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**American Chiropractic
Neurology Board**

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JOB ANALYSIS

Technical report of the three year job analysis of the chiropractic or functional neurologist derived from an international cadre of professionals.

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Analysis Survey 2010-2013

The Job Analysis undertaken by the American Chiropractic Neurology Board, Inc. was initiated in 2010, starting with the development of the Job Analysis subject matter expert survey (SME) design group. (Please see Appendix A for the description of this panel.)

The group designed the surveys from January through June of 2010. The pilot occurred from July through December of 2010 and was edited and revised based on feedback from the pilot exam. The final surveys were loaded into Survey Monkey in 24 segments covering various areas specific to skills and knowledge related to practicing as Chiropractic Neurologists.

The job analysis from 2002 served as the platform for the general topic categories. As an incentive for completion of the entire set of surveys, the ACNB approved 10 Continuing Education credits to each certificant completing the entire set of surveys. Many of the doctors stated that the review of their practice and of the knowledge required was an excellent look into the entire field as well as their own practice.

Demographics

The total number of surveys received was 256; however, 29 were completed by students and that data was deleted as not relevant to the job analysis leaving 227 completed surveys to consider. The number of current, qualified certificants ranged from 402 to 475 over the years of the survey collection (2011 through 2013).

Demographics by Gender	Percent of Total Respondents
Male	79.2
Females	20.8

Demographics by Board Association	Percent of Total Respondents
Diplomates of DACNB	78.8
Diplomates of DABNC	15.7
Diplomates of DACAN	3.7
Other Specialty Certification	1.8

The number of years of experience as a Diplomate ranged from at least 23 years (category of before 1990) to less than 1 year for those completing the survey during the year they certified.

Demographics by Country	Percent of Total Respondents
United States of America	77.7
Australia	6.6
The Netherlands	3.5

Demographics by Country (cont'd)	Percent of Total Respondents
United Kingdom	3.5
Canada	2.8
Norway	1.8
Denmark	0.8
Germany	0.8
France	0.4
Italy	0.4
Jamaica	0.4
Mexico	0.4
Puerto Rico	0.4
Republic of Korea	0.4
Sweden	0.4

Diplomates completing surveys resided in 43 of the 50 states in the United States. This geographic presence is representative of the total registry of the ACNB.

Overall Survey Design

The Job Analysis Survey consisted of twenty-two categorical sections; the first covering the technical skills of collecting history and performing examination and the second covering the cognitive areas needed for diagnosis and treatment. Inclusive in the diagnosis are tests necessary for diagnostic confirmation. Inclusive in treatment are various modalities, considerations and rehabilitation. Patient management or co-management with another discipline was included in the cognitive areas. One categorical section of the survey consisted of “red flag” considerations or those clinical issues where a patient is in immediate danger of death. The following is a list of the twenty-two sections of the survey.

The Categorical Surveys 1-6 combine to delineate the Blueprint for the Performance Examination.

Survey 1: Prescreening History

Survey 2: History, Physical Examination Components of Vital Signs and Cranial Nerves

Survey 3: Physical Examination Component Sensory System

Survey 4: Physical Examination Component Motor System

Survey 5: Physical Examination Component Reflexes

Survey 6: Physical Examination Components Cerebellum, Balance, Vestibular System

The Categorical Surveys 7-24 determine cognitive knowledge necessary for the safe practice of chiropractic neurology and in combination determine the blueprint for the Written Examination.

Survey 7: “Red Flag” Issues

Survey 8: Neuron Theory (microscopic neurological principles necessary for safe practice)

Survey 9: Receptors
 Survey 10: Peripheral Nerve
 Survey 11: Spinal Cord
 Survey 12: Brainstem
 Survey 13: Cranial Nerves
 Survey 14: Head and Face Pain
 Survey 15: Cerebellum
 Survey 16: Basil Ganglia
 Survey 17: Reflexogenic Systems
 Survey 18: Autonomic Nervous System
 Survey 19: Limbic System
 Survey 20: Lobes of the Brain
 Survey 21: Brain and Its Environment
 Survey 22: Neuroendocrine and Neurometabolic
 Survey 23: Pain
 Survey 24: Special Studies

Definitions Common to all Categorical Surveys

Each categorical survey addresses the topics from three perspectives: frequency of use of the information, importance of the information to safe practice and management of patients with related conditions. The surveys used Lykert Scale measurements and definitions as follows:

Frequency: refers to the time that the credentialed professional spends performing duties that require proficiency in each of the domains and tasks. For domains, frequency is calculated from the various tasks. For tasks, the frequency scale is as follows with the responder noting the different meanings for the types of tasks indicated:

- 0 = Never (on no patients)
- 1 = Rarely (once per year) (On very few patients)
- 2 = Sometimes (once per month) (On select patients when indicated)
- 3 = Often (once per week) (On all new patients)
- 4 = Repeatedly (every day) (On all patients, new and returning)
- 5 = Specialty Practice (Not applicable as the specialty does not include this area)

The calculation to determine the relative weight of the frequency for each survey item is as follows:

$$\text{Weight} = ((0*n_0)+(1*n_1)+(2*n_2)+(3*n_3)+(4*n_4))/(N-n_5)$$

Where N is the total number of respondents, n_0 , n_1 , n_2 , n_3 , n_4 , and n_5 represent the number of respondents choosing the respective Lykert scale values.

Importance: refers to the value of the knowledge or skill that the credentialed professional determines for each item in each of the domains and tasks. For domains, importance is calculated from the various tasks. The question asked for importance is, “How essential is the domain to the competent performance of the credentialing

professional?” For tasks, the importance scale is as follows (with the responder noting the different meanings for the types of tasks indicated):

- 0 = Of No Importance
- 1 = Of Little Importance
- 2 = Moderately Important
- 3 = Very Important
- 4 = Extremely Important

The calculation to determine the relative weight of importance for each survey item is as follows:

$$\text{Weight} = ((0*n_0)+(1*n_1)+(2*n_2)+(3*n_3)+(4*n_4))/(N)$$

Where N is the total number of respondents, n_0 , n_1 , n_2 , n_3 , and n_4 represent the number of respondents choosing the respective Lykert scale values.

An additional data point is acquired in the first seven categorical surveys. That information is the identification of who performs the task. Those choices are as follows:

- Chiropractic Neurologist
- Chiropractor
- Other Doctor
- Nurse
- Treatment Assistant
- Insurance Clerk
- Receptionist
- No One (if No One is chosen, then Importance and Frequency are both rated “0”)

The calculations for this identification are in percentages.

For surveys 7 through 24 the additional category of Management is applied. The definition provided to the respondents is, “Management refers to how you will treat the patient in the diagnostic areas related to this subject field.” The Lykert type identifiers for management of patients with specific conditions are as follows:

- 0 = Refer to Allopath without follow-up by Chiropractic Neurologist
- 1 = Refer to Allopath with Chiropractic Neurologist Rehabilitation
- 2 = Co-manage with Allopath with Allopath primary and Chiropractic Neurologist secondary
- 3 = Co-manage with Allopath with Chiropractic Neurologist primary and Allopath secondary
- 4 = Independent management by Chiropractic Neurologist

The weight for the management of the patient is calculated as indicated below:

$$\text{Weight}_m = ((0*n_0)+(1*n_1)+(2*n_2)+(3*n_3)+(4*n_4))/(N)$$

Where N is the total number of respondents, n_0 , n_1 , n_2 , n_3 , and n_4 represent the number of respondents choosing the respective Lykert scale values.

Decision Rules

The SME team determined that items would be included in the blueprint under the conditions listed below.

In the items where the “Who Performs” identification is determined, at least 70% of the time it must be a Chiropractic Neurologist.

For frequency, importance and management the calculated weight must be 2.5 or higher for all except survey 7. That survey indicates conditions where referral to an Emergency Department is mandated so the calculation is below 2.5 for inclusion.

Once the individual items (cognitive or task) are classified as belonging in the blueprint, the overall weight of each Domain is calculated by determining the sum of the weight of each item in that domain divided by the number of items in that domain.

The actual number of items in each survey meeting the decision rule is then totaled and a percentage is calculated based on the total number of items in the set of surveys (1-6 or 7-24). This percentage is applied to the total number of items for the practical exam (Surveys 1-6) and total number of items for the written exam (Surveys 7-24).

The two sets of calculations, as indicated by the weight of the items and the number of items meeting criteria, are compared. The final blueprint is calculated from these two sets of summary data. See Appendix B for Categorical Survey Items and Weights, Appendix C for the Calculation Tables.

Examination Blueprints

Performance Exam Blueprint

New patient information is collected at almost all chiropractic neurologists' offices but the doctors do not perform this task. The practical exam will address those tasks that the chiropractic neurologist must perform for safe practice of the job.

Performance Exam Blueprint	Percent of the Exam
Review& Clarification of pre-screen history	12.54%
Vital Signs	10.82%
Cranial Nerves	8.96%
Physical Exam: Sensory	9.82%
Physical Exam: Motor	10.25%
Physical Exam: Muscle Stretch Reflexes	9.39%

Performance Exam Blueprint (cont'd)	Percent of the Exam
Physical Exam: Cerebellum/Vestibular	9.75%
Basal Ganglia	10.68%
Limbic	9.71%
Cognitive	8.06%

Written Exam Blueprint

The written exam blueprint addresses both the Cognitive Domains necessary for the Chiropractic Neurologist to practice and the task sets necessary to the job. These task sets we have identified as Work Activities for the purpose of the Blueprint. The Cognitive Domains and the Work Activities are directly related to each other. An additional two percent of the exam is devoted to ethical issues. (The survey did not address the Ethics issue as those items are taken from the actual issues that arise each year.)

