To Ascertain Outcomes of Craniosacral Therapy in Addition to Lymph Massage and Myofascial Release on Chronic Pain and Vertigo in a 46 Year Old Female with Cervical Neck Pain and Migraines

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Abstract

Background and Purpose: Disruption of the craniosacral rhythm (CSR) is thought to be the cause of some types of chronic pain. Craniosacral therapy (CST) is a manual therapy technique that restores the pulse of the craniosacral system through a gentle pressure applied to the head and spine. Currently, physical therapists have been exploring the use of craniosacral therapy as an alternative form of treatment even though there are no studies supporting the use of this technique. The purpose of this case report was to document outcomes following craniosacral therapy in addition to lymph massage and myofascial release on chronic neck pain, migraine type headaches and vertigo. Case Description: The participant was a 49 year old female with reports of chronic neck pain, migraines, and vertigo that impacted her quality of life. She had difficulty with traditional therapy because most positions increased her symptoms of vertigo. She needed an alternate approach for successful therapy and personal goal attainment. Methods: The participant was seen 2 times a week for 60 minutes a total of 6 sessions. Each session included craniosacral therapy, lymph massage, and myofascial release with a focus on the release of tissue restriction and realignment of the craniosacral rhythm through palpation of the inner ear, occipital, and temporal bones. Outcomes: After six 60 minutes therapy sessions, her initial cervical pain and headaches disappeared and no longer interfered with sleep or quality of life. The participant's vertigo did not improve over the course of treatment, and she could not return to work. Discussion: Craniosacral therapy, myofascial release, and lymph drainage may decrease muscle tension and improve craniosacral rhythm thereby improving pain and headaches without increasing vertigo. The cause of her vertigo is unknown and the vertigo was most likely independent of the cervical pain and headaches.

Background and Purpose

Neck pain is a common complaint in the United States and can lead to inability to perform normal activities and a decreased quality of life.[1,2] The reason people develop pain in the cervical area is unclear. Some studies suggest the causes may come from dysfunctional posture, joint disease or a neurological process.[2,3] Cervical pain can develop into a chronic condition manifested as attacks that are unrelenting, reoccurring or inconsistent, and disabling with a 22% risk of recurrent episodes.[2,4,5] Chronic neck pain is defined as pain lasting longer than the expected time frame of healing. Loss of range of motion (ROM), weakness, dizziness, and feeling of stiffness is also evident.[1,2,6] While 54% of people do develop neck pain, pain only completely resolves in 33% of them. It is found that older people with neck pain typically experience it chronically while younger people typically have complete subsiding of pain. Approximately 58% of women and 47% of men develop cervical pain; however women have less chance of restoring life without symptoms.[2,4,5] Neck pain does not only cause pain in the cervical spine region; it can extend into the cranium and cause what is known as cervicogenic headache which is a headache of cervical origin.[6]

Migraines are a form of headache that is chronic. Migraines are described as episodes of severe headaches of a neurovascular component lasting several hours to three or five days.[7,8] Migraines which are characterized by localized head pain may be present an average of 1.5 times per month accompanied by associated symptoms of nausea, vomiting and sensitivity to surrounding noise and light.[8,9] In recent years, there has been an increase in the prevalence of migraines in women of reproductive age by 60%. This increase may have a correlation with other trends in the United States including an increase of working mothers, mothers who are divorced, and women with nutritional issues due to poor eating habits

(processed foods and portion control).[10] Common triggers inducing an episode are thought be related to the environment and include odor, poor air quality, and changes in barometer pressure and air temperature.[9]

Complaints of vertigo are often independent or present with headaches related to upper neck problems. The episodes of vertigo can last for a few seconds to days with variable frequency.[7,11,12] People with headaches often show symptoms of vertigo without a known cause. It is estimated that vertigo occurs in 25% to 54% of people afflicted with migraines. The incidence of vertigo increases with age (38% of those are aged 60 years or older) and is not gender specific. Vertigo is commonly known as dizziness. The person feels as if they are rocking or falling while their surroundings are spinning. This creates an unstable environment during sitting and ambulation.[7,11,13] Vertigo along with neck pain can impair a person's balance and proprioception system. The episodes make it difficult for them to see their surrounding environment causing loss of balance; this can cause debilitating symptoms of anxiety, stress and increased fear.[12,14]

