, DC

Back To Chiropractic CE Seminars

33000 North Highway 1

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HOW TO WRITE A CASE STUDY FOR CHIROPRACTORS

Kim B. Khauv, DC MPH

References:

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- *Chiropractic Research: How to write a case study*
Richard A. Pistolese
Research Director, Future Perfect Inc.
- *Writing Your Case Report*
Lisa Zaynab Killinger, DC
Palmer Center for Chiropractic Research
- *A Tutorial for Case Studies*
Journal of Vertebral Subluxation Research
A Peer-Reviewed Scientific Journal

**How many times have you read a case report in a chiropractic research journal and said,
"I had a patient just like that!" ?**

Or...

How many times have you witnessed the power of an adjustment in your own office and wished you could share the details with the entire profession?

How long will you
keep it a secret?

Case reports are an essential part of chiropractic research and journals are always looking for well-prepared case reports from field doctors like yourselves.

Journals like...

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- Journal of Manipulative and Physical Therapy (JMPT)
- Journal of Vertebral Subluxation Research (JVSR)
- Spine

Just to name a few...

The case report provides an important link to the research arena.

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However, no conclusions are drawn from a case report can be generalized to the public, nor can “cause and effect” statements be made.

This is the first thing to realize.

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Our colleges, research facilities and organizations are important, but chiropractic research cannot progress without the input of independent field doctors, like yourselves.

You may be wondering...

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What kind of research can
you possibly do in your own
office?

The very Patients that walk through your doors are perfect study subjects.

We need reports from the field about the people you are taking care of and how they respond to what you do.

Studying how chiropractic helps them in their specific situations can teach us a great deal.

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Don't feel that your case must include some dramatic life threatening illness that the patient recovered from.

Case reports are needed on every aspect of chiropractic care.

For instance, one doctor recently cared for a 41 year old male who suffered from migraine headaches.

His case report, published in a major research journal, detailed the case and the positive changes documented in this patient while under chiropractic care.

Another paper discussed the management of a case of knee pain in a 35 year old male patient.

These are the same types of patients with the same health situations that you probably see in your own practice every day, responding in similar ways to subluxation correction.

Imagine if 100 chiropractors reported successful results following subluxation reduction in a patient who had AIDS, or ear infections, scoliosis or whatever.

Those 100 case reports collectively represent data that can be used to educate patients, the public, other healthcare providers, government, third parties etc., on the merits of chiropractic care.

- The current and future atmosphere of Evidence Based Healthcare model.
- If your technique or protocol does not publish, in the eye of the healthcare system and perhaps the public, you don't exist.

Chiropractic's Current State: Impacts For The Future

Robert D. Mootz, DC Editorial, JMPT Jan 2007;30:1-3

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The chiropractic profession is currently facing a shift in practice and health care environments. This editorial reflects on the current state of the profession and suggests that the profession should move from the thinking and practice styles of the past that primarily attempted to *prove* patient care and practice to a more productive approach that strives to *improve* patient care and practice.

Chiropractic's Current State: Impacts For The Future

Robert D. Mootz, DC Editorial, JMPT Jan 2007;30:1-3

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The following primary areas that require attention are discussed:

- (1) evidence-based and best practices-oriented research priorities;
- (2) constructive engagement of the greater health care system; and
- (3) successful ethical business models.

So let's get to it!

What is a Case Report?

So what is a Case Report?

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A case study/report is a detailed report of the symptoms, signs, diagnosis, treatment, and follow-up of an individual patient. Case reports may contain a demographic profile of the patient, but usually describe an unusual or novel occurrence.

A Case Study...

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- is a detailed description of a subject, unit, or event.
- should educate or share important experiences with others
- is the foundation for future studies
- is “healthcare story telling”

There are inherent limitations to case report:

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- Not generalizable
- Describes what happened in one case, nothing more.
- Does not rule out placebo effect
- Does not prove effectiveness of treatment

What is a Retrospective Case Report?

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- **A case report that looks back of your completed cases or care.**

There are inherent limitations to Retrospective Case Reports:

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- May not have great notes
- May not have pre and post measurements set
- May not have other variables controlled (exercise programs, massage, etc.)

HOW TO ORGANIZE AND WRITE A CASE REPORT

A case report could include the following headings and/or categories:

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- Title
- Abstract (written last)
- Introduction
- Case report/Methods
- Intervention and Outcome
- Discussion
- Conclusion
- Acknowledgements (if applicable)
- References
- Tables

THE INTRODUCTION

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- Introduces the case/condition of interest
- Reviews and cites the scientific literature on the topic (Chiro./Non-chiro. Lit.)
- States the etiology/common treatments/prognosis
- Includes recent, high quality references (articles are better than books!)

THE INTRODUCTION

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- It could consist of two to four paragraphs as to why this case is important.
- If you were writing about the effects of subluxation reduction on a child with cerebral palsy you might want to discuss the condition in general.
- The same would be true with more mundane topics as neck pain, headaches and other neuromusculoskeletal conditions.

THE INTRODUCTION SHOULD ANSWER:

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- What is the condition? How is it diagnosed?
- How many people have it? (prevalence, incidents)
- Who are the high risk groups or those commonly affected?(gender, age)
- What are the common treatments?
- What are alternative treatments?
- How much does it cost US healthcare system respectively?
- How is chiropractic and this condition related?
- Has chiropractic been shown to help?

THE INTRODUCTION

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Did you answer?