Domain	Percent of Written Exam
Neuron Theory	5.50%
Receptor Systems	4.84%
Peripheral Nerves	5.30%
Spinal Cord	5.40%
Brainstem	5.76%
Cranial Nerves	5.87%
Head and Face Pain	6.61%
Cerebellum	6.43%
Basal Ganglia	6.56%
Reflexogenic Systems	6.56%
Autonomic Nervous System	6.64%
Limbic System	5.25%
Lobes of the Brain	6.42%
Brain and Its Environment	5.73%
Neuro-Endocrine System	4.12%
Pain	6.51%
Red Flag Issues	4.51%

Work Activities	Percent of Written Exam
History	3.73%
Physical Exam	7.66%
Special Studies	9.22%
Diagnosing/Diagnoses/Disease Processes/Metabolic Rate/Pathways	42.60%
Treatment and Rehabilitation (includes anatomy & physiology pertinent to Treatment & Rehabilitation)	34.99%
Referral	1.80%

Special Topic	Percent of Written Exam
Ethics	2.00%

Appendix A

Job Analysis Subject Matter Experts

Robert Humphreys, DC, DACNB-board of directors' representative and faculty at Chiropractic University

Heidi Grant, DC, DACNB-representative from the UK

Randy Beck, DC, DACNB-representative from Australia and faculty in Australia programs

Charles Nelson, DC, DABCN-representative from France and English as a Second Language (herein designated by ESL) representative

Merry Hanson, DC, DACNB-representative from the northwestern United States

Youn Min Woo, DC, DACNB-representative from Asian areas and ESL

Heith Root, DC, DACNB-representative from southern United States

Kurt Kuhn, DC, DACNB-representative from northern United States

Candace Duty, DC, DACAN-representative of DACAN

Karen Feeney, DC, DACNB-representative of eastern United States

Facilitated by Lucinda Harman, Ph.D.-Executive Director

Assisted by Kari Hodge, B.Ed., M.Ed.- doctoral student at Baylor University in Educational Psychology majoring in measurement under the direction of Grant Morgan, Ph.D.-faculty at Baylor University in Department of Educational Psychology

Appendix B

Items on Categorical Surveys and their Decision Weights

Survey 1: Demographics and Pre-screening History

Name (for CE credit)

Age Range: five-year increments from 20 through 71+

(Range: 20-25 through 71+ with the Mode and Mean at 40-45)

Gender: Female 20.78% Male 79.22%

Year Receiving Certification as a Chiropractic Neurologist (used to determine years of practice): Range before 1990-2012

Type of Certification: DABCN (15.67%), DACAN (3.69%), DACNB (78.80%), or Specialty (1.8%)

Years as a Chiropractor <1 to 46 years

Years as a Chiropractic Neurologist <1 to 24 years

Location of Practice (See Demographic Write-up in Body of Analysis)

Login ID-individual

Pre-screening section

1. Do you prescreen your patients? (*Answers*) Yes 71.11% No 28.89%
2. If more than one person participates in this, who are they and how frequently and how important is this in your practice? (*Answers*) Chiropractic Neurologist-33.33%, New Patients Only and Moderately and Extremely Important = 72.27%
3. If you prescreen, what is the method (select all that apply)? (*Answers*) telephone (82.14%), Internet (32.14%), email (31.43%), walk-in (51.43%)
4. Does your office have more than one chiropractic neurologist? How many? (*Answers*) 1 = 86.51%, 2 = 12.56%, 3 = .93%, 4 = 0%, 5 = 0%
5. Does your office have non-neurological chiropractors? How many? (*Answers*) 0 = 61.40%, 1 = 24.65%, 2 = 6.51%, 3 = 5.58%, 4 or more = 1.58%
6. Is the prescreen information used to assign the physician to the patient? (*Answers*) Yes = 28.44% No = 71.67%
7. What determines the classification of a patient as a neurology patient? Check all that apply. (*Answers*) Physician referral = 46.05%, specific symptom list = 84.65%, other (list) 3.23% (usually examination)
8. Is the prescreen used to determine the amount of time scheduled for the patient's first visit? (*Answers*) Yes = 44.85% or No = 55.35%
9. Approximately, what percentage of your new patients present as neurological patients? (*Answers*) Full range of answers.
10. Do you have new patient paperwork that the patient completes prior to seeing the physician? (Who initiates it, how frequently and how important) (*Answers*) Receptionist was most frequent answer at 70.75%. On new patients, every day and extremely important.
11. If more than one person initiates it, who else? How frequently and how important?
12. Does your new patient paperwork include (information, frequency, and importance):

- a. personal information = patients answer independently
- b. consent for insurance = patients answer independently
- c. emergency contact = patients answer independently
- d. medical history = patient interacting with chiropractic neurologist 71.5%
- e. informed consent for treatment = patient interacting with chiropractic neurologist 66.6%
- f. complaint and current symptoms = patient interacting with chiropractic neurologist 75.2%
- g. systems review = chiropractic neurologist 51.87%
- h. questions about neuraxis = chiropractic neurologist 58.41%

Survey 2: Patient Exam-Vital Signs & Cranial Nerves

1. Respondent ID
2. After reviewing the patient pre-examination paperwork, which of the following best describes what you do?

Items	Percent Yes
A problem focused history only looking at the patient's presenting problem	0.5%
A problem focused history that you modify based on patient's response	25.5%
A comprehensive history: pain, family, social, travel, past medical & ROS on all new patients	73.9%

3. Which one of the following best describes your physical examination?

Items	Percent Yes
A focused physical examination based on the complaint and history	4.9%
A primarily focused physical examination intensifying around abnormal findings	20.7%
A standard comprehensive physical examination for every new patient (sensory, motor, reflexes, cranial nerves, cerebellum/balance, cognitive function, and autonomic evaluation)	74.5%

4. Approximately, how many new patient exams do you perform a week?
Range from 1 to 25 with mean of 10.

5. Do you review and discuss a new patient's history as part of the exam?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Importance Weight
Do you review and discuss a new patient's history as a part of the exam?	97.83%	91%	3.55

Initial Exam Section of Survey 2

1. Do you take vital signs?

Item	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Do you take the patient's vital signs?	68%	2.83	3.41

2. What vital signs do you check? All that apply.

Items	Percent Yes
Temperature	43.5%
Pulse: One side	26.8%
Pulse: Bilateral	72.6%
Respirations	72.0%
Blood Pressure: One side	16.1%
Blood Pressure: Bilaterally	87.5%
Blood Pressure: Sitting	63.1%
Blood Pressure: Lying	20.2%
Blood Pressure: Standing	19.6%
Height	64.3%
Weight	68.5%
Pulse Oxygen level	84.5%
Peripheral Perfusion Index: One side	3.6%
Peripheral Perfusion Index: Bilaterally	42.3%

3. Does your new patient exam include Cranial Nerve 1: Olfaction?

Items	Percent Yes	Frequency Weight	Importance Weight
Olfaction: Test?	83.23%	2.16	2.75
Each side perceives?	86.50%	2.22	2.83
Each side identifies scent?	81.86%	2.18	2.75

4. Does your new patient exam include Cranial Nerve 2?

Items	Percent Yes	Frequency Weight	Importance Weight
Vision: Snellen (Distance visual acuity)?	46.67%	1.63	2.38
Near Visual Acuity?	58.75%	1.86	2.50
Visual Field?	89.09%	2.78	3.00
Fundoscopic?	93.90%	3.01	3.18

5. Does your new patient exam include Cranial Nerve 3?

Items	Percent Yes	Frequency Weight	Importance Weight
Oculomotor:	98.21%	2.87	3.34
Measure pupil diameter?	74.25%	2.39	3.03
Direct pupillary light reflex?	96.41%	2.85	3.33
Consensual pupillary light reflex?	98.20%	2.91	3.34
Corneal light reflection?	83.83%	2.44	2.95
Response to near vision?	82.04%	2.36	2.95
Repeated convergence?	93.41%	2.73	3.18
Cover/Uncover?	70.12%	2.07	2.90

6. Does your new patient exam include Cranial Nerve 3,4 and 6: H-Pattern?

Percent Yes	Frequency Weight	Importance Weight
98.21%	2.95	3.4

7. Does your new patient exam include CN5: Trigeminal?

Items	Percent Yes	Frequency Weight	Importance Weight
Deviation of jaw?	88.10%	2.58	2.84
Palpate TMJ for prominence/clicks on opening & closing?	89.82%	2.54	2.80
Sensation on V1, V2 & V3 touch?	88.10%	2.53	3.03
Sensation on V1, V2 & V3 sharp?	90.18%	2.60	3.06

8. Does your new patient exam include CN5 & CN7?

Items	Percent Yes	Frequency Weight	Importance Weight
Corneal Reflex one time?	83.13%	2.25	2.84
Corneal Reflex to summation comparing side to side?	64.24%	2.10	2.77

9. Does your new patient exam include CNII: Facial Muscles of Expression?

Items	Percent Yes	Frequency Weight	Importance Weight
Frown	91.02%	2.53	2.90
Eye Closure	93.41%	2.59	2.99
Smile-volitional	94.61%	2.59	2.96
Smile-spontaneous	86.83%	2.46	2.86
Pout	65.66%	2.16	2.66
Purse lips	80.24%	2.32	2.74
Puff cheeks	82.63%	2.38	2.73
Taste: Salt?	32.74%	1.47	2.16
Taste: Sweet?	35.12%	1.54	2.21
Taste: Sour?	29.17%	1.40	2.06

10. Does your new patient exam include CN8: Hearing & Vestibular?

Items	Percent Yes	Frequency Weight	Importance Weight
Weber	91.07%	2.54	2.93
Rinne	91.62%	2.54	2.90
Infants only (startle/loud noise)	69.51%	2.14	2.82
Infants only Moro	59.51%	1.87	2.66

11. Does your new patient exam include CN9: Glossopharyngeal?

Items	Percent Yes	Frequency Weight	Importance Weight
Observe palatal atrophy?	96.43%	2.74	3.18
Taste: bitter?	22.75%	1.23	1.91

12. Does your new patient exam include CN9 and CN10: Gag?

Items	Percent Yes	Frequency Weight	Importance Weight
Gag on each side?	74.85%	2.26	2.96
Gag on each side to summation?	41.46%	1.67	2.69
In no gag, perceive touch?	54.60%	1.99	2.83
Swallow?	84.24%	2.40	2.96
Observe palatal fatigue on intonation of AHH?	83.83%	2.52	3.14

13. Does your new patient exam include CN11?

Items	Percent Yes	Frequency Weight	Importance Weight
Strength testing of upper trapezius?	94.64%	2.60	2.88
SCM strength testing?	92.86%	2.54	2.87

14. Does your new patient exam include CN12: Hypoglossal?

Items	Percent Yes	Frequency Weight	Importance Weight
Observe resting tongue for deviation in mouth?	77.38%	2.28	2.71
Deviation on protrusion of tongue?	92.86%	2.57	2.90
Equal volitional movement of tongue left & right?	74.85%	2.25	2.74
Strength of tongue push inside of cheek side to side?	82.74%	2.34	2.77

Survey 3: Physical Exam Sensory System

The purpose of this survey is to determine the Sensory System practices of a Chiropractic Neurologist for the Physical Examination.