Neck pain, migraines, and vertigo are commonly treated by physical therapists in the clinic. A typical protocol for treatment may include electrical stimulation, spinal mobilization, manual therapy, stretching and exercise. The focus of spinal manipulation is meant to realign the spine. Electrical stimulation can achieve pain reduction and minimize muscle spasm. Manual therapy will release restrictions found in soft tissue. Once the pain has been relieved, preventative treatment will be used through stretching and exercise. The interventions may be used in combination or independently of each other with the intent of regaining the previous level of functioning and obtaining the person's personal goals.[15]

Currently, physical therapists have been exploring the use of craniosacral therapy

(CST) as an alternative form of treatment even though there are no studies supporting the use of this technique. CST may compliment pharmaceutical and traditional treatment or serve as the single alternative method. Craniosacral rhythm (CSR) is palpated by a physical therapist. The person is positioned in a supine position on the table. The physical therapist uses a light touch starting at the head and then proceeds through the four compartments of the body (cranial base, pectoral girdle, diaphragm and pelvic girdle) by light palpation with the use of finger tips. Through the palpation of the four compartments the therapist identifies any restriction in fascia and soft tissue or abnormal rhythm within the craniosacral system which is then corrected by stopping the cerebral spinal fluid flow. This allows the system to normalize with a consistent rhythm.[16]

There are many theories as to the existence of a CSR and what causes the rhythm to occur. The cranial bones articulate in a way that they do not overlap; instead they form a line held together by tightly perforated living bone. The sutures are so close that they are unable to move in a way that could damage surrounding tissue but remain flexible enough for slight movement of cerebral spinal fluid (CSF) and the meningeal membrane.[16-18] According to Upledger and Vredevoogd,[19] the CSF causes increased pressure within the cranium. The production of CSF increases the amount of fluid within this space which causes a rise in pressure. When production of fluid shuts down, CSF is reabsorbed resulting in a decrease in pressure. This is the CSR which can be felt manually by palpation. There are two phases to CSR: flexion and extension. Flexion can be described as the contraction phase, in which the head expands laterally as the anterior and posterior areas become shorter. At the sacrum the apex moves in an anterior direction and the extremities externally rotate. During the extension phase, the head narrows laterally in an outwardly direction while the anterior and

posterior area lengthens. The sacrum's apex moves posterior and extremities move internally. This rhythm is steady and consistent at approximate 6 to 8 cycles per minute.[18, 20- 22]

Disruption of the cycle is thought to be the cause of chronic pain. After exposure to emotional stress, trauma, illness, postural strain or surgery the body will attempt to stabilize dysfunction with compensations and temporarily mask any symptoms. Because of the inability to correct the CSR, symptoms will appear later as localized lower back or neck pain, headaches/migraines, asthma and vertigo.[16]

Researche's have dedicated their time and investigations to the existence of the CSR and the reliability of interrater and intrarrater examination of the rhythm. Upledger[23] explored the reliability and quality of CSR by rating the degree of restriction using a three-point scale. Four evaluators examined 25 children based on 19 parameters of motion. There was 86% total agreement between evaluators for each parameter there was a specific level of restriction. Their study provided evidence for the theory of an existing CSR, which also provided adequate evidence of interexaminer reliability.

Hanten el al[21] evaluated the inter examiner and intra examiner reliability for palpation of CSR cycle rate. The study also determined the relationship between heart rate, respiratory rate and CSR of the evaluators and participants. Two evaluators with 9 months of CST expertise were instructed to palpate CSR in 40 healthy adults. During two different sessions each evaluator palpated the CSR rate at the cranium while heart rate and respiratory rate of evaluators and participants was documented. While this study showed high reliability for intraexaminer (reliability = .78 & .83), there is low reliability for interexaminer (reliability = .22) of the CSR. This indicates that while two different examiners may not be consistent in palpating CSR, a single examiner over multiple sessions will produce consistent palpating

results.