- **What is known about the condition of interest?**

Example of Introduction Section co-authored by Dr. Khauv

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Introduction

Amenorrhea can be categorized into primary and secondary amenorrhea. Primary amenorrhea is defined as failure of menarche by age 16 years while exhibiting secondary sexual characteristics.¹ Secondary amenorrhea is defined as cessation of menses for a minimum of three months or more in women who have experienced previous menses.²⁻⁴

Secondary amenorrhea is more common than primary amenorrhea^{5,6} with a prevalence of approximately 3.3% in women of child-bearing age.⁷

Some common differential diagnoses of secondary amenorrhea are pregnancy (the most common cause),⁸ thyroid disease, and hyperprolactinemia.⁵ Once these conditions are ruled out, amenorrhea is thought to be caused by anatomical,

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Ko M, Khauv K, Alcantara J. Resolution of Secondary Amenorrhea of 20 Years in a 39-year-old Undergoing Subluxation-Based Chiropractic Care: A Case Report. J Pediatr Matern & Fam Health – Chiro. 2012;(2):38-42.

genetic and neuroendocrine abnormalities.³ Conditions that can cause secondary amenorrhea are exercise-related female athlete triad (eating disorder, amenorrhea, and low bone mineral density),^{9,10} eating disorders,^{6,11} injectable progestogen contraceptive,¹² and polycystic ovary syndrome.¹³ Long term effects of secondary amenorrhea may include bone loss,¹⁰ psychological conditions including anxiety, altered self-image, and loss of self-esteem along with health issues related to low estrogen including low libido, hot flashes, and lack of energy.¹⁴ Psychological issues are especially evident in women who want to conceive but cannot due to amenorrhea.¹⁴

Intervention for secondary amenorrhea are based on the diagnosis of the root cause including gonadotropin therapy in women with pituitary-caused amenorrhea,¹⁴ estrogen therapy for women who are hypoestrogenic,⁸ and nutritional intervention for patients with eating disorders.¹⁰ In the realm of chiropractic care, evidence of resolution of primary and secondary amenorrhea are limited to a few case reports/series¹⁵⁻¹⁷ and a clinical trial.¹⁸ To address this deficit and in the interest of evidence-based practice, we report on the successful chiropractic care of a woman with secondary amenorrhea.

Ko M, Khauv K, Alcantara J. Resolution of Secondary Amenorrhea of 20 Years in a 39-year-old Undergoing Subluxation-Based Chiropractic Care: A Case Report. *J Pediatr Matern & Fam Health – Chiro*. 2012;(2):38-42.

THE CASE REPORT

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This section should detail the pertinent history, chief complaint (if there was one) and exam findings regarding the case under discussion.

THE CASE REPORT

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- Give biographical information about the patient if appropriate.
- Do Not use the patient's name or your name or write in first person.
- Instead use: “the patient”, “the treating chiropractor”, “the chiropractor”, etc.
- You want to describe the type of methodology you used to find and characterize the subluxation(s), the techniques you used, the type of subluxation(s) addressed and the levels.

THE CASE REPORT

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- It's important for chiropractic research to focus on subluxation reduction and correction as an outcome in and of itself.
- So in a case like this, you want to discuss the findings that led you to your diagnosis of subluxation in that patient and how those parameters improved following administration of care.

For example, maybe you are an upper cervical practitioner and rely on the use of radiographic measurements, leg checks, and thermography as subluxation indicators and outcome assessment. Discuss your findings pre and post adjustment or throughout the duration of care.

THE CASE REPORT

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Did you answer?

- **How did the patient present, what were your exam findings, and what was your clinical impression?**

Example of Case Report co-authored by Dr. Khauv

Case Report

A 39-year-old Asian-American female presented to a chiropractic college health center with complaints of severe mid- and low back pain, referring into the left leg as well as headaches. Using written and verbal self-report, she rated her pain complaint as 9/10 for her low back pain, 6-7/10 for her mid-back pain, and 6-7/10 for her headaches. She reported that her pain complaints were present “every waking hour.”

She reported a history of secondary amenorrhea, experiencing heavy flow and painful cramps every 3-4 months since the age of 18 years. She was prescribed low-dose estrogen at age 37 and 39 to induce menses. Her attempts to conceive in the last four years were unsuccessful which caused her a great deal of anxiety. Review of systems indicated a medical history of anxiety attacks, asthma, benign breast fibroid, leg edema, weight gain, tension- and sinus-type headaches, and seasonal allergies.

In addition to taking her medical history, a comprehensive physical examination was performed, including range of motion (ROM) evaluation, vital signs, neurological examination and chiropractic examination utilizing manual kinesiological muscle testing,¹⁹ static and dynamic digital palpation and spinal orthopedic testing. At the physical examination, the patient was 5 feet 1 inch in height and weighed 230 lbs. Her vital signs were within normal limits.

Example of Case Report co-authored by Dr. Khauv

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Examination findings revealed a short right leg by ¼” in the prone position and a positive right Derefield Test. The short leg on the right side indicated asymmetrical muscle contraction of paraspinal musculature. Neurological tests including deep tendon reflexes and dermatomal sensation were within normal limits. Further orthopedic testing revealed a positive Fabere-Patrick test on the left side and a positive left Belt Test indicative of sacroiliac dysfunction. The patient also demonstrated positive testing on the right side during the Gillet’s Standing Test indicative of fixation of the right upper

39 J. Pediatric, Maternal & Family Health - April 2, 2012

Ko M, Khauv K, Alcantara J. Resolution of Secondary Amenorrhea of 20 Years in a 39-year-old Undergoing Subluxation-Based Chiropractic Care: A Case Report. J Pediatr Matern & Fam Health – Chiro. 2012;(2):38-42.

quadrant of the sacroiliac joint with active motion.²⁰

Cervical spine ROM examination revealed decreased ROM on cervical flexion, extension and on rotation, bilaterally. Lumbar spine ROM examination revealed restrictions on flexion, extension, and left lateral flexion, all with localized pain reported at the left sacroiliac joint. Postural analysis revealed elevation of the left ear, left shoulder, and right hip when compared with the contralateral sides.

On lateral view, the patient demonstrated an anterior head carriage by approximately 1 ½" from the vertical axis. On anterior-posterior view, the patient's right shoulder appeared internally rotated, indicating asymmetrical muscular tone of the spine. Digital palpation findings revealed taut and tender paraspinal muscle fibers on the right side throughout the cervical spine from C2-C7 vertebral levels. The right paraspinal muscles from the third thoracic vertebra to the lumbosacral spine and extending to the sacroiliac joint were hypertonic. On digital motion palpation, the left sacroiliac joint was fixated when compared to the right.

Based on the history and physical examination, radiographic examination was performed of the lumbopelvic spine. Spinographic analysis revealed malposition of the left innominate according to the Gonstead protocol of spinography.²¹

Evidence of osteoarthritis including loss of disc space, osteophytic formation and facet arthrosis were present in all lumbar segments. The patient was informed of an initial clinical impression of vertebral subluxation complex of the cervical, thoracic, lumbar spine and pelvis, facet/sacroiliac referral, and lumbosacral osteoarthritis. The patient consented to a trial of chiropractic care, focusing on the location and correction of vertebral subluxation.²²

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INTERVENTION

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For Intervention:

- You should discuss what type of care was instituted. This is one of the most important parts of a case study.
- Document the care in such a way that the procedures performed are readily identifiable

INTERVENTION

- This section must describe the care given in enough detail that the reader could easily duplicate the care. (And, hopefully, duplicate your outcomes!)
- Hypotheses regarding the literature onto why this care plan was chosen.
- Your experience with this kind of case.