1. Testing for Light Touch

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Evaluate touch over dermatomes in upper extremities	97.33%	93.20%	2.66	3.18
Evaluate comparison of touch perception equalities side to side in upper extremities	97.33%	93.88%	2.64	3.19
Evaluate touch over dermatomes in lower extremities	98.00%	94.52%	2.71	3.27
Evaluate comparison of touch perception equality side to side in lower extremities	98.00%	94.44%	2.68	3.25

2. Testing for Vibration

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Evaluate vibration perception over dermatomes in upper extremities	89.26%	86.81%	2.49	3.00
Evaluate cessation of vibration perception accuracy in upper extremities	77.03%	84.33%	2.23	2.79
Evaluate comparison of perception of vibration side to side in upper extremities	95.97%	91.22%	2.62	3.10
Evaluate vibration perception over dermatomes in lower extremities	89.33%	88.19%	2.55	3.07
Evaluate cessation of vibration perception accuracy in lower extremities	78.23%	86.03%	2.33	2.79
Evaluate comparison of perception of vibration side to side in lower extremities	98.63%	92.47%	2.70	3.17

3. Testing for Sharp Touch

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Evaluate sharp over dermatomes in upper extremities	98.00%	93.24%	2.64	3.05
Evaluate comparison of sharp perception equalities side to side in upper extremities	97.32%	92.62%	2.59	3.09
Evaluate sharp over dermatomes in lower extremities	98.64%	93.33%	2.65	3.08
Evaluate comparison of sharp perception equality side to side in lower extremities	97.30%	93.24%	2.64	3.12

4. Testing for Temperature

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Evaluate hot over dermatomes in upper extremities	47.33%	56.74%	1.36	2.14
Evaluate comparison of hot perception equalities side to side in upper extremities	48.00%	57.25%	1.40	2.18
Evaluate hot over dermatomes in lower extremities	49.66%	56.12%	1.36	2.14
Evaluate comparison of hot perception equality side to side in lower extremities	48.99%	57.55%	1.40	2.17
Evaluate cold over dermatomes in upper extremities	60.81%	64.58%	1.61	2.29
Evaluate comparison of cold perception equalities side to side in upper extremities	61.07%	65.52%	1.66	2.34
Evaluate cold over dermatomes in lower extremities	59.18%	64.34%	1.64	2.29
Evaluate comparison of cold perception equality side to side in lower extremities	60.14%	65.28%	1.69	2.33

Survey 4: Physical Exam: Motor Systems

The purpose of this survey is to determine the Motor System practices of a Chiropractic Neurologist for the Physical Examination.

1. Muscle Strength Testing

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Do you observe for asymmetry of bulk side to side?	98.64%	93.88%	2.95	3.26
Do you observe for soft pyramidal paresis in the upper extremity?	100.00%	95.92%	2.99	3.44
Do you observe for soft pyramidal paresis in the lower extremity?	97.26%	94.56%	2.88	3.30
Do you evaluate active range of motion in the upper extremity?	97.96%	91.78%	2.68	3.15
Do you evaluate active range of motion in the lower extremity?	97.28%	91.10%	2.66	3.08
Do you observe active range of motion in the cervical spine?	100.00%	91.78%	2.86	3.29
Do you measure range of motion in the cervical spine?	76.03%	80.15%	2.43	2.84
Do you evaluate for hypotonia (increased passive range of motion)?	89.80%	90.21%	2.58	2.99
Do you evaluate for hypertonia on passive range of motion?	91.03%	91.61%	2.62	3.11
Do you do a postural assessment?	96.60%	93.10%	2.96	3.23

Do you do a gait assessment?	97.96%	93.20%	2.71	3.20
During the gait assessment, do you instruct the patient to turn around and come back toward you?	95.21%	91.16%	2.60	3.08

2. Do grade the strength when you perform manual muscle tests?

Items	Percent Yes
Deltoid	96.6%
Biceps	95.2%
Brachioradialis	83.0%
Triceps	94.6%
Wrist extensors	96.6%
Wrist flexors	91.8%
Finger extensors	93.2%
Finger flexors	89.8%
Finger Abductors	93.9%
Finger Adductors	71.4%
Extensor Hallicis Longus	89.1%
Ankle invertors	85.0%
Ankle evertors	83.7%
Ankle dorsiflexors	91.8%
Ankle plantar flexors	86.4%
Quadriceps	89.1%
Hamstrings	88.4%
Hip flexors	95.2%
Hip extensors	77.6%
Hip abductors	78.9%
Hip adductors	77.6%

Survey 5: Physical Examination: Reflexes

The purpose of this survey is to determine the Reflex testing practices of the Chiropractic Neurologist.

1. Muscle Stretch Reflexes: Do you test the following muscle stretch reflexes?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Biceps	100.00%	94.93%	2.81	3.36
Triceps	100.00%	94.93%	2.80	3.33
Brachioradialis	98.55%	93.48%	2.76	3.28
Finger flexor	58.82%	69.60%	1.92	2.70
Patellar	100.00%	94.93%	2.82	3.34
Medial hamstring	61.76%	72.31%	1.95	2.78
Ankle	100.00%	94.93%	2.79	3.34

2. Do you reinforce (Jendrasik) any reflex that was not elicited?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Jendrasik on upper extremities	84.78%	84.67%	2.26	2.70
Jendrasik on lower extremities	88.41%	85.40%	2.30	2.70

3. Pathological Reflexes

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Do you evaluate for Hoffman's reflex?	78.68%	81.10%	1.99	2.86
Do you evaluate for Tromner's reflex	58.39%	68.85%	1.60	2.49
Do you evaluate for a Plantar response (Babinski)?	99.27%	95.52%	2.70	3.40

4. If the Plantar response elicited is extensor (non-infant), do you evaluate for:

Items	Percent Yes
Chaddock's?	73.9%
Schaefer's?	22.5%
Gordon's?	37.7%
Oppenheim's?	45.7%

5. Pathological reflexes continued:

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Do you evaluate for percussion myotonia on the thenar eminence?	91.97%	90.44%	2.35	1.29
Do you evaluate for wrist clonus?	73.33%	79.23%	2.02	1.27
Do you evaluate for ankle clonus?	93.48%	92.65%	2.41	1.21

Survey 6: Physical Exam: Cerebellum, Balance, Vestibular, Basal Ganglia, Limbic System and Cognition

The purpose of this survey is to determine the importance and frequency of use of the techniques relative to the: Cerebellum/Balance/Vestibular/Limbic & Cognitive Systems in the practice of a Chiropractic Neurologist.

1. Cerebellum/Balance/Vestibular System: Do you test the following?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Rhomberg eyes open & closed; with head positioning	99.24%	96.18%	3.14	3.49
Tandem Stance Right leg forward & then left leg forward	77.86%	79.53%	2.33	2.94
Tandem Gait	92.42%	91.54%	2.77	3.06
One leg standing eyes open & eyes closed	82.58%	87.40%	2.44	2.99
Finger to Nose eyes closed	98.48%	94.70%	3.18	3.29
Heel to shin	90.84%	93.85%	2.83	3.08
Arm raise	82.58%	87.20%	2.91	2.82
Finger to Finger eyes open & eyes closed	86.92%	91.34%	2.91	3.01
Finger to Finger moving target	83.21%	88.98%	2.34	2.84
Alternating hand movement; extended and elbow flexed	94.70%	94.62%	3.01	3.18
Thumb to each finger	71.97%	82.40%	2.28	2.69
Hypermetric saccade testing	94.66%	95.31%	3.01	3.29
OPK	96.97%	95.42%	3.01	3.36
VOR Vestibular Ocular Response Testing with & without fixation	83.97%	89.68%	2.52	3.18
Canal related eye weakness-hypo or hypertropia OPK, head position	80.15%	84.25%	2.31	3.10
Rebound and check	74.05%	82.40%	2.10	2.66

Positional testing (Dix-Hallpike, etc.)	88.64%	89.92%	2.27	3.19
Speech	94.53%	92.97%	3.04	3.15

2. Special Tests: Do you perform any of the following?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
CAPS testing (other machine testing)	26.52%	31.78%	1.31	2.42
Calorics	41.98%	51.30%	2.16	2.60
VNG	24.24%	30.91%	1.22	2.54
Imaging	69.70%	42.97%	2.83	3.02
Cerebellar antibodies	21.37%	21.30%	1.13	2.37

3. Basal Ganglia: Do you perform the following?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Finger coordinating movement (piano playing)	97.71%	95.45%	2.76	3.19
Observation of movement at rest	99.24%	96.97%	3.01	3.40
Eyes closed-observe for eye blepharospasm	94.70%	93.08%	2.87	3.19
Observation of initiation of movement	100.00%	97.73%	2.98	3.23
Observation of spontaneous saccades	96.21%	94.66%	2.80	3.20
Muscle tone	100.00%	96.21%	3.04	3.33
Pupillary light response	100.00%	96.21%	2.91	3.32
Gait/shuffling steps/turning	97.67%	93.85%	2.84	3.20

4. Limbic System: Do you test the following?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Social testing-answer questions reasonably	86.26%	86.92%	2.55	2.89
Normal questioning without outbursts	86.82%	87.60%	2.58	2.88
Emotional responses to sensory input (light, smell, pinwheel)	91.67%	90.08%	2.67	3.03
Affect-inappropriate for situation	95.35%	92.31%	2.78	3.01

5. Cognitive: Do you perform the following?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
History responses	93.94%	91.47%	2.11	3.06
Memory of sequencing	80.92%	86.18%	2.01	2.82
Oriented X3	74.62%	80.17%	1.94	2.95
Recall and interpretation of a parable	52.31%	62.61%	1.39	2.50
Mathematical Calculations	80.92%	85.48%	1.98	2.75
Right & left brain questioning	86.36%	87.60%	2.17	2.88
Conversational assessment of hyperactivity	82.44%	86.40%	1.99	2.77
General questions regarding attention and hyperactivity	83.21%	85.60%	2.03	2.80

General questions	93.18%	89.15%	2.06	2.94
Spatial orientation testing (Necker squares, mazes, spinning ballerina)	40.77%	55.14%	1.23	2.44
Long term versus short term versus immediate recall memory (not immediate but what did you have for breakfast)	79.39%	84.87%	1.97	2.78
Semantic versus episodic versus procedural memory (metabolic rate when doing testing)	35.88%	46.67%	1.06	2.29
Field of Vision	92.42%	91.41%	2.17	2.93
Blind Spot Mapping	79.39%	80.80%	1.96	2.83
Pre-motor testing versus Supplementary motor testing (internal versus external cuing)	37.98%	49.52%	1.15	2.38
Hemisphericity	96.21%	96.88%	2.09	3.35
Mood	92.19%	89.60%	1.96	2.91

6. Do you perform the following Special Tests?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Mental Status Exams	45.04%	50.89%	1.25	2.54
IQ testing	6.87%	9.18%	0.31	1.55
Imaging	62.60%	25.41%	1.38	2.69
Vascular testing	45.80%	25.86%	1.23	2.48
TOVA	6.11%	6.19%	0.27	1.66
Millon	1.53%	5.26%	0.21	1.51
MMPI	4.58%	8.33%	0.32	1.56
Neuropsychological testing	23.85%	8.74%	0.76	1.98
Blind Spot Mapping by ophthalmologist	17.56%	10.89%	0.61	1.76
Peripheral NS	54.96%	47.01%	1.54	2.50
Cortical	47.33%	48.67%	1.44	2.42

7. General Special Testing Laboratory studies: Do you perform the following?

Items	Percent Yes	Who Does It? Percent ChiroNeuro	Frequency Weight	Importance Weight
Thyroid	77.27%	45.31%	1.83	3.09
Blood sugar	76.52%	43.31%	1.82	3.11

Survey 7: Red Flag Issues

This survey deals only with the issue of critical types of presentations where, if the doctor misdiagnoses the patient, death or permanent disability is likely. These types of cases require immediate intervention or emergency transport. They occur infrequently, but every practitioner must recognize them to practice safely.