Currently, CST is taught and used as a clinical tool by many clinicians, anecdotally showing positive results among patients. Unfortunately, there is limited evidence in the literature to support what clinicians are experiencing in their therapeutic sessions with patients. Liccardone et al[24] evaluated the effect of CST and other osteopathic manipulative therapy (OMT) treatment such as myofascial release, strain-counter strain, muscle energy, soft tissue, and high-velocity-low amplitude thrusts. Ninety-one patients with low back pain were randomized into one of three groups (OMT, Sham manipulation and a control group). Those in the experimental group received seven 15-30 minute treatment sessions over a 5 month period of time and were reevaluated at 1 month, 3 month, and 6 months. Outcomes were measured through the SF-36 scale, Roland-Morris Disability Questionnaire and VAS scale for nonspecific low back pain. This study did show that participants received some therapeutic benefits from the OMT treatments for nonspecific low back pain ($p = 0.03$) and needed fewer treatments ($p = 0.03$) compared to participants in the control group.

Mann et al[25] completed a study to determine the possibility of developing a randomized control trial (RCT) for the use of CST as treatment for migraines. One hundred and nine participants over the age of 12 years that met the International Classification of Headache Disorders criteria and experienced 5 to 15 episodes of migraines, per month for at least two years, were eligible to participate. Over a course of 20 weeks, participants were required to generate a migraine journal and attend CST and magnet therapy treatment sessions. Because there were so many participants with migraines willing to commit to this study, the authors were able to determine the appropriate sample size and identify realistic outcome measures to assess efficacy. This establishes a strong support for future

development of a dynamic randomized control trial for CST as treatment for migraines.

While there are supporters and skeptics of CST, there are clinicians in the field using CST as therapy anecdotally positive outcomes. However, there is no evidence based research to support the outcomes the clinicians and patients experience. The purpose of this case report was to document the outcomes following craniosacral therapy in addition to lymph massage, and myofascial release on chronic neck pain, migraine type headaches and vertigo.

Case Description

A 49 year old female was referred to physical therapy by a nurse practitioner for treatment of neck pain, migraines and dizziness. Her chief complaints were of pain in the neck and upper back accompanied by headaches and vertigo. Onset of neck pain began in May 2009 while symptoms of migraines and vertigo developed in 2005. Symptoms were of insidious onset. During the initial evaluation, on a scale from 1 to 10, she rated her pain as a 6/10 and reported that it ranged from 3/10 at best to an 8/10 at its worst. Her pain was located in the right upper back and cervical regions and extended caudally into her right posterior lateral cranium. See figure for measurements. She described her symptoms as intermittent headache like pain accompanied by dizziness. Her symptoms were aggravated when nodding her head, turning her body, walking in the dark, rolling in bed, following written recipes, eating, shaving, during hair care, bathing/showering, washing dishes, or when positioned in prone, sidelying, and supine. Sitting in an upright position was the only comfortable position. She had difficulty sleeping due to headaches, dizziness and pain. Motrin reduced the severity of pain and headaches but was not effective enough to regain previous level of function. She was monitored on a regular basis by her neurologist every 6 months.

Her significant medical history included hypertension, right shoulder surgery in 4/08,

cholecystectomy in 2004 and tubal ligation in 1983. Current medications consisted of Avapro for hypertension and Topamax used to prevent migraine headaches. She has received chiropractic treatment in the past which did not provide a change in symptoms. She was married and missed going on walks with her husband. She has been unemployed since the onset of vertigo in 2005 and no longer worked as a cashier. Her personal goal was to sleep without discomfort. The patient was categorized into Preferred Physical Therapy Practice Pattern 4D: Impaired Joint Mobility, Motor Function, Muscle Performance, and Range of Motion Associated With Connective Tissue Dysfunction and Practice Pattern 5A: Primary Prevention/Risk Reduction for Loss of Balance and Falling. Human subject's approval was obtained through The Sage College's Institutional Review Board.

Examination

An upper quarter screen was performed to rule out musculoskeletal dysfunction or neurological deficits.[26] ROM measurements were taken with a goniometer. Cervical ROM was limited by pain and dizziness. See Table 1 for specific measurements. Gross assessment of the shoulder was performed in sitting using the "hands behind the back and head" method; she demonstrated pain-free movements that were within normal limits. Manual muscle testing (MMT) testing was performed bilaterally of the shoulder abductors; shoulder flexors; upper, mid, and lower trapezium muscles; serratus anterior; and rhomboids on a 5 point scale. All muscles were 4/5 throughout with the exception of the upper trapezium which was 5/5. Standing posture was observed in the posterior and sagittal planes. Posterior observation revealed increased elevation of the right shoulder and scapula, while the spinal column and iliac crests were symmetrical. Sagittal plane assessment revealed an accentuated cervical lordosis and thoracic kyphosis which can be categorized as a "sway back". Palpation of the

right neck muscles and right medical scapula reproduced pain. There were no signs of neurological deficits as assessed through myotome testing of C3 – T1, deep tendon reflex testing of C5- C8, and light touch sensory testing for the C4– T1 dermatomes using a light touch of the therapist's finger.