INTERVENTION EXAMPLE

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“The patient was adjusted 7 times over a 3-week period using the Activator.”

- Strengths
- The author not only described how many times the patient was adjusted but also reported over what period of time these adjustments were delivered.
- Weaknesses
- Although the reader may know what an Activator is, it is unclear whether or not the author of this case study used the Activator in a generic manner (as a substitute for manual spinal manipulation) or if the author followed Activator Methods Chiropractic Technique (AMCT) protocols.

INTERVENTION

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- Revision
- “The patient was adjusted 7 times over a 3-week period by using the Activator Methods Chiropractic Technique (AMCT) protocol as described by X (cite an Activator Methods manual or textbook).”

The Journal Article Cookbook Gleberzon B, Killinger L JMPT Volume 27, Issue 7, Pages 481-492 (September 2004) <http://www.jmptonline.org/article/PIIS0161475404001356/fulltext>

INTERVENTION

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“Adjustments of the atlas were given 3 times during the first week of care.”

- Strengths
- The authors were very specific about how many times the patient was adjusted during the first week of care. Unfortunately, some authors often omit such important information.

The Journal Article Cookbook Gleberzon B, Killinger L JMPT Volume 27, Issue 7, Pages 481-492 (September 2004) <http://www.jmptonline.org/article/PIIS0161475404001356/fulltext>

INTERVENTION

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“Adjustments of the atlas were given 3 times during the first week of care.”

- Weaknesses
- What's an atlas and how was it adjusted?

The Journal Article Cookbook Gleberzon B, Killinger L JMPT Volume 27, Issue 7, Pages 481-492
(September 2004) <http://www.jmptonline.org/article/PIIS0161475404001356/fulltext>

INTERVENTION

“Adjustments of the atlas were given 3 times during the first week of care.”

Revision

- “The patient received chiropractic adjustments (Upper Cervical Technique) to the first cervical vertebra or atlas on the first, third, and fifth days of this study. In particular, the author adjusted the patient by using the Toggle Recoil Technique. These adjustments were performed with the subject recumbent on his right side, on a Toggle Recoil table. The doctor's stance was always in front of and facing the subject, with the shoulders centered over the subject's involved spinal vertebra.

INTERVENTION

Revision (continue):

- The thrust was delivered through the pisiform of the doctor's left hand. The doctor delivered a quick, shallow thrust in the direction appropriate for the correction of the first cervical vertebra (atlas). The contact point was the patient's left transverse process of the atlas.” (Killinger 1995)

INTERVENTION

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Did you answer?

- **What did you do, when, how, for how long and why?**

Intervention

The patient attended a total of 25 chiropractic visits in a period of 8 months at an initial treatment frequency of twice a week for the first 6 weeks and once a week for the next 12 weeks. On the patient's first visit, the patient received chiropractic adjustments utilizing Diversified Technique characterized as high-velocity, low amplitude (HVLA) thrusts. Subluxation listings were established using a combination of Gonstead spinography,²¹ static and motion palpation, as well as kinesiological manual muscle testing to locate areas of vertebral and muscle dysfunction.^{19,23}

Evaluation and adjustments of the lumbopelvic region were performed using the Gonstead chiropractic technique whereas the rest of the spine was evaluated and adjusted using Diversified technique.²⁴ The practitioner determined the following subluxation listings at the first visit: a left internally rotated ilium (IN-ilium), a right posterior sacrum (P-R), and a posterior, right, and inferiorly fixed spinous process of the fifth lumbar vertebra (PRI-m L5).

To perform the ilium adjustment, the patient was lying with her left side up on a pelvic adjusting bench. The practitioner stood in front of the patient and contacted the medial aspect of the posterior superior iliac spine of the left ilium with her right

pisiform, stabilizing the patient's left shoulder with her left hand. A HVLA specific thrust was delivered in the line of correction to reduce the internal rotation, pushing in a medial to lateral direction.

The fifth lumbar and the right sacrum were adjusted using similar side-posture body positioning to correct for the measured misalignments. The same adjustments were performed on the second and third visit. At each subsequent visit thereafter, full-spine evaluation and adjusting of the cervical, thoracic, lumbar spine and pelvis were performed.

Thoracic adjustments were delivered with the patient in the prone position in which the practitioner contacted the transverse process of the thoracic vertebra to be adjusted with the pisiform using primarily posterior to anterior thrusts, as well as cervical adjustments performed with the patient in a seated position with the practitioner contacting the lamina-pedicle junction of the cervical vertebra with the lateral aspect of the distal interphalangeal joint of the index finger. The attending intern also utilized a stationary Omni Drop Table (Omni Manufacturing and Design, Inc. East Bradenton, Florida) for lumbopelvic adjustments during half of the visits.

Example of Intervention Section co-authored by Dr. Khauv

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The iliopsoas, gluteus maximus, and piriformis muscles were found to be conditionally inhibited when tested manually and were re-facilitated using chiropractic adjustments, myofascial, neurolymphatic and meridian therapy. Active neurolymphatic reflex points were found on the tensor fascia lata muscle and PSIS and were reduced by manual flushing using strong, circular pressure on the points for approximately 20-30 seconds.^{19,23}

Adjunctive care for the patient was added to the patient's management plan at the third week to support a lifestyle that would promote healing and optimal function, including an anti-inflammatory diet (avoiding consumption of sugars, refined foods, dairy, gluten, alcohol and caffeine to reduce inflammation and ensure proper nutrition) as well as walking for 30 minutes a day to promote circulation, maintain healthy biomechanics and proprioception in the spine, and active stretching of the cervical and lumbar spine in all ranges of motion 2-3 times a day to increase mobility.²⁵

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OUTCOME

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For Outcome:

- **Describe the changes observed in the pt.**
- **Lists results on outcome measures used (I.e: Rand-36 or Visual Analog scores)**
- **Describes changes in health status, pain, symptoms, unexpected results, etc.**

OUTCOME

56

Unexpected results are great:

- **A patient's chief complaint was lower back pain but now he shares that his allergies are better, sleeping better, thinking straighter, can run faster, etc.**
- **These unexpected results should be listed in the outcome section.**
- **These unexpected results can now allow other's use your published case study as a reference for those unexpected results.**

The Outcome (Results) Section Answers:

- **How did you document change (positive or negative results) in this case?**

Outcome

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After the first adjustment the intern performed a comparative examination, finding decreased paraspinal tenderness and increased intersegmental motion of the left sacroiliac joint and L5 vertebral body. The patient reported a decrease in low back pain immediately after the first adjustment and described a pleasant “tingling in the spine.”