The purpose of this survey is to identify and describe Red Flag Issues that may present to the Chiropractic Neurologist.

1. Red Flag Issues:

Items	Percent Referral to ED	Who Makes Referral? ChiroNeuro	Frequency Weight	Importance Weight
Meningitis: neck rigidity, severe headache and high fever	100%	88%	0.71	3.92
Increased intracranial pressure: eye exam ophthalmoscope- bulging optic disc with severe headache on same side	91%	89%	0.74	3.80
Blood pressure: diastolic 110+ or systolic 180+; headache	59%	84%	1.21	3.51
Blood pressure adult: diastolic 50- or systolic 80- with presenting symptoms	58%	86%	0.90	3.40
Heart Rate/Rhythm: presentation: SOB, diaphoresis, chest pain, left arm pain, thoracic back pain; Rate above 140+ at rest with no medication indicator	99%	86%	0.79	3.91
Cauda Equina Syndrome- disc patients: saddle pain, inability to urinate, urinate or defecate without knowing it	93%	87%	0.72	3.76

Cavernous Sinus Syndrome: fever, head/face pain, infection in nasal triangle	78%	85%	0.63	3.59
Subarachnoid hemorrhage (subdural, epidural): “worst headache I’ve ever had”	99%	88%	0.67	3.94
Blood sugar non-fasting: below 50mg	54%	85%	0.69	3.49
Blood sugar non-fasting: above 300 mg/deciliter with no history of diabetes and with diaphoresis, lowered level of alertness	74%	83%	0.71	3.60
Sepsis: Blood sugar above 120 fasting in non-diabetic patient: look for sepsis and ship; fever or abnormally low for individual (>97 <100); HR >100 bpm; Resp rate > 20 cpm	88%	84%	0.58	3.63
Emergent Stroke: lethargy, lower level of consciousness	100%	88%	0.64	3.93
Respiration: below 7 and above 20 OR in a known patient plus or minus 5 either direction at rest with altered breath sounds	77%	86%	0.58	3.63
Visual field defects: Pie in sky/ floor; hemifield loss; Quadrantanopia; loss of central vision; peripheral visual loss (tunnel vision)	74%	87%	0.72	3.56
Temperature: hypothermia below 96 core/95 oral; hyperthermia above 103 core/102 oral; history of vomiting	84%	84%	0.57	3.57

Projectile vomiting or unremitting vomiting	92%	84%	0.62	3.51
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Survey Sections on Cognitive Information and Management Decisions
Surveys 8 through 22

Survey 8: Theory of the Neuron

Understanding neuron theory is the microscopic basis for everything that the Chiropractic Neurologist does in treating patients. It is important for increased activation and more life or decreased activation and cell death or too sudden activation in a weakened cell resulting in cell death. The purpose of this survey is to determine the frequency and importance of the cognitive information and the patient management decisions used.

1. Please indicate how important knowledge of the each of the following principles of functional anatomy is to the practice of chiropractic neurology and how frequently you use each in your practice.

Items	Frequency Weight	Importance Weight
A. Cell wall	2.66	2.63
B. Nucleus	2.59	2.59
C. Mitochondria	2.96	3.03
D. Endoplasmic Reticulum	2.26	2.34
E. Ribosomes	2.20	2.33
F. Lysosomes	2.12	2.20
G. Micro Tubules	2.15	2.26
H. Axons	3.09	2.98
I. Dendrites	3.05	2.99
J. Receptors	3.23	3.26
1. Ca	3.07	2.94
2. K	3.02	2.94
3. Na	3.03	2.94
4. NMDA	2.88	2.88
K. Golgi apparatus	2.46	2.52

2. Please indicate how important knowledge of the following disease processes/diagnoses is to the practice of chiropractic neurology and how frequently you use this knowledge in your practice and how you manage patients with these issues.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Disorder of the cell will be because of the following:			
1. Energy failure	2.98	3.07	0.83
2. Swelling of the cell	2.54	2.84	0.74
3. Membrane rupture	2.30	2.88	0.53
4. Inflammation	3.35	3.33	0.82
5. Nuclear & cytoplasmic disintegration	2.17	2.81	0.51
6. Programmed cell death	2.01	2.67	0.61
B. Apoptotic Pathway #1	1.90	2.63	0.57
C. Apoptotic Pathway #2	1.90	2.62	0.55
D. All of the disorders that the body goes through are a result of the failure of the cell proliferation. We are either proliferating the cells or destroying them.	2.78	2.98	0.70

3. Please indicate how important the following rehabilitation principles/treatment modalities are and how frequently you use these in your practice.

Items	Frequency Weight	Importance Weight
A. Rehabilitation or treatment		
1. Increase activation	3.50	3.63
2. Inhibit activation	3.48	3.55
3. Promote cell proliferation by increasing fuel delivery but not exceeding the metabolic rate of the area being stimulated.	3.31	3.62
B. Specific adjustments will increase O ₂	3.48	3.54
C. Specific Adjustments will increase activation.	3.52	3.60
D. Nutrition to increase activation.	3.35	3.53

4. Please indicate how important the following diagnostic issues are to the chiropractic neurologist and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. Blood work	2.90	3.12
B. SPO ₂	3.07	3.25
C. Saliva Tests	1.91	2.36
D. Hair analysis	0.98	1.61
E. EMG & NCV	2.43	2.93

Survey 9: Cognitive Area: Receptors

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used in the area of Receptors.

1. Sensory Receptors

Items	Frequency Weight	Importance Weight
A. Retinal receptors-rods and cones	2.78	2.76
B. Olfactory receptors-chemoreceptors-not integrated through thalamus-memory linked-direct link to limbic	2.88	2.86
C. Gustatory receptors-taste-chemoreceptors-integrated through thalamus-sweet, salty, bitter, sour	2.37	2.60
D. Auditory-cochlea-mechanoreceptor-hertz and decibel-speech perception (512)-low tone (128)-mid level (256)-localization-phase-reflex (orienting)-dampening reflex (CN 5&7)	2.74	2.76
E. Vestibular-semicircular canals, utricle, saccule-hair cells are the receptors-dynamic and static division-connected with eyes and eye movements-8th CN-cerebellum connection (vestibular nuclei)	3.40	3.31
F. Cutaneous receptors - free and encapsulated	3.33	3.07
G. Proprioceptors - joint mechanoreceptors, muscle spindles, Golgi tendon organs	3.54	3.49
H. Visceral - mechano (stretch/baro) and chemoreceptors	3.14	2.96

2. Disease Process Issues: Retina

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
Age related macular degeneration	2.04	2.75	0.09
Diabetic retinopathy	2.28	2.97	0.12
Papilledema	1.99	3.19	0.05
Retinal detachment	1.76	3.27	0.04

3. Disease Process Issues: Olfactory

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
Rhinitis	2.77	2.22	0.50
Nasal obstruction (mass/developmental/post-surgical)	1.72	2.52	0.06
Toxic damage (inhalants)	1.74	2.74	0.14
Trauma, age related degeneration	2.51	2.69	0.48

4. Disease Process Issues: Gustatory

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
Upper respiratory/oral infections	2.65	2.61	0.25
Toxic exposure	2.00	2.81	0.16
Dental	2.17	2.50	0.07
Nutritional deficiencies	3.03	3.13	0.80
Olfactory related disorder	2.28	2.51	0.29
Age related degeneration	2.68	2.51	0.60

5. Disease Process Issues: Cochlear

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
Noise induced	2.38	2.49	0.40
Drug exposure	2.13	2.66	0.21
Fistula	1.80	2.84	0.14
Meniere's	2.45	3.04	0.72
Age related degeneration	2.75	2.69	0.65

6. Disease Process Issues: Vestibular

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
Infection	2.16	3.16	0.13
BPPV	2.81	3.18	0.94
Fistula	1.86	2.94	0.17
Menière's	2.50	3.08	0.73

7. Disease Process Issues: Cutaneous

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
Trauma	2.61	2.80	0.35
Sensitization	2.74	2.88	0.79

8. Disease Process Issues: Proprioceptors

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
Trauma	2.61	2.80	0.35
Sensitization	2.74	2.88	0.79

9. Disease Process Issues: Visceral

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
Infection	2.18	3.27	0.06
Primary disease of organs	2.29	3.28	0.08

10. Rehabilitation Principles

Items	Frequency Weight	Importance Weight
1. Environmental receptors transduce external stimulus into an electrochemical event that may change the CNS	3.20	3.35
2. To achieve great probability of CNS change: fast adapting receptors need to be stimulated with varying amplitudes or patterns	3.39	3.40
3. To achieve great probability of CNS change: slowly adapting receptors will maintain a change in firing rate with a new, but constant stimulus	3.33	3.38
4. Receptors that fire frequently (slowly adapting or associated with a frequently changing system) and are very responsive to change (high sensitivity) often have the greatest CNS input; these are mostly proprioceptors and vestibular receptors	3.38	3.44

11. Rehabilitation Applications

Items	Frequency Weight	Importance Weight
Visual stimulus and filtering	3.36	3.14
Auditory training with tones, clicks and music	3.13	3.05
Olfactory and gustatory stimulus techniques	2.88	2.88
Vestibular training (yaw, pitch and roll)	3.32	3.31
Therapeutic caloric	2.38	2.93
Canalith repositioning	2.92	3.25
Crude and accurate touch stimulation	3.13	2.89
Chiropractic adjusting technique	3.68	3.63
Range of motion therapeutics (resistance training, stretch, muscle work)	3.73	3.44

12. Diagnostic issues in which the chiropractic neurologist is skilled

Items	Frequency Weight	Importance Weight
Visual stimulus and filtering	3.36	3.14
Auditory training with tones, clicks and music	3.13	3.05
Olfactory and gustatory stimulus techniques	2.88	2.88
Vestibular training (yaw, pitch and roll)	3.32	3.31
Therapeutic caloric	2.38	2.93
Canalith repositioning	2.92	3.25
Crude and accurate touch stimulation	3.13	2.89
Chiropractic adjusting technique	3.68	3.63
Range of motion therapeutics (resistance training, stretch, muscle work)	3.73	3.44

Survey 10: Cognitive Area: Peripheral Nerves

The purpose of this survey is to determine the frequency and importance of the cognitive information and treatment modalities used by the chiropractic neurologist. These additional demographic questions will assist in the data analysis.

1. I have completed a 120-150 hour Electro-diagnostics Class

Items	Response Percent
Yes	14.4%
No	85.6%

2. I have X-ray facilities in my office:

Items	Response Percent
Yes	41.3%
No	58.7%

Content Items:

3. Please indicate how important the following functional Neuroanatomy is in your practice and how frequently you use this information?