Special tests were performed to rule in or rule out any specific cervical dysfunction. The upper limb tension test, cervical distraction test, and compression test were performed in a sitting position because of the participant's intolerance to the supine position. The results were negative for cervical radiculopathy.[27] Hallpike-Dix Testing was performed to rule out BPPV and was negative. The Provoked Vertigo Test total score of 25, Ocular Motor Assessment and Sensory Performance Test indicate a possible vestibular default in the right vestibular system. See Tables 2- 4 for specific measurements. The flexion-rotation test revealed a positive sign for cervicogenic headache, as pain was produced and a loss of cervical flexion was observed.[28, 29] A craniosacral evaluation was performed a week after the initial physical evaluation. There was tissue restriction and abnormal cranial rhythm in the base of the occipital and temporal area of the cranium.

Outcome Measures

Two forms of measurements were used to address participant's outcomes. The first is the visual analog scale (VAS) which is used by many clinics to evaluate pain. The participant rate her pain based on a scale ranging from 0 to 10 with 0 being no pain at all to 10 which is the worst pain. A study assessed the test retest reliability of the VAS scale and the body reference diagram showing intraclass correlation coefficients (ICC) of .66 to .93 for reliability of the VAS.[30] The VAS is considered clinically significant with a negative change of two increments.[31,32]

The second outcomes measure is a functional assessment which is based on the history taken from the participant during the interviewing process. The self report measure assessed the participant's satisfaction with sleeping without discomfort and to perform basic activities of daily living (ADL) such as washing dishes, doing hair care and showering/bathing. Reliability of an informal self-report functional assessment was not found; however an outcome assessment of the neck disability index (NDI) was similar. The assessment is a questionnaire that measures the levels of neck pain, personal care, lifting, reading, headaches, concentration, work ability, driving, sleeping, and activities/hobbies. The study assessed test-retest reliability of the NDI showing an ICC of 0.89 and a concurrent validity of 60.[33]

Evaluation/ Prognosis

The participant's primary complaint was an intermittent achy pain in the cervical and headaches at the back of the head with accompanied dizziness which presented with no change in severity. Based on the vestibular examination and physical examination, the test and measures indicated she had musculoskeletal impairments of pain, and decreased range of motion, which resulted in functional limitations. She most likely had a separate vestibular dysfunction and possible vestibular default in the right vestibular system. It was possible that the vertigo was linked to musculoskeletal issues and the resolution of musculoskeletal impairments would resolve the episodes of vertigo. The physical examination did not give any indication of neurological deficit or radiculopathy arising from the cervical area.

During the physical examination and first intervention the participant experienced increasing vertigo symptoms as she was changing multiple positions. Upon palpation, the cervical and upper back muscles were tight. The tight muscles may have created a pulling

effect of the spine which brought the axis up against the base of the occiput causing pain and headaches. The goal of the first intervention was to relieve pain and release cervical muscle tightness. The chosen modality was GUS; however the patient reported increased sensitivity to the electrical impulses. GUS was replaced with US for 8 minutes with little improvement. We were concerned that she would not have been successful in traditional orthopedic physical therapy. She needed an alternate approach to obtain her personal goals and regain her previous functional level. Directing her interventions toward craniosacral, myofascial release and lymph drainage may release the muscle tension and reduce pain in a position that will not increase vertigo symptoms.

The participant was committed to therapy and motivated to meet her goals. It was predicted that with the intervention primarily of craniosacral therapy and other manual therapy, the participant would regain previous functional level and meet her personal goal within 6 sessions.