Following the second visit, the patient informed the attending intern that she had experienced the onset of her first menstrual cycle in 3 months. The patient reported heavy menstrual flow, acne, and food cravings, which the patient had not experienced with previous menstrual cycles.

At the time of this writing, the patient had experienced seven menstrual cycles within eight months since initiating chiropractic care, with varying levels of flow and menstrual cramps lasting between four to seven days. Pain severity had

Example of Outcome Section co-authored by Dr. Khauv

decreased from 9/10 to a 5/10 by the third visit her low back pain.

At the progress re-evaluation at the 6th week of care consisting of 12 visits, the patient reported that her low back pain was 6-7/10 (comparative rating of 9/10 pre-chiropractic care) once a week, mid-back pain was 6-7/10 (6/10 pre-chiropractic care) once a week, and headaches were a 2-4/10 (6-7/10 pre-chiropractic care) once every two weeks.

The patient also reported fewer anxiety attacks, asthma attacks, congestion, as well as improved sleep, and increased levels of energy. The patient's reported reduction in symptomatology and re-establishment of regular menstrual cycle is consistent with previous literature describing similar outcomes with patients under chiropractic care.^{4-6,10}

THE DISCUSSION

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- **Interpretations of your findings**
- **The reasons for your results**
- **Comparison of your case with other studies (The ones cited in your intro!)**
- **Rationale for management plan**
- **Discussion of at least 3 limitations/flaws in your study**
- **Variables that aided or limited your results**

THE DISCUSSION

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- **Discuss possible reasons for the results you observed (other variables, placebo, etc.)**
- **Review any chiropractic literature related to this condition. Perhaps others have written on the topic and have seen similar results as you.**
- **You could conclude this section by making hypotheses regarding the literature and your experience with this case.**

THE DISCUSSION

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The Discussion Section Answers:

- **How does your case confirm/refute previous studies on this topic, why did you do what you did, why do you think are the reasons for your results and what are the limitations?**

Discussion

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This case study reported benefits in a female patient undergoing chiropractic care with a history of secondary amenorrhea. The outcomes of this study may provide additional evidence in support of the limited body of amenorrhea-related chiropractic literature.¹⁵⁻¹⁸

Gauthier and Mullin¹⁵ described beneficial results of Gonstead chiropractic care in a 25-year-old female with primary amenorrhea and attributed the results to “neurovertebral influence” on the nervous system.²⁶ Curtis and Young¹⁶ reported on chiropractic management of two idiopathic secondary amenorrhea cases. The authors discussed the possible association of the patients’ thoracic subluxations and their corresponding sympathetic nerve roots influencing the suprarenals at the vertebral levels of T8-L1.

Example of Discussion Section co-authored by Dr. Khauv

Sacral Trauma

Goodsell and Shtulman¹⁷ managed a chiropractic case involving a 21-year-old female with secondary amenorrhea following sacral trauma. The authors hypothesized that chiropractic adjustments correcting subluxations could improve neurologic function and correct the mechanoreceptive afferent input to the central nervous system thereby normalizing autonomic function. The patient's menstrual cycle returned after 12 weeks of chiropractic care to remove subluxations.

In the current case study, following two consecutive patient visits in a period of two days, adjustments to the lumbopelvic spine resulted in the initiation of the patient's menstrual cycle.

Chiropractic adjustments delivered at the initial visits focused on the lumbopelvic region. The theoretical framework of this approach involved the idea that menstrual function was likely affected due to the complex neuro-anatomy innervating the reproductive organs with peripheral nerves originating from the mid-lower thoracic vertebra to the sacrum.²⁷

SI Joint Involvement

There is the possibility that a relationship exists between sacroiliac joint dysfunction and amenorrhea.²⁸

Example of Discussion Section co-authored by Dr. Khauv

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As more comprehensive, full-spine evaluation and adjustments were implemented in the patient's care, she experienced improvement in many other aspects of her health including musculoskeletal pain, asthma, mood and energy. Furthermore, this full-spine approach resulted in reported reduction of regional musculoskeletal symptoms as well as improvement in overall function and general health.

Although the reported outcome for the patient described in this case report was positive, limitations in the study must be acknowledged. The first limitation is that the effects of placebo cannot be discounted in this study. Note that patient compliance to specific care recommendations were also a major limiting factor.

At the second month of care, the patient self-elected to make appointments once every two to three weeks due to personal financial limitations resulting in only 25 visits out of the 48 recommended visits. With the decrease of visit frequency, the patient experienced periodic aggravation of her musculoskeletal complaints and other conditions (i.e., increase in asthma and anxiety attacks, stress, and headaches).

Example of Discussion Section co-authored by Dr. Khauv

After receiving the intern's dietary recommendations focusing on an anti-inflammatory diet avoiding consumption of sugars, refined foods, dairy, gluten, alcohol and caffeine, the patient reported attempts to "eat healthier" such as including more salads and fruits in her diet, but continued to eat pro-inflammatory foods such as dairy, refined sugar, and gluten.

Health complications that occurred during the period of chiropractic care included an emergency room visit for a bout of severe asthma mid-way through her care. The patient was medicated with Prednisone.

She also experienced a sinus infection that was treated medically with antibiotics, and severely high levels of stress and grief due to her work environment and a death of a close relative. The patient was also required to frequently work extensive hours of over-time at work that interfered with her ability to rest, exercise, and heal. Despite the patient's sub-optimal care plan compliance and complicating lifestyle factors, she still experienced 7 menstrual cycles in the period of 8 months of care.