Items	Frequency Weight	Importance Weight
A. Gross anatomy and relationship of a root to the vertebral column	3.53	3.46
a. Motor roots	3.50	3.41
b. Sensory roots	3.50	3.38
c. both Motor and Sensory Roots	3.49	3.38
B. Gross anatomy of the Brachial Plexus	3.34	3.28
a. upper, middle and lower trunk	3.11	3.13
b. lateral, medial and posterior cord	3.15	3.13
C. Sensory	3.52	3.33
D. Peripheral Nerves	3.56	3.36
a. lateral antibrachial cutaneous	3.00	3.01
b. medial antibrachial cutaneous	3.01	2.99

c. median	3.46	3.23
d. palmar median	3.29	3.12
e. ulnar	3.41	3.22
f. palmar ulnar	3.10	3.04
g. dorsal ulnar	2.99	2.98
h. superficial radial	3.06	3.01
i. radial	3.35	3.22
j. sural	2.97	2.97
k. superficial peroneal	3.14	3.05
l. medial and lateral plantar	3.01	3.00
m. saphenous	2.88	2.94
n. lateral femoral	3.14	3.01
o. cutaneous	3.07	3.00
p. cluneal nerves	2.58	2.73
q. obturator	2.95	2.91
E. Motor Peripheral Nerves	3.44	3.19
a. axillary	3.17	3.11
b. radial	3.31	3.18
c. deep radial	2.93	2.95
d. ulnar	3.34	3.18
e. median	3.38	3.20
f. anterior interosseous	2.95	2.95
g. femoral	3.19	3.08
h. obturator	2.97	2.95
i. superior gluteal	3.02	2.93
j. inferior gluteal	2.96	2.91
k. sciatic	3.56	3.27
l. superficial peroneal	3.24	3.05
m. deep peroneal	3.07	2.98
n. tibial	3.25	3.11
o. medial and lateral plantar	3.04	2.95

4. Please indicate how important knowledge of these disorders is and how frequently you see each of them in your practice and how you manage patients with them.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. motor root lesion	2.99	2.26	0.78
B. sensory root lesion	3.09	2.28	0.81
C. motor & sensory root lesion	2.96	2.36	0.77
D. compressive root mechanisms	3.25	2.38	0.76
a. disc lesion	3.48	2.34	0.93
b. inflammatory lesion (Sclerotogenous pain referral)	3.43	2.30	0.84
E. trauma	3.33	2.19	0.70
a. biomechanical, i.e., lifting	3.52	2.26	0.96
b. motor vehicle accident	3.11	2.25	0.90
c. vertebral fracture	2.10	2.68	0.16
d. vertebral compression fracture	2.21	2.51	0.31
F. brachial plexus lesions	2.44	2.23	0.58
a. Erbs Palsy (upper brachial plexus lesion)	2.02	2.27	0.52
b. lateral traction injury	2.04	2.16	0.46
c. Klumpke Palsy (lower brachial plexus lesion)	2.06	2.23	0.46
G. lumbosacral plexus Lesions	2.63	2.25	0.69
a. lumbar plexus lesion	2.59	2.30	0.70
b. sacral plexus lesion	2.43	2.28	0.67
H. intrapment neuropathies	2.99	2.25	0.83
a. radial nerve	2.63	2.16	0.90
1. crutch palsy	2.02	2.14	0.80
2. Saturday Night Palsy	2.07	2.10	0.86

3. supinator syndrome	2.37	2.10	0.89
4. handcuff neuropathy	1.77	2.07	0.77
b. median nerve	2.96	2.17	0.92
1. pronator syndrome	2.67	2.18	0.93
2. carpal tunnel syndrome	2.98	2.25	0.92
c. ulnar nerve	2.68	2.15	0.92
1. retro cubital tunnel syndrome	2.07	2.18	0.85
2. cubital tunnel syndrome	2.25	2.14	0.86
3. Canal of Guyon (Pisiform-Hamate) syndrome	2.21	2.16	0.86
4. ulnar nerve lesion in hand	2.27	2.18	0.79
d. anterior Interosseous syndrome	2.10	2.24	0.83
e. sciatic palsy	2.54	2.19	0.83
f. tibial Nerve	2.31	2.11	0.83
1. Baker's cyst	2.27	2.12	0.50
2. tarsal tunnel syndrome	2.22	2.20	0.85
g. peroneal nerve	2.48	2.18	0.89
1. lesion at fibular head	2.47	2.15	0.87
2. anterior tarsal tunnel syndrome	2.07	2.14	0.81
I. Systemic peripheral neuropathy	2.53	2.32	0.48
a. diabetic neuropathy	2.85	2.47	0.37
b. Charcot-Marie-Tooth syndrome	1.92	2.36	0.31
c. lead neuropathy	1.59	2.35	0.25
d. acromegaly	1.51	2.09	0.22
e. pernicious anemia	2.15	2.25	0.33
f. Friedreich's ataxia	1.89	2.22	0.35
g. alcoholic neuropathy	2.19	2.19	0.34
h. rheumatoid arthritis	2.83	2.31	0.42

5. Please indicate how important these Diagnostic Procedures are with respect to peripheral nerve lesions and how frequently you use them in your practice, and who performs them (management).

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
1. Cervical MRI	2.79	3.20	0.65
2. Thoracic MRI	2.23	2.96	0.61
3. Lumbosacral MRI	2.86	3.18	0.68
4. Shoulder MRI	2.34	2.90	0.55
a. brachial plexus	2.16	2.96	0.61
b. shoulder soft tissue	2.45	2.88	0.67
5. Upper extremity Nerve conduction velocity testing without needle EMG	1.85	2.76	0.52
6. Upper extremity Nerve Conduction velocity testing with needle EMG	2.10	2.96	0.51
7. Lower extremity Nerve conduction velocity testing without needle EMG	1.83	2.76	0.52
8. Lower extremity Nerve Conduction velocity testing with needle EMG	2.07	2.94	0.51
9. Laboratory testing	3.02	3.15	0.62
a. heavy metals	2.10	2.90	0.49
b. serum B12	2.54	2.96	0.57
c. Complete Blood Count	2.82	3.17	0.60
d. Comprehensive Metabolic Profile	2.72	3.10	0.61
e. Urinalysis	2.55	2.84	0.56
f. Genetic testing	1.48	2.57	0.35
g. Hair analysis	1.27	1.95	0.53
h. Neuro- transmitter testing	1.74	2.44	0.57
10. Cardiac testing	2.20	2.94	0.18
a. Doppler	1.99	2.82	0.16
b. ECG	1.90	2.89	0.13

c. Echo Cardiogram	1.81	2.75	0.13
d. Cardiac Stress test	1.90	2.77	0.13
11. Xray:	3.28	3.05	0.86
a. cervical spine	3.28	3.07	0.86
b. thoracic spine	3.04	2.96	0.86
c. lumbosacral spine	3.23	3.07	0.86
d. shoulder series	2.65	2.85	0.80
e. elbow series	2.19	2.74	0.76
f. wrist series	2.27	2.73	0.76
g. hand series	2.18	2.69	0.78
h. hip series	2.54	2.90	0.80
i. knee series	2.40	2.83	0.78
m. ankle series	2.23	2.75	0.77
n. foot series	2.17	2.77	0.77

6. Please indicate how important these Referrals are with respect to peripheral nerve lesions and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. Refer only until a definitive cause is known:	2.54	2.80
1. Orthopedic Surgeon	2.50	3.01
2. Neurosurgeon	2.48	2.92
3. Cardiologist	2.17	2.71
4. Endocrinologist	2.12	2.78
5. Primary Care Physician (if not you)	2.80	2.58
6. Rheumatologist	2.12	2.84
B. Refer and Co-treat with other practitioner	2.86	2.43
1. Physical Therapist	2.29	2.33
2. Occupational therapist	1.85	2.69
3. Primary Care Physician (if not you)	2.76	2.95
C. Treat without Co-Management	3.47	3.05
D. Refer based upon outcome of initial trial therapy	2.89	2.78

7. Please indicate how important these treatment modalities are with respect to peripheral nerve issues and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. spinal manipulation	3.74	3.63
B. extremity manipulation	3.72	3.55
C. Nutritional support (vitamins, minerals)	3.49	3.32
D. muscle tone modulation	3.44	3.27
1. Electrical muscle stimulation	2.76	2.73
2. myofacial release	3.47	2.95
3. acupuncture	1.30	1.87
4. massage	2.75	2.38
5. cold laser	1.69	2.23
6. fast stretch	3.73	3.37
7. slow stretch	3.64	3.26
E. Thermotherapy (hot or cold)	3.01	2.63
F. central integrated state (to increase or decrease)	3.58	3.52

8. Please indicate how important the rehabilitation principles are with respect to peripheral nerve issues and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
Physical Rehab in office	3.38	3.37
Physical Rehab at home	3.52	3.42
Cortical stimulation	3.50	3.49

Survey 11: Content Area: Spinal Cord

The purpose of this survey is to identify the importance and the frequency of chiropractic neurologists' use of knowledge with respect to the Spinal Cord.

1. Functional Neuroanatomy

Items	Frequency Weight	Importance Weight
A. Gross anatomy and relationship with vertebral column	2.82	3.66
B. Main Nuclear groups: Dorsal Horn	2.60	3.38
C. Main Nuclear groups: Intermediate	2.58	3.32
D. Main Nuclear groups: Ventral Horn	2.65	3.36
E. Main Nuclear groups: (Rexed Lamina)	2.33	3.01
F. White matter pathways: Sensory	2.73	3.42
G. White matter pathways: Motor	2.74	3.46
H. Spinal nerves and their roots	2.82	3.54
I. Functional relationships: Segmental reflexes	2.83	3.42
J. Functional relationships: Homologous columns	2.79	3.51
K. Vasculature	2.56	3.44

2. Disorders

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Spinal Cord Injury: Lateral lesion	1.48	3.43	0.36
B. Spinal Cord Injury: Anterior lesion	1.54	3.44	0.32
C. Spinal Cord Injury: Posterior lesion	1.48	3.43	0.34
D. Spinal Cord Injury: Complete lesion	0.99	3.48	0.18
E. Compressive mechanisms	1.98	3.46	0.50
F. Syrinx	1.13	3.37	0.18
G. Ventral horn cell disease	1.12	3.42	0.22
H. Multiple sclerosis	1.77	3.45	0.35
I. Dorsal column disease	1.43	3.38	0.27
J. Vascular disease	1.66	3.46	0.18
K. Cauda Equina Syndrome	1.11	3.55	0.12