Based on data obtained through the evaluation and prognosis the physical therapy goals were outlined as follows: The participant will obtain short-term goals within 2 weeks. These goals included: 1) pain will decrease to a 3/10 with cervical movement; 2) the participant will increase cervical active ROM by 50% to enable ADLs. Long-term goals will be met within 4 weeks. 1) the participant will sleep through the night pain free and 2) the participant will increase cervical active range of motion to 100% functional to enable ADLs and 3) the participant will increase muscle strength to 5/5 of the upper body to sustain prolonged and properly aligned posture. It was expected that she would need to be seen 2 times a week for 60 minutes a total of 6 sessions. Each session included craniosacral therapy, lymph massage, and myofascial release. Discharge was determined by collaboration between

the physical therapist and the participant based on the satisfaction of meeting goals and an increase in function with no occurring symptoms.

Plan of Care

Interventions were performed by the practicing experience of the institution's craniosacral specialist who has been trained under the Upledger Institute and practicing craniosacral therapy technique for the past several years. The intervention focused on manual physical therapy with an emphasis on craniosacral therapy. In addition, the participant's plan of care included occupational therapy sessions provided by a vestibular specialist with attention focused primarily on the vertigo. At the first physical therapy session she was seen by the craniosacral specialist. The therapist educated the participant about the function of the neck muscles and possible causes of dysfunction leading to her symptoms. The participant received therapy in a quiet room without any distraction to help her feel at ease and to prepare her for the manual therapy. In supine position the participant was inclined at 45 degrees to assess the craniosacral rhythm and restrictions to determine which areas of the craniosacral system were unbalanced and which tissues were restricted. Craniosacral therapy is not usually performed at an incline but because of vertigo issues the participant was intolerable to a complete supine position. More than half of the 60 minutes was dedicated to the release of tissue restriction and realignment of the craniosacral rhythm of through palpation of the inner ear, occipital, and temporal bones.

The remainder of the session was dedicated to myofascial release and lymph massage bilaterally of the neck. Strain-counter strain technique targeted the upper trap, scalene, proximal SCM, and sub occipital muscles. The lymph massage focused drainage at the clavicle for clearance with drainage of the cervical. There was no progression in therapy;

the next 4 sessions provided the same form of interventions and in the same setting. The vestibular specialist assigned the patient with a home exercise program which included head circles 5 times each direction, 2 times a day, ball with saccade 10 times 3 times a day and ball with target 10 times 3 times a day. After one month with no change in vertigo, the specialist referred her back to her physician.

Outcomes

After five sessions of craniosacral therapy, myofascial release and lymph massage the participant reported improvements in the right upper back and cervical regions. Symptoms of headaches into the occipital and right posterior lateral cranium had also diminished. Initially she reported her pain at a 6/10 on the VAS. By the sixth session the participant reported a 0/10 for all symptoms relating to neck pain and headaches. At the time of discharge, at the sixth session, the participant's vertigo had remained unchanged and was referred back to her physician for further evaluation.

Although the participant was unable to return to work due to episodes of vertigo, she did have satisfaction by meeting her personal goals. Prior to physical therapy she had difficulty sleeping at night due to the symptoms of pain in her cervical and cranium. Following the six session of treatment the participant was successful at meeting her goals with ability to sleep uninterrupted by reoccurring symptoms. ROM, MMT, and ADL's were not assessed at discharge.

Discussion

The participant was a 49 year old female with reports of neck pain, migraines, and vertigo that impacted her quality of life. She had difficulty with traditional therapy because positions including supine, prone, sidelying and ambulating increased her symptoms of

vertigo. She needed an alternate approach for successful therapy and personal goal attainment. Using methods such as craniosacral therapy, myofascial release, and lymph drainage may have decreased muscle tension while reducing symptoms of migraines and dizziness. After six 60 minutes therapy sessions the participant reported meeting her personal goal of sleeping through the night without interruption. Her initial pain and headaches disappeared and no longer interfered with her night sleeping or quality of life as reported by the participant.