THE CONCLUSION

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- **Tells the reader what was learned through this case**
- **Describes why the case is significant**
- **Suggests a direction for future studies.**
- **Don't make unsubstantiated claims!!!**

THE CONCLUSION

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“I will never write any phrase that resembles: This study shows that chiropractic is an effective treatment for anything!”

The Journal Article Cookbook Gleberzon B, Killinger L JMPT Volume 27, Issue 7, Pages 481-492 (September 2004)

<http://www.jmptonline.org/article/PIIS0161475404001356/fulltext>

THE CONCLUSION

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The Conclusion Section Answers:

- **What was learned from this study and what is the next step in studying this topic?**

Conclusion

We reported the successful chiropractic care in a patient complaining of musculoskeletal complaints, headaches and long-term secondary amenorrhea. Given the long-term effects of secondary amenorrhea (i.e., bone loss and psychological dysfunction), we support and strongly encourage further research on the chiropractic care of similar patients.

THE ABSTRACT

The abstract or synopsis summarizes the main points of the case study including: (1) the purpose of the case report. (2) The basic procedures followed. (3) The main findings and (4) the principal conclusions. The abstract might include the following types of information:

THE ABSTRACT

- Objective: Why is the case study being presented?
- Clinical features: This should be a brief overview of the patient's presentation & diagnosis.
- Outcomes measures: What instruments were used to measure change?
- Intervention: What was done?
- Outcome: What happened as a result?
- Conclusions: This is a brief statement of what you feel the significance of the case is and future studies.

THE ABSTRACT

- Each of these sections should be 1-2 sentences
- Be succinct and concise
- Should attract readers
- No more than 250 words total

Example of an Abstract co-authored by Dr. Khauv

Abstract

Objective: To describe a patient with secondary amenorrhea, low- and mid-back pain, and headaches under chiropractic care.

Clinical Features: A 39-year-old female presented for chiropractic care with low- and mid-back pain, tension- and sinus-type headaches, and a 20-year history of secondary amenorrhea. The patient suffered from secondary amenorrhea with painful menses at 3-4 months per year since she was 18 years old. Low-dose estrogen was prescribed at 37 and 39 years of age to induce her menses. The patient's last menses was 3 months prior to initiating chiropractic care.

Intervention: The patient attended 25 visits over an 8-month period utilizing manual muscle testing and Diversified chiropractic adjustments (i.e., high-velocity, low-amplitude) to address sites of vertebral subluxations.

Outcome: Following the second visit, the patient reported experiencing her first menstrual cycle in three months. After 25 visits, the patient reported seven monthly menstrual cycles over 8 months of care, decreased musculoskeletal pain, and improved general health.

Conclusion: This case report provides supporting evidence that subluxation-based chiropractic care may benefit patients suffering from secondary amenorrhea. Future studies to examine the effects of chiropractic care on the factors and mechanisms of secondary amenorrhea should be initiated.

Keywords: *chiropractic, secondary amenorrhea, subluxation, manual muscle testing, Diversified, back pain, headaches*

Ko M, Khauv K, Alcantara J. Resolution of Secondary Amenorrhea of 20 Years in a 39-year-old Undergoing Subluxation-Based Chiropractic Care: A Case Report. J Pediatr Matern & Fam Health – Chiro. 2012;(2):38-42.

REFERENCES

75

- List all relevant references that support your case study report and the statements made therein.
- Although initially appearing tedious, guidelines exist on how to list the references and once you get going it's pretty simple and straightforward.

REFERENCES

- References should be numbered in the order they appear in the article
- References need to be listed immediately following any phrase from another author or article.
- All statements of facts *MUST* be referenced.
- Research articles are preferred, then textbooks, then manuals, popular press articles, etc.

REFERENCES

Style...Scientific Publications/Articles

- **Author's Last name then first initial, <comma> other authors <period> Title of article (only first letter capitalized) <period> *Name of Journal* (using standard abbrev and *italicized*) <period> year of publication <semicolon> volume number and issue number (issue # in parentheses) <colon> page numbers <period>**

REFERENCES

Example:

Hurwitz EL, Coulter ID, Adams AH, et al. Use of chiropractic services from 1985-1991 in the United States and Canada. *Am J Public Health.* 1998;88(5):771-776.

REFERENCES

Style Textbooks...

- **Author last name and first initial <period> *Name of Book* (Italicized; with each main word capitalized) <period> Edition number <period> City/country of publication <colon> Publisher's name <semicolon> Year of publication <colon> page numbers <period>**

REFERENCES

Style Textbooks...example:

- **Palmer DD, Palmer BJ. *The science of chiropractic; its principles and adjustments* , 1st ed. Davenport, IA: Palmer School of Chiropractic, 1906 . illus.: photos: xix, 413 [420] pp.**

References

1. Master-Hunter T, Heiman DL. Amenorrhea: evaluation and treatment. *Am Fam Physician*. 2006 Apr 15;73(8):1374-82.
2. Japan Society of Obstetrics and Gynecology, eds: *Glossary of obstetrics and gynecology*. A Revised Edition, 2003, Kanehara & Co., Ltd., Tokyo.
3. Crosignani PG, Vegetti W. A practical guide to the diagnosis and management of amenorrhoea. *Drugs*. 1996 Nov;52(5):671-81.
4. Practice Committee of the American Society for Reproductive Medicine. Current evaluation of amenorrhea. *Fertil Steril*. 2004 Sep;82 Suppl 1:S33-9
5. Master-Hunter T, Heiman DL. Amenorrhea: evaluation and treatment. *Am Fam Physician*. 2006 Apr 15;73(8):1374-82.
6. Abraham SF, Pettigrew B, Boyd C, Russell J. Predictors of functional and exercise amenorrhoea among eating and exercise disordered patients. *Hum Reprod*. 2006 Jan;21(1):257-61.

Some things NOT to do when writing your case study...

DO NOT!

- Write as if you are promoting your technique, product or clinic (case reports are not advertisements)
- Submit without you AND others proofreading your paper
- Use patient's or doctor's name
- Try to generalize your conclusions
- Say that you “proved effectiveness” of chiropractic!

Don't forget your abstract!

84

- Written last; after the paper is done.
- Includes a main idea/sentence or two from each section: Intro, Intervention, Outcome, Discussion, etc.
- Should be brief and succinct
- Catches reader's attention (Answers: Why should you want to read this paper?)