3. Rehabilitation Principles

Items	Frequency Weight	Importance Weight
1. Central vs Peripheral nerve lesions and limitations to regeneration	2.19	3.32
2. Segmental relationships	2.55	3.33
3. Peripheral signaling into cord	2.56	3.33
4. Suprasegmental signaling into cord	2.57	3.31
5. Decompression and vascular controls	2.26	3.24
6. Metabolic capacity	2.69	3.40
7. Central integrated state and potential for plastic change	2.80	3.53
8. To achieve great probability of CNS change: fast adapting receptors need to be stimulated with varying amplitudes or patterns	2.57	3.37

9. To achieve great probability of CNS change: slowly adapting receptors will maintain a change in firing rate with a new, but constant stimulus	2.51	3.32
10. Receptors that fire frequently (slowly adapting or associated with a frequently changing system) and are very responsive to change (high sensitivity) often have the greatest CNS input; these are mostly proprioceptors and vestibular receptors	2.68	3.44

4. Rehabilitation Applications

Items	Frequency Weight	Importance Weight
1. Cross crawl	2.43	3.19
3. Vestibular reflexes	2.68	3.52
4. Bladder control	1.86	3.08
5. Gait retraining	2.24	3.19
6. Brain based therapies	2.69	3.52
7. Crude touch, pain, temperature and accurate touch modalities	2.28	3.14
8. Chiropractic adjusting technique	2.95	3.57
9. Range of motion therapeutics (resistance training, stretch, muscle work)	2.81	3.29
10. Mental imagery	2.14	2.99

5. Diagnostic Issues

Items	Frequency Weight	Importance Weight
A. History taking differentiating spinal cord lesions from lesions elsewhere	2.74	3.61
B. Complete neurological examination with emphasis on: Muscle spindle reflexes	2.74	3.40
C. Complete neurological examination with emphasis on: Strength	2.68	3.34

D. Complete neurological examination with emphasis on: Primitive reflexes	2.25	3.07
E. Complete neurological examination with emphasis on: Assessment of tone	2.66	3.34
F. Complete neurological examination with emphasis on: Tactile sensation testing	2.56	3.19
G. Localization of spinal cord lesions at different levels	2.52	3.48
H. Differentiating between a single lesion, multiple lesions and systemic lesions	2.55	3.57

Survey 12: Cognitive Area: Brainstem

The purpose of this survey is to identify the importance and frequency of chiropractic neurologists' use of knowledge with respect to the brainstem.

1. Functional Neuroanatomy

Items	Frequency Weight	Importance Weight
A. Gross anatomy and relationship with cranial structures	3.02	3.44
B. Neocortical and Paleocortical relationships	2.72	3.16
C. Relationships with deep cerebral nuclei and cerebellum	2.93	3.37
D. Medulla Pathways	2.80	3.33
E. Medulla Cranial nerves and their nuclei	2.91	3.40
F. Medulla Other nuclei and reticular formation	2.81	3.32
G. Medulla Vasculature	2.39	3.27
H. Pons Pathways	2.82	3.36
I. Pons Cranial nerves and their nuclei	2.84	3.39
J. Pons Other nuclei and reticular formation	2.74	3.31
K. Pons Vasculature	2.35	3.26
L. Mesencephelon Pathways	2.89	3.39
M. Mesencephelon Cranial nerves and their nuclei	2.96	3.41
N. Mesencephelon Other nuclei and reticular formation	2.77	3.33
O. Mesencephelon Vasculature	2.40	3.22

2. Disorders

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. White matter disease	1.86	3.24	0.35
B. Ventricular lesions	1.37	3.15	0.21
C. Medulla ventral	1.70	3.21	0.45
D. Medulla Lateral	1.71	3.18	0.44
E. Medulla Craniocervical junction	1.91	3.22	0.48
F. Medulla Integrative	2.64	3.26	0.76
G. Pons Ventral	1.91	3.16	0.52
H. Pons Dorsal	1.83	3.19	0.49
I. Pons Lateral	1.76	3.15	0.49
J. Pons Paramedian	1.89	3.15	0.54
K. Pons Integrative	2.75	3.27	0.77
L. Mesencephelon Tegmental	2.14	3.25	0.58
M. Mesencephelon Tectal	2.16	3.24	0.60
N. Mesencephelon Integrative	2.81	3.29	0.77

3. Rehabilitation Principles

Items	Frequency Weight	Importance Weight
1. Central vs Peripheral nerve lesions and limitations to regeneration	2.63	3.40
2. Segmental relationships	2.66	3.32
3. Peripheral signaling into brainstem	2.71	3.45
4. Suprasegmental signaling into brainstem	2.78	3.42
5. Metabolic capacity	2.82	3.52
6. Central integrated state and potential for plastic change	2.93	3.56
7. To achieve great probability of CNS change: fast adapting receptors need to be stimulated with varying amplitudes or patterns	2.73	3.40

8. To achieve great probability of CNS change: slowly adapting receptors will maintain a change in firing rate with a new, but constant stimulus	2.68	3.38
9. Receptors that fire frequently (slowly adapting or associated with a frequently changing system) and are very responsive to change (high sensitivity) often have the greatest CNS input; these are mostly proprioceptors and vestibular receptors	2.77	3.42

4. Rehabilitation Applications

Items	Frequency Weight	Importance Weight
1. Cranial nerve activation	2.91	3.35
2. Cross crawl	2.61	3.14
3. Segmental spindle and GTO reflexes	3.14	3.34
4. Vestibular reflexes	3.11	3.45
5. Autonomic controls	2.94	3.34
6. Gait retraining	2.52	3.06
7. Brain based therapies	3.07	3.44
8. Crude touch, pain, temperature and accurate touch modalities	2.61	3.07
9. Chiropractic adjusting technique	3.47	3.58
10. Range of motion therapeutics (resistance training, stretch, muscle work)	3.29	3.31
11. Mental imagery	2.33	2.90
12. Desensitization	2.19	2.85
13. Sleep patterning	2.01	2.80
14. Breathing exercises	2.82	3.22

5. Diagnostic Issues

Items	Frequency Weight	Importance Weight
A. History taking differentiating brainstem lesions from lesions elsewhere	3.08	3.53
B. Complete neurological examination with emphasis on: Cranial nerve testing	3.01	3.48
C. Complete neurological examination with emphasis on: Vitals	3.02	3.37
D. Complete neurological examination with emphasis on: Muscle spindle reflexes	3.08	3.34
E. Complete neurological examination with emphasis on: Strength	3.11	3.34
F. Complete neurological examination with emphasis on: Primitive reflexes	2.57	3.09
G. Complete neurological examination with emphasis on: Assessment of tone	3.03	3.33
H. Complete neurological examination with emphasis on: Tactile sensation testing	2.82	3.17
I. Localization of brainstem lesions at different levels	2.81	3.41
J. Differentiating between a single lesion, multiple lesions and systemic lesions	2.92	3.56

Survey 13: Cognitive Area: Cranial Nerves

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used.

1. Please rate the following functional Neuroanatomy according to its importance to your practice and the frequency you use it in your practice.

Items	Frequency Weight	Importance Weight
1. Olfactory-tract-bulb-olfactory cortex	3.02	2.72
2. Optic nerve chiasm-tract-lateral geniculate	3.18	2.88
3. Oculomotor nerve-midbrain	3.38	3.11
a. Edinger-Westphal nucleus	3.33	3.12
4. Trochlear nerve-midbrain	3.32	3.07
5. Trigeminal nerve-pons/midbrain	3.30	3.01
6. Abducens nerve-pons	3.36	3.09
7. Facial-nerve-pons	3.31	2.93
a. Superior salvatory n.	3.07	2.74
8. Vestibular cochlear-pons sva (special visceral afferent)	3.23	2.93
9. Glossopharyngeal –medulla	3.19	2.89
a. Inferior salvatory n.	2.91	2.71
10. Vagus nerve-medulla	3.30	2.96
a. Nucleus tractus solitarius	3.17	2.93
11. Spinal accessory-medulla/cord	3.26	2.94
12. Hypoglossal-nerve-medulla	3.21	2.89

2. Please rate the following function/physiology according to its importance to your practice and the frequency you use it in your practice.

Items	Frequency Weight	Importance Weight
A. Sensory		
1. GSA (general somatic afferent)- -touch, pain, temperature, proprioception-V, VII, IX, X	3.42	3.28
2. SSA (special somatic afferent)-- hearing, balance-VIII	3.43	3.39
3. GVA (general visceral afferent)-- mechanical, chemosensory-V, VII, IX, X	3.26	3.21
4. SVA (special visceral afferent)- -taste, olfaction-I, VII, IX, X	3.07	3.07
B. Motor		
1. GSE (general somatic efferent)- -skeletal muscle control- III, VI, IX, XII	3.46	3.36
2. GVE (general visceral efferent)- -autonomic control-III, VII, IX, X	3.37	3.29
3. SVE (special visceral efferent)-- brachiomeric control- V, VII, IX, X, XI	3.19	3.11

3. Please rate the following Disorders according to the importance of being able to diagnose them and how frequently you see them in your practice and how they are managed.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
1. Tumors-locations	1.94	3.56	0.04
2. Vasculature	2.39	3.59	0.11
a. TIA—transient ischemic attack	2.17	3.57	0.16
b. Stroke	2.20	3.68	0.09
c. AVM—arteriovenous malformation	1.67	3.42	0.06
d. aneurysm	1.81	3.59	0.06
3. Trauma	2.92	3.48	0.43
4. Infection	2.39	3.53	0.09
5. Congenital anomalies	2.46	3.20	0.40
6. Plasticity/deafferentation	3.47	3.57	0.91
7. Hemisphericity	3.59	3.57	0.93
8. Macular degeneration, RAPD—relative afferent papillary defect	2.10	3.23	0.21
9. Nerve palsies—CN III, Facial	2.37	3.34	0.56

4. Please rate the following rehabilitation principles as to their importance in your practice and the frequency that you use them in your practice.

Items	Frequency Weight	Importance Weight
A. Restore/maintain-fuel	3.46	3.54
B. Surgical referral – removal/eliminate/repair frank pathology	2.19	3.44
C. Monitor metabolic capacity	3.33	3.51
D. Improve plasticity	3.47	3.57
1. Active activation	3.57	3.50
2. Active inhibition	3.53	3.51
E. Create symmetry/balance in functionality from right and left	3.49	3.63

5. Please rate the following rehabilitation applications/treatment modalities as to the importance in your practice and how frequently you use them.