During the initial evaluation, the examination of the cervical area by palpation revealed significant muscle tightness throughout this region. The history provided insight as to the participant's reports of vertigo limiting quality of life. The vertigo was causing her increased stress in her daily life as many activities would trigger her to become dizzy. As the condition continued and became chronic the dizziness and stress eventually caused her muscle tightness in her neck which led to the migraines.[1,6,14] CST and other manual therapies allowed the patient to relax her neck muscles without increasing her vertigo symptoms which is hypothesized to be the root of her problems. As physical therapy continued the participant's vertigo did not improve regardless of the manual therapies conducted by the CST therapist and vertigo treatment given by the occupational therapist. It is unclear of the cause of the participant's original cause of her dizziness and does not present with one vestibular diagnosis of vertigo. This is common since 26% of 2196 cases of vertigo have an unknown cause.[13]

The participant reported her neck pain and headaches disappeared and her vertigo remained. These outcomes were enough for her since sleeping at night was no longer an issue. However, the vertigo that did remain was enough to create disability and prevent her

from returning to work. Her previous employment, a cashier, involved head positions of a static and dynamic nature which would cause episodes of vertigo to occur. If she were to return to work, she would be aggravate her symptoms regularly throughout the day which could lead to increased stress giving her muscle tightness, neck pain and headaches.

There were outcome measures not used during the initial evaluation that could have added more information to the overall outcome in this case. Clearly defining functional outcomes relating the participant's cervical dysfunction could have been accomplished through the Neck Disabilities Index (NDI).[33] The NDI is a functional outcome measurement tool that would have been appropriate to this participant as it measures neck pain and includes categories focusing on level of pain and frequency of headaches.

Another limitation was the lack of quantitatively outcome measures throughout the participant's course of treatment. At initial evaluation, active and passive ROM, MMT and ADLs were addressed but were not reassessed at discharge. The initial therapist measured ROM and muscle strength however; the second therapist who discharged the participant did not observe the outcome measures. Limiting the number of treating therapists would have been effective in obtaining accurate information and reducing examiner error. The qualitative and quantitatively information, including pain, MMT, ROM, and a functional assessment (SF-36 questionnaire) obtained through a baseline measurement and through to discharge does indicate changes that were made based on the chosen intervention. As clinicians, this information supports the clinical decision or justifies the need to change treatment modality.[33] An additional effective strategy for identifying outcomes would be to isolate the key modality involved rather than combining into a mixture of other modalities. When there are several modalities involved it becomes difficult to clearly identify which one is

responsible for a negative, positive, and or indifferent outcome.

Future research is necessary to identify the role of CST in the field of physical therapy as evidence based intervention and determine whether it is effective in the management of dysfunction. The outcomes revealed by this case report is a similar occurrence experienced by many clinicians who use CST within their practice. This is evident by the many testimonials from patients and clinicians throughout the US.[34] There also is a high degree of controversy and skeptics surrounding the existence of the CSR, however does this mean that it does not exist or that technologically this field has not develop an effective tool to accurately measure the existence of CSR? [22] All of these elements discussed above validates the importance and need of future research for making this intervention evidence based practice for physical therapy.

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Table 1. Cervical Active Range of Motion

Position	Right	Left
Flexion	35	
Extension	16	
Side Bend	26	42
Roataion	49	52
All measurement in degrees		

Table 2. Provoked Vertigo Test

Position	Intensity	Duration[a]	Score
Supine to Sit	4	3	7
Head Rotation	6	3	8
Head Fl/Ex [b,c]	5	3	8
Total	14	9	25

[a]Seconds
[b]Flexion
[c]Extension

Table 3. Ocular Motor Assessment: VOR

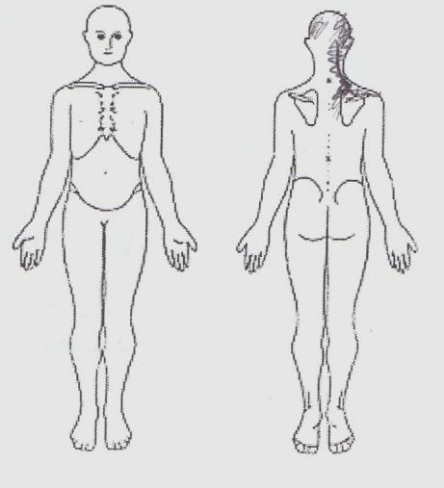
Position	Performance	Symptom
Head Shaking Nystagmus	Possible left beat	D=5[a]
Head Thrust	Corrective saccade right	D=5[a]

[a]Dizziness

Table 4. Sensory Performance Test

Position	Outcome
Eyes Closed with foam surface	Fall within 4 seconds
Fucada Test	Positive on the right

Figure: Body Reference



Participant's description of location of pain on a body diagram.