MEASUREMENT TOOLS

MEASUREMENT TOOLS

86

- Work with other professionals
- MRI / fMRI
- SF-36
- Index of Activities of Daily Living (Katz)

MEASUREMENT TOOLS

87

Outcome Measure Database

<http://www.csp.org.uk/director/effectivepractice/outcomemeasures/database.cfm>

MEASUREMENT TOOLS:

Index of Activities of Daily Living (Katz)

88

- Staff-completed measure, assessing independence in 6 activities rating each activity on a 3-point scale
- FREE
- Time to do: not stated
- <http://www.hartforddign.org/publications/trythis/issue02.pdf>

MEASUREMENT TOOLS:

Neck Disability Index

89

- The Neck Disability Index (NDI) was developed in 1989 by Howard Vernon. The Index was developed as a modification of the Oswestry Low Back Pain Disability Index with the permission of the original author (J. Fairbank, 1980). In 1991, Vernon and Mior published the results of a study of reliability and validity in the *Journal of Manipulative and Physiologic Therapeutics*.
- FREE
- Time to do (in minutes): 10
- Comparison of the Neck Disability Index and the Neck Bournemouth Questionnaire in a Sample of Patients with Chronic Uncomplicated Neck Pain *JMPT*2007 (May); 30 (4): 259–262
- http://chiro.org/LINKS/Outcome_Assessment.shtml#QA

MEASUREMENT TOOLS:

The Oswestry Low Back Pain Questionnaire

90

- The ODI remains a valid and vigorous measure and has been a worthwhile outcome measure. The process of using the ODI is reviewed and should be the subject of further research. The receiver operating characteristics should be explored in a population with higher self-report disabilities. The behavior of the instrument is incompletely understood, particularly in sensitivity to real change.
- FREE
- Time to do (in minutes): 10
- Spine 2000 (Nov 15); 25 (22): 2940–2952
- http://chiro.org/LINKS/Outcome_Assessment.shtml#QA

MEASUREMENT TOOLS:

The Quadruple Visual Analogue Scale

91

- This Adobe Acrobat file covers 4 characteristics of the Patient Complaint: Present Pain, Typical or Average Pain, and Pain Range at it's least and worst.
- FREE
- Time to do (in minutes): 10
- Responsiveness of Visual Analogue Scale and McGill Pain Scale Measures
JMPT 2001 (Oct); 24 (8): 501–504
- The results of this study suggest that the VAS may be a better tool than the McGill Pain Questionnaire for measuring pain in clinical trials and clinical practice.
- http://chiro.org/LINKS/Outcome_Assessment.shtml#QA

MEASUREMENT TOOLS:

The Roland–Morris Questionnaire

92

- The Roland-Morris instrument was developed as an abbreviated SIP (sickness index profile) and is specific for low back pain, like the Revised Oswestry Disability Index. This questionnaire of 24 items can be administered in five minutes and has been validated in randomized trials of spinal manipulation.
- FREE
- Time to do (in minutes): 5
- How Do I Justify the Medical Necessity of My Care? Part II: The Roland-Morris Questionnaire by Craig Liebenson,DC
- <http://www.chiroweb.com/archives/17/13/05.html>
- http://chiro.org/LINKS/Outcome_Assessment.shtml#QA

MEASUREMENT TOOLS:

Headache Disability Inventory

93

- Self-completed disability scale measuring the impact of headache on a patients ability to function normally in daily life. It contains 25 items and measures change over time. The responses of **yes**, **sometimes** or **no** are scored 4, 2 and 0 respectively. It is simple to administer and interpret.
- FREE
- Time to do (in minutes): not stated
- www.chiro.org

MEASUREMENT TOOLS:

Physical Activity Scale for the Elderly (PASE)

94

- Patient-completed scale based on physical activities during a one-week period by older persons. It covers 3 areas of occupational, household, and leisure activities. The time spent in each activity is multiplied by a weighted value that reflects the amount of energy expended by the elderly person. These weighted values are then summed to give a composite PASE score. The scale can be administered by post, telephone or in person.
- PASE manual (\$25.00), set of PASE instruments (\$35.00 per set)
- Time to do (in minutes): 10
- New England Research Institutes Inc, Attention: PASE instrument, 9 Galen Street, Waterton, MA 02172 USA or contact Hal Thurston for more information E-mail: hthurston@neri.org

MEASUREMENT TOOLS:

Pediatric Evaluation of Disability Inventory (PEDI)

95

- Staff-completed assessment of functional behaviour, comprising 2 dimensions-functional skills scales, carer assistance scales, and covering domains of: self-care, mobility, social function. Carer assistance scales measure amount of help required to accomplish daily tasks. Scored able/unable for 197 functional skill items. This is a revised version of the Tufts Assessment of Motor Performance (Haley SM, Hallenborg SC, Gans BM (1989) Functional assessment in young children with neurological impairments Topics in Early Childhood Special Education 9, 1, 106 - 126
- The pricing structure can be found at <http://www.bu.edu/cre/pedi/orderform.pdf>
- Time to do (in minutes): 30
- Dr SM Haley, Rehabilitation Services, New England Rehabilitation Hospital, 2 Rehabilitation Way, Woburn, MA 01801 USA.

REFERENCES

REFERENCES:

- Research Articles (past research, Epi data)
- Textbooks (diagnosis, exams)
- Websites (CDC, NIH, Epi data)
- Newspaper, magazines, etc.
- Emails, Telephone Interview, etc.

REFERENCES: Research Articles

Top FIVE databases

- MANTIS: Citations and abstracts, 1985-present
- Alternal Health Watch: Journals and newsletters on alternative care
- Cochrance Library: Reviews of Healthcare Interventions
- Index to Chiropractic Literature: Citations and abstracts, 1985-present
- PubMed: Citations and abstracts, ca. 1950-present

REFERENCES: Top 5 Databases

MANTIS: Citations and abstracts, 1985-present

- The Manual Alternative and Natural Therapy Index System includes citations and abstracts of journal articles and proceedings in alternative health care and chiropractic. Use Advanced Search option for the most flexible features. Searches can be restricted to a specific discipline such as chiropractic, acupuncture, herbal medicine, homeopathy, medicine, naturopathy, nursing, osteopathy, or physical therapy.

REFERENCES: Top 5 Databases

100

MANTIS: Citations and abstracts, 1985-present

- Anyone who is not a student or member of the faculty can subscribe to MANTIS.