Items	Frequency Weight	Importance Weight
A. Olfaction:	2.56	2.78
1. Olfaction identification-peppermint/lavender	2.74	2.81
2. Olfaction localization	2.54	2.65
B. Visual-	3.20	3.05
1. hemifield stimulation	2.90	3.01
2. Color stimulation	2.92	2.94
3. Optokinetic stimulation	3.42	3.20
4. Accommodation exercises	3.08	3.02
5. Localization	2.74	2.82
6. Blocking techniques	2.14	2.53
C. Oculomotor-	3.52	3.29
1. Saccades	3.43	3.31
2. CN 3/4/6	3.13	3.16
3. Pursuits	3.45	3.33
4. VOR—Vestibular Ocular reflex	3.35	3.23
5. OPK—optokinetic	3.51	3.29
6. Memorized targets	2.30	2.59
D. Edinger-Westphal	3.21	3.20

1. Light stimulation- frequency/color/intensity	3.04	3.03
2. Accommodation-near/far exercises	2.93	2.93
E. Trigeminal-	2.95	3.00
1. Therapeutic exercises -chewing	2.39	2.62
2. Myofascial release	3.10	2.92
3. Manipulation	3.37	3.29
4. Sensory stimulation-V-I,V-II,V- III	2.89	2.88
F. Facial-	2.96	2.95
1. Muscle activation	2.89	2.90
2. Cortical based facial expression	2.70	2.82
3. Limbic based facial expression	2.61	2.80
G. Superior Sallivatory Nucleus-	2.71	2.74
1. Corneal stimulation	2.48	2.76
2. Gag stimulation	2.58	2.76
3. Caloric stimulation	2.34	2.90
4. Odor stimulation	2.36	2.63
H. Cochlear-	2.67	2.88
1. Tone recognition	2.15	2.61
2. Sound localization	2.40	2.67
3. Rhythm	2.47	2.74
4. Metronome	2.60	2.78
5. Music	2.74	2.83
6. Blocking techniques	2.13	2.47
I. Vestibular-	3.23	3.16
1. Angular acceleration	2.79	3.08
2. Linear acceleration	2.50	2.94
3. Visualization	2.76	2.81
J. Glossopharyngeal-	2.48	2.66
1. Taste stimulation	2.06	2.56
K. ISN (inferior salivatory nucleus) -	2.17	2.45
1. Taste stimulation	1.98	2.49
2. Visualization of taste	1.58	2.27
L. Vagus-	2.74	2.95
1. Carotid compression	1.97	2.63
2. Angular acceleration	2.28	2.76
3. Corneal stimulation	2.33	2.69
M. Spinal accessory-	3.01	2.93
1. Myofascial release	3.17	2.91
2. Therapeutic exercises	3.32	3.12

3. Manipulation	3.60	3.33
4. Slow/fast stretch	3.46	3.24
N. Hypoglossal-	2.36	2.66
1. Therapeutic exercises	2.63	2.76
Diagnostic issues	2.68	3.06
Eg. Distinguishing Horner's syndrome from cranial nerve disorder	2.45	3.23
Simple versus pathological anisocoria	2.59	3.25

Survey 14: Cognitive Area: Head and Face Pain

The purpose of this survey is to determine the frequency and importance of the cognitive information and treatment modalities used for patients with head and face pain.

1. Please rate the following functional Neuroanatomy in terms of importance and frequency of use in your practice.

Items	Frequency Weight	Importance Weight
A. Cranial bones, sutures, foramina	2.63	1.84
B. Potential sites of neural compression	3.06	2.03
C. Pain sensitive structures of the head	3.29	2.02
D. Upper cervical spinal cord anatomy	3.42	1.99
E. Location of cranial nerves and their nuclei	3.57	1.94
F. Neocortical and Paleocortical relationships	3.17	1.99
G. Relationships with deep cerebral nuclei and cerebellum	3.37	2.01
H. Vasculature	3.22	2.00

2. Please indicate the importance of knowledge about the following disorders and how frequently you see them in your practice and how those patients are managed.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Migraine	3.47	3.37	3.65
B. Cluster headache	2.76	3.09	3.36
C. Cervicogenic headache	3.63	3.29	3.93
D. Tension type headache	3.67	3.29	3.92
E. Temporal neuritis	1.93	3.16	2.01
F. Subarachnoid hemorrhage	1.56	3.52	0.99
G. Trigeminal neuralgia	2.33	3.22	2.99
H. Atypical facial pain	2.40	3.05	2.94
I. Temporo-mandibular joint pain	3.20	3.09	3.67

3. Please indicate how important the following rehabilitation principles are in terms of treating your patients and how frequently you use these principles.

Items	Frequency Weight	Importance Weight
1. Central vs Peripheral nerve lesions and limitations to regeneration	3.29	3.23
2. Cranial nerve sensory and motor relationships	3.41	3.30
3. Peripheral signaling into brainstem	3.52	3.26
4. Suprasegmental signaling into brainstem	3.57	3.31
5. Metabolic capacity	3.62	3.40
6. Central integrated state and potential for plastic change	3.64	3.41
7. To achieve great probability of CNS change:		
a. fast adapting receptors need to be stimulated with varying amplitudes or patterns	3.55	3.28
b. slowly adapting receptors will maintain a change in firing rate with a new, but constant stimulus	3.47	3.20
8. Receptors that fire frequently (slowly adapting or associated with a frequently changing system) and are very responsive to change (high sensitivity) often have the greatest CNS input; these are mostly proprioceptors and vestibular receptors	3.54	3.35

4. Please indicate how important the following rehabilitation applications are to your practice and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
1. Sympathetic inhibition	3.55	3.29
2. Mechanisms of nerve decompression	3.38	3.29
3. Oxygenation (decreased CO ₂)	3.47	3.40
4. Vestibular reflexes	3.57	3.40

5. Autonomic controls	3.47	3.33
6. Gait retraining	3.08	2.95
7. Brain based therapies	3.55	3.41
8. Crude touch, pain, temperature and accurate touch modalities	3.20	3.03
9. Chiropractic adjusting technique	3.80	3.55
10. Range of motion therapeutics (resistance training, stretch, muscle work)	3.72	3.30
11. Mental imagery	2.90	2.83
12. Desensitization	2.83	2.86
13. Sleep patterning	2.42	2.66
14. Breathing exercises	3.35	3.09

5. Please indicate how important the following diagnostic issues are and how frequently you use them in your practice. The chiropractic neurologist is skilled in:

Items	Frequency Weight	Importance Weight
A. History taking differentiating primary head pain lesions with secondary or sinister ones	3.33	3.58
B. Complete neurological examination with emphasis on: a. Cranial nerve testing	3.37	3.44
b. Autonomic assessment	3.45	3.44
c. Muscle spindle reflexes	3.58	3.36
d. Strength	3.57	3.36
e. Primitive reflexes	3.05	3.09
f. Assessment of tone	3.57	3.35
g. Tactile sensation testing	3.46	3.20
C. Use of diagnostic imaging	3.12	3.24
D. Differentiating between a single lesion, multiple lesions and systemic lesions	3.37	3.44

Survey 15: Cognitive Area: Cerebellum

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used with respect to the cerebellum.

1. Please indicate how important knowledge of the following functional Neuroanatomy is to the practice of chiropractic neurology and how frequently you use this information in your practice.

Items	Frequency Weight	Importance Weight
A. Deep cerebellar nuclei	3.42	3.30
1. Fastigial	3.46	3.32
2. Interpositus (Emboliform, Globus)	3.44	3.33
3. Dentate	3.48	3.33
B. Cortex Layers	3.15	3.15
1. Granular layer-granule, golgi cells	2.95	3.01
2. Purkinje layer-purkinje cells	3.20	3.14
3. Molecular layer-stellate & basket cells, parallel fibers	3.07	3.00
C. Pathways	3.49	3.35
1. Afferent Pathway	3.49	3.35
a. Mossy fiber	3.13	3.09
1) (destination: deep cerebellar nuclei & granular cells; originate from:	3.20	3.16
a) DSCT/VSCT (descending spinocerebellar tract, vestibulospinal tract)	NA	3.15
b) pontine reticular formation	3.43	3.29
b. Climbing fibers	3.33	3.27
1) Destination: deep cerebellar nuclei & purkinje cells	3.10	3.01
2) Originate from: inferior olive	3.20	3.20
3) Parallel fibers activated by climbing fibers in molecular layer:	3.09	3.04
4) Destination	2.96	2.95
5) Origination	3.05	3.09
c. Peduncles	3.09	3.07
1) Superior-brachium	2.92	2.97
	2.86	2.96

conjunctiva		
2) Red nucleus-parvocellular	3.15	3.11
3) Middle-brachium pontis	2.93	2.99
4) Red nucleus-magnocellular	3.09	3.09
5) Ventral lateral ventral anterior n. thalamus	3.09	3.07
6) Inferior-restiform body	2.88	2.94
7) Mossy-body	2.73	2.89
d. Cortex	3.40	3.23
1) Spinal Cord	3.50	3.30
2) Brain Stem	3.55	3.33
e. Efferent Pathway	3.57	3.34
1) Cortex	3.54	3.34
2) Spinal Cord	3.54	3.34
3) Brain stem	3.51	3.34
D. Functional Anatomy:	3.59	3.41
1. Cerebrocerebellum-lateral	3.46	3.33
2. Spinocerebellum-intermediate	3.48	3.31
3. Vestibulocerebellum-midline	3.51	3.33
E. Developmental functional anatomy	3.01	3.03
1. Neocerebellum	2.89	2.96
2. Paleocerebellum	2.88	2.95
3. Archeocerebellum	2.86	2.95

2. Please indicate how important knowledge of the following functional physiology is to the practice of chiropractic neurology and how frequently you use this information in your practice.

Items	Frequency Weight	Importance Weight
A. Feedback	3.45	3.30
1. Data of motoric activity that actually took place as measured by the various receptors that is sent back to CNS by afferent proprioceptive system via DSCT and SCT.	3.22	3.16
2. Sensory input into cerebellum	3.53	3.40
B. Feed forward	3.35	3.24
1. Data that is fed forward to the cortex by the dentate prior to and during execution of commands.	3.30	3.20

2. Input into cortex	3.46	3.30
C. Efferent copy (Defined: Brain relays copy of motoric commands to contralateral cerebellum via ipsi pontine reticular formation to be analyzed by contra cerebellum (comparing command versus actual expression that is taking place so that modulation can be implemented.))	3.32	3.29
D. Initiating	3.30	3.23
1. Movement	3.37	3.28
2. Thought	3.22	3.18
E. Cessation	3.28	3.19
1. Movement	3.41	3.27
F. Surround Inhibition-priming of basket and stellate active inhibition of purkinje system to allow ease of summation of deep cerebellar nuclei related to an expected summation as a consequence of carried out patterns of movement.	3.21	3.25

3. Please indicate how important knowledge of the following disease processes/diagnoses are to the practice of chiropractic neurology and how frequently you use this knowledge in your practice and how you manage patients with these issues.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Atrophy	2.89	3.24	2.77
B. Injury	3.06	3.30	2.82
C. Toxicity	2.65	3.21	2.22
D. Genetic diseases	2.37	3.07	1.89
E. Concomitant deafferentation	3.04	3.26	3.27
F. Pathway disease-spinocebellar	2.41	3.26	2.30
G. Tumor	1.96	3.31	1.18
H. Stroke	2.13	3.40	1.41
I. Ischemia	2.22	3.30	1.77
J. Location-tremor-symptoms	2.65	3.23	2.70

4. Please indicate how important the following rehabilitation principles are and how frequently you use these principles in your practice.

Items	Frequency Weight	Importance Weight
A. Location	3.47	3.27
1. Midline	3.50	3.33
2. Intermediate	3.39	3.25
3. Lateral	3.45	3.29
B. Sidedness	3.68	3.38
C. Metabolic indicators	3.37	3.26
E. Manifestation	3.34	3.13
1. Disdiadochokinesia	3.48	3.26
2. Dysmetria	3.54	3.30
3. Tremor	3.40	3.33
4. Balance	3.64	3.41
5. Speech	3.35	3.21
6. Bradykinesia	3.32	3.21
7. Limbic relationships	3.25	3.20
8. Vestibular interactions	3.60	3.35
a. Canal relationships/Angular acceleration	3.48	3.33
b. Otolithic relationships/Linear acceleration	3.37	3.31

5. Please indicate how important the following rehabilitation applications/treatment modalities are and how frequently you use these principles in your practice.

Items	Frequency Weight	Importance Weight
A. Cross-crawl	3.12	3.12
1. Bilateral	3.16	3.11
2. Ipsilateral	3.04	3.01
B. Finger-to-nose	3.45	3.25
C. Balance	3.64	3.38
1. Rhomberg	3.59	3.39
2. Tandem Gait	3.45	3.25
3. One leg standing	3.40	3.22
D. Finger to finger	3.32	3.17
1. Ipsilateral	3.28	3.15
2. Contralateral	3.34	3.15

3. Target shifting	3.16	3.04
4. Computerized target shifting	1.76	2.57
E. Rapid coordinated finger movements-Piano playing	3.41	3.13
F. Temperature gradient and modulated calorics	2.00	2.81
G. Novel and known faces	2.48	2.76
H. Alternating movements	3.37	3.17
I. Active passive/movement	3.52	3.13
J. Visualization	2.89	2.89
K. Vestibular integration	3.50	3.29
1. Linear/angular acceleration	3.16	3.13
2. Ocular activation	3.51	3.27
a. VOR	3.25	3.24
b. Pursuit/cicade targeting	3.49	3.31
L. Extremity temperature	2.36	2.65
M. Electrical modulation:	2.72	2.80
1. passive	2.81	2.83
2. active	2.56	2.77
N. Visualization activity	2.63	2.83

6. Please indicate how important the following diagnostic techniques/issues are to the chiropractic neurologist and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. Neurological exam	3.53	3.58
1. Extremity execution of coordinated movements	3.48	3.45
2. Core execution of coordinated movements	3.41	3.39
B. Differentiating tremors	3.00	3.21
1. Resting	3.08	3.23
2. Dystonic	2.89	3.23
3. Orthostatic	2.80	3.18
4. Essential	3.01	3.18
5. Intention	3.09	3.25
6 Parkinsonian	2.90	3.21
7. Physiologic	2.98	3.19
8. Rubral	2.51	3.08
C. Oculomotor abnormalities	3.38	3.31
1. Hypometria/hypermtria	3.35	3.34

2. Saccades\pursuits	3.42	3.33
3. Canal related movements	3.35	3.28
D. Frank pathology	2.35	3.30
1. Tumors	2.14	3.38
2. Genetic disease	2.23	3.13
3. Degenerative disease	2.99	3.30
4. Toxicities	2.49	3.18

7. Please indicate how important the following treatment issues are to the chiropractic neurologist and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. Supplementation	3.30	3.43
B. Fuel delivery	3.48	3.46
C. Metabolic stability	3.28	3.42
D. Modulation	3.30	3.27
E. Medical referral	2.66	3.13

Survey 16: Cognitive Area: Basal Ganglia

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used with respect to the basal ganglia.

1. Please indicate how important knowledge of the following functional anatomy/physiology is to the practice of chiropractic neurology and how frequently you use this in your practice.

Items	Frequency Weight	Importance Weight
A. Striatum/Neostriatum, used interchangeably	2.89	2.95
a. Caudate: concerned with emotion and head and face	2.96	3.06
b. Putamen: concerned with neck and below	2.99	3.09
c. Globus Pallidus: main inhibitory system and developmentally linked to Substantia Nigra	3.06	3.13
i. Globus Pallidus Externa (GPe)	2.98	3.06
ii. Globus Pallidus Interna (GPi)	3.00	3.08
B. Substantia Nigra	3.01	3.15
a. a. Substantia Nigra Pars Compacta (SNc)	2.94	3.09
b. b. Substantia Nigra Pars Reticulata (SNr)	2.95	3.08
C. Subthalamic Nucleus (STN)	2.86	3.01
D. Direct Pathway: multiple brain areas, primary premotor frontal areas, fire to	3.11	3.14
a. Excite Neostriatum, which fires to inhibit GPi, which inhibits thalamic nuclei that	3.13	3.13
b. Excite frontal motor areas: excitation of inhibition of inhibition results allows for	3.14	3.14
c. Thalamic excitation of frontal motor areas.	3.17	3.11
E. Indirect Pathway: multiple brain areas excite neostriatum which fires to inhibit	3.09	3.11

a. GPe's inhibition of STN's excitation of GPi: excitation of inhibition of inhibition of	3.10	3.10
b. Excitation of inhibition ultimately results in inhibition of motoric output.	3.14	3.12
F. Functional output is not always direct or indirect, i.e., indirect pathway may	3.03	3.09
a. Inhibit motoric output that is antagonistic to excitation of an action that will	3.04	3.09
b. Contradict a movement that will result in instability.	3.01	3.09
G. Substantia Nigra (Mesencephalon)	3.13	3.16
a. Reticulata: functions similarly to the pallidum	2.91	3.06
b. Compacta: neurotransmitter dopamine to the neostriatum	3.09	3.15
i. D1 receptors in Direct Pathway are excitatory	2.88	3.08
ii. D2 receptors in Indirect Pathway are inhibitory	2.90	3.08
H. Limbic Component	2.94	3.08
a. Nucleus accumbens (NA)	2.71	2.97
b. Ventral pallidum	2.71	2.99
c. Ventral tegmental area (VTA): VTA efferents provide dopamine to NA in	2.88	3.04
d. Reward learning.	2.82	2.99

2. Please indicate how important knowledge of the following disease processes/diagnoses is to the practice of chiropractic neurology and how frequently you use this knowledge in your practice and how you manage patients with these issues.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Movement Disorders	2.86	3.33	2.95
a. Parkinson's Disease: loss of SNc dopamine to neostriatum	2.56	3.26	2.43

b. Huntington's disease: damage to neostriatum	1.43	3.09	1.88
c. Ballismus: STN damage	1.35	3.05	2.01
d. Tourette's syndrome: lack of inhibition of pathways resulting in motor tics and at least one phonic tic.	1.95	3.15	2.78
e. Obsessive-Compulsive disease: dopaminergic hyperfunction in the prefrontal cortex and serotonergic hypofunction in the basal ganglia.	2.35	3.17	2.75
f. Dystonia: increased and sustained output of motoric centers; begins focally and spreads unilaterally and then bilaterally.	2.37	3.17	2.96
g. Wilson's Disease: hepatolenticular degeneration (copper metabolism)	1.30	3.06	1.55

3. Please indicate how important the following rehabilitation principles/treatment modalities are and how frequently you use these principles in your practice.

Items	Frequency Weight	Importance Weight
A. CIS assessment of component nuclei	3.16	3.20
B. Activation of appropriate nuclei:	3.28	3.22
a. Frontal mechanisms to activate striatum	3.22	3.16

b. Mesencephalic activation to activate frontal lobe	3.29	3.25
c. Mesencephalic inhibition to limit active pathway and frontal lobe	3.22	3.26
d. Cerebellum activation or inhibition depending upon state of contralateral mesencephalon	3.33	3.29
e. Cerebellum mossy fiber or climbing fiber activation for increased surround inhibition or for purkinje inhibition	3.14	3.25
C. Measurement of metabolic capacity	3.38	3.29
a. ANS:	3.41	3.36
i. SpO2	3.38	3.30
ii. Heart rate	3.61	3.36
iii. Respiratory rate, quality & depth	3.54	3.29
iv. Skin color,	3.49	3.19
v. Capillary filling,	3.24	3.21
vi. Skin temperature.	2.94	3.09
b. Measurement of component tissue cis, with example of mesencephalon:	3.25	3.17
i. Pupillary response,	3.58	3.36
ii. CN III	3.58	3.37
1) Ipsilateral medius rectus	3.54	3.33
2) Inferior rectus	3.52	3.32
3) Inferior oblique	3.53	3.32
4) Ipsilateral superior rectus	3.53	3.32
5) Contralateral superior rectus	3.44	3.29
iii. Contralateral limb flexors, ocular convergence, bilateral activation of sympathetic pathway.	3.37	3.32

4. Please indicate how important the following diagnostic issues are to the chiropractic neurologist and how frequently you use them in your practice. The chiropractic neurologist is skilled in:

Items	Frequency Weight	Importance Weight
A. History taking differentiating central/basal ganglionic lesions from peripheral lesions.	3.28	3.45
a. History of areas of function	3.39	3.42
i. Motoric function	3.41	3.43
ii. Frontal related function:	3.47	3.36
1) right and left executive control,	3.46	3.33
2) Trouble with saccade function,	3.49	3.39
3) Hypertonia	3.48	3.36
4) Posture of pyramidal paresis	3.54	3.36
iii. Cerebellum related function:	3.64	3.49
1) Balance	3.62	3.46
2) Coordination	3.61	3.46
3) Dizziness (spin,etc)	3.56	3.43
4) Eye control problems	3.48	3.40
5) Repetitive sprain/strains	3.61	3.36
6) Hypotonia	3.46	3.34
iv. Mesencephalon:	3.49	3.37
1) Trouble with light	3.42	3.34
2. Heart rate (may be perceived as panic attacks)	3.37	3.25
3) Visual problems	3.30	3.20
4) Sleep problems	3.42	3.19
5) Decreased energy	3.54	3.29
6) Gut trouble	3.53	3.30
7) Activated by inflammatory immune cytokine receptors.	3.13	3.18
v. Emotion and control or physical output secondary to emotion (caudate/limbic).	3.18	3.20
B. Complete neurological examination with emphasis on:	3.45	3.41
a. Frontal output:	3.35	3.30
i. Saccades	3.52	3.36
ii. Vertical optokinetics	3.45	3.34
iii. Monotone and melodic sequencing	2.89	3.09
iv. Analytic capability	2.94	3.15

v. Understanding humor.	2.95	3.13
b. Cerebellum	3.59	3.46
c. Mesencephalon	3.48	3.41
d. Thalamus:	3.32	3.23
i. Perception right vs. left vision	3.20	3.19
ii. Sound	3.21	3.13
iii. Touch modalities.	3.45	3.28
e. Autonomic Nervous System	3.51	3.39
f. Heart, Lungs, Abdomen