<http://www.chiroaccess.com/Login.html?Error=2&IPAddress=68.126.185.46>

REFERENCES: Top 5 Databases

101

Altneral Health Watch: Journals and newsletters on alternative care

- Selected journal articles and newsletters from many fields of "alternative" health care. Full-text for most citations. Use Advanced Search option to restrict search to peer-reviewed titles.
- <http://search.ebscohost.com/Login.aspx?lp=login.asp&ref=http%3A%2F%2Fwww%2Eelifewest%2Eedu%2Flibrary%2Fdatabases%2Eshtml&authtype=ip,uid>

REFERENCES: Top 5 Databases

102

Cochrane Library: Reviews of Healthcare Interventions

- World-wide project maintains and disseminates a database of systematic reviews of healthcare interventions. Useful resource for evidence-based health care. Reviews are full-text.
- Demo: <http://www3.interscience.wiley.com/aboutus/demo/>
- Site: <http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/home?CRETRY=1&SRETRY=0>

REFERENCES: Top 5 databases

103

Index to Chiropractic Literature: Citations and abstracts, 1985-present FREE

- The database is produced as a public service by the Chiropractic Library Consortium. It includes citations for peer-reviewed and selected trade journals in chiropractic, from 1985 to the present. Search by author, subject, or title keyword. For recently published journals, ICL also includes abstracts and links to online articles, which are available as open-access or by subscription. Not all chiropractic journals indexed in ICL are refereed so please consult the Peer Reviewed Chiropractic Journals List.
- <http://www.chiroindex.org/>

REFERENCES: Top 5 databases

104

PubMed: Citations and abstracts, ca. 1950-present **FREE**

- PubMed is the National Library of Medicine's index to 11 million citations and abstracts of journal articles in the biomedical literature. By going to the customized link given below, instead of www.pubmed.gov, searchers will be able to see icons indicating which articles are found in both the print.
- <http://www.ncbi.nlm.nih.gov>

REFERENCES: More Databases

BioMed Central Quick Search

FREE online journal content from participating publishers

- Many journals are entirely "Open Access" so that full-text is available without charge. Other journals display only the abstracts for free.
- Only some of the journals are indexed in PubMed, where the citations of full-text articles will display the "free" icon. For those that are not indexed in PubMed, use Quick Search in BioMed Central. In order to restrict a search to one journal, first go to the page dedicated to that publication.
- <http://www.nlm.nih.gov/bsd/disted/pubmedtutorial/>

REFERENCES: More Databases

106

Google Scholar FREE

- Google Scholar is a subset of the full Google search engine, currently with no advertisements. The content includes peer-reviewed abstracts, journal articles, technical reports, dissertations, book chapters, theses, and more from a wide variety of academic publishers, professional societies, preprint repositories and universities. Search results include a useful "Cited by" link.
- <http://scholar.google.com/>

REFERENCES: More Databases

107

- NCBI Bookshelf FREE
- The National Center for Biotechnology Information's growing collection of biomedical books can be searched by keyword. Books are also linked to terms in PubMed abstracts. When viewing an abstract, select the "Books" link to see phrases that are hyperlinked to sections in the full text books.
- <http://www.ncbi.nlm.nih.gov/sites/entrez?db=books&tool=toolbar>

REFERENCES: More Databases

National Library of Medicine Gateway FREE

- The NLM Gateway allows users to search in multiple retrieval systems at the U.S. National Library of Medicine (NLM). The current Gateway searches MEDLINE/PubMed, TOXLINE Special, NLM Catalog, MedlinePlus, ClinicalTrials.gov, DIRLINE, Genetics Home Reference, Meeting Abstracts, HSRProj, OMIM, and HSDB.
- Tip: From within NLM Gateway, authorized users of the Loansome Doc service can automatically route requests for photocopying the full text of articles they have selected. Fees for document delivery apply.
- <http://gateway.nlm.nih.gov/gw/Cmd>

REFERENCES: Textbooks

Bates' Guide to Physical Examination and History Taking, Ninth Edition with E-Book (Guide to Physical Exam & History Taking (Bates)) (Hardcover)

Orthopaedic Examination, Evaluation, & Intervention Pocket Handbook (Paperback)
by Mark Dutton (Author)

Orthopedic Physical Assessment (Hardcover) by David J. Magee (Author)

The Merck Manual 18th Edition (Hardcover) by Mark H. Beers (Author), Robert S. Porter (Editor), Thomas V. Jones (Editor)

Mosby's Diagnostic and Laboratory Test Reference (Paperback)
by Kathleen Deska Pagana (Author), Timothy J. Pagana (Author)

REFERENCES: Websites

National Center for Complementary and Alternative Medicine

- <http://nccam.nih.gov/health/>
- NCCAM's view of chiropractic is found at:
<http://nccam.nih.gov/health/chiropractic/index.htm>

Healthfinder

- <http://www.healthfinder.gov/>
- Maintained by the Department of Health and Human Services, the site includes a virtual health library, links to organizations, information about health care delivery and insurance, news and an "online checkups" feature. In English and Spanish.

REFERENCES: Websites

MedlinePlus

- <http://www.nlm.nih.gov/medlineplus/>
- **Maintained by the National Library of Medicine, the site contains thousands of articles grouped by more than 700 topics on diseases, conditions and wellness.** It also includes interactive tutorials, prepared by the Patient Education Institute, and links to drug information, a medical encyclopedia, dictionary, news, directories, and organizations. In English and Spanish.

California HealthCare Foundation

- <http://www.chcf.org/>
- Analysis of issues and legislation in health care delivery, financing, and insurance. Information on such topics as Medi-Cal, Medicare, nursing homes, and prescription drugs from an independent philanthropy.

REFERENCES: Websites

112

Dietary Supplements Labels Database

- <http://dietarysupplements.nlm.nih.gov/>
- Information from the labels of over 2,000 brands of supplements, including vitamins, minerals, herbs and other botanicals, amino acids, and others.

Drugs@FDA

- <http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm>
- A catalog of FDA approved and tentatively approved prescription, over-the-counter, and discontinued drugs. Includes drug approval letters, labels, and review packages.

REFERENCES: Websites

Toxnet

- <http://toxnet.nlm.nih.gov/index.html>
- Databases on toxicology, hazardous chemicals, environmental health, and toxic releases.

MedlinePlus Drug Information

- <http://www.nlm.nih.gov/medlineplus/druginformation.html>
- Information on thousands of prescription and over-the-counter medications is provided through two drug resources -- MedMasterT, a product of the American Society of Health-System Pharmacists (ASHP), and the USP DI® Advice for the Patient®, a product of the United States Pharmacopeia (USP).

REFERENCES: Websites

114

BrainInfo

- <http://braininfo.rprc.washington.edu/menumain.html>
- A website contributed by the University of Washington that helps one identify structures in the brain and provides many different kinds of information about each structure.

Nervous System Diseases

- <http://www.mic.ki.se/Diseases/C10.html>
- Links from the Karolinska Institute University Library.

REFERENCES: Websites

115 Organizations

- American Cancer Society <http://www.cancer.org>
- American Chiropractic Association <http://www.amerchiro.org/>
- American Heart Association <http://www.americanheart.org/>
- American Public Health Association (APHA) www.apha.org/
- DIRLINE health organization directory <http://dirline.nlm.nih.gov/>
- Health USHHS <http://www.health.gov/>
- International Chiropractors Association <http://www.chiropractic.org/>
- International Spine Association www.spinephysicians.org/isa/
- National Headache Foundation <http://www.headaches.org/>
- National Spinal Cord Injury Association www.spinalcord.org/
- National Wellness Institute <http://www.nationalwellness.org/>
- North American Spine Society www.spine.org/
- Orthopaedic Trauma Association <http://www.ota.org/>

REFERENCES: Websites

Government Health Sites

116

- California Department of Health Services Statistical Resources <http://www.dhs.ca.gov/home/statistics/>
- CDC: Centers for Disease Control <http://www.cdc.gov/>
- Enviro-Health Links <http://sis.nlm.nih.gov/enviro/envirohealthlinks.html>
- Health Finder <http://www.healthfinder.gov/>
- Health Resources and Services Administration <http://www.hrsa.gov>
- Healthy People 2010 <http://www.healthypeople.gov/>
- MedlinePlus Health Topics <http://www.nlm.nih.gov/medlineplus/healthtopics.htm>
- National Center for Health Statistics FASTATS A to Z <http://www.cdc.gov/nchs/fastats/>
- Occupational Safety & Health Administration <http://www.osha.gov>
- ToxSeek <http://toxseek.nlm.nih.gov>
- United States Food & Drug Administration <http://www.fda.gov/>

Example of Chiropractic Case Reports

Example of Chiropractic Case Reports

- Desmarais A, Descarreaux M. Diagnosis and management of "an apparent mechanical" femoral mononeuropathy: a case study. JCCA J Can Chiropr Assoc. 2007 Dec;51(4):210-6.
- Cattley P, Tuchin PJ. CHIROPRACTIC MANAGEMENT OF MIGRAINE WITHOUT AURA: A Case Study. Australas Chiropr Osteopathy. 1999 Nov;8(3):85-90.
- Rutherford SM, Nicolson CF, Crowther ER. Symptomatic improvement in function and disease activity in a patient with ankylosing spondylitis utilizing a course of chiropractic therapy: a prospective case study. JCCA J Can Chiropr Assoc. 2005 Jun;49(2):81-91.

Example of Chiropractic Case Reports

- Quist DM, Duray SM. Resolution of symptoms of chronic constipation in an 8-year-old male after chiropractic treatment. *J Manipulative Physiol Ther.* 2007 Jan;30(1):65-8
- Aspegren D, Akuthota V, Tyburski M, Miller M. Chiropractic treatment of a patient with progressive lumbar disk injury, spondylolisthesis, and spondyloptosis. *J Manipulative Physiol Ther.* 2006 Oct;29(8):686
- Murphy DR, Hurwitz EL, Gregory AA. Manipulation in the presence of cervical spinal cord compression: a case series. *J Manipulative Physiol Ther.* 2006 Mar-Apr;29(3):236-44.

Example of Chiropractic Case Reports

- DeVocht JW, Schaeffer W, Lawrence DJ. Chiropractic treatment of temporomandibular disorders using the activator adjusting instrument and protocol. *Altern Ther Health Med*. 2005 Nov-Dec;11(6):70-3.
- Ferrantelli JR, Harrison DE, Harrison DD, Stewart D. Conservative treatment of a patient with previously unresponsive whiplash-associated disorders using clinical biomechanics of posture rehabilitation methods. *J Manipulative Physiol Ther*. 2005 Mar-Apr;28(3):e1-8. Erratum in: *J Manipulative Physiol Ther*. 2005 Jul-Aug;28(6):460.
- Cox JM, Cox JM 2nd. Chiropractic treatment of lumbar spine synovial cysts: a report of two cases. *J Manipulative Physiol Ther*. 2005 Feb;28(2):143-7

Example of Chiropractic Case Reports

- Wenban AB, Nielsen MK. Chiropractic maintenance care and quality of life of a patient presenting with chronic low back pain. *J Manipulative Physiol Ther.* 2005 Feb;28(2):136-42.
- Owen J, Green BN. Clinical and quality of life changes in a patient with cervical spinal stenosis following chiropractic and homeopathic care. *Altern Ther Health Med.* 2004 May-Jun;10(3):74-6.
- Jamison JR. A psychological profile of fibromyalgia patients: a chiropractic case study. *J Manipulative Physiol Ther.* 1999 Sep;22(7):454-7.

GUIDELINES TO RESEARCH CITATION

Sources:

- Student Guidebook to Resources and Citation (2004, Pearson Custom Publishing)
- The Council of Writing Program Administrators (www.wpacouncil.org)
- www.Plagiarism.com

What is Plagiarism?

124

According to the Merriam-Webster Online Dictionary, to “Plagiarize” means:

1. To steal or pass off (the ideas or words of another) as one's own
2. To use (another's production) without crediting the source
3. To commit literary theft
4. To present as new and original an idea or product derived from an existing source.

So when do you need to document?

When you use information, facts, statistics, opinions, hypotheses, and ideas from outside sources, it is essential that you document them.

Outside sources include (not limited to):

126

- Books
- Web sites
- Periodicals
- Newspapers
- Material from electronic databases
- Radio or television programs
- Interviews
- Speeches
- Letters and correspondence, including email

source: Student Guidebook to Resources and Citation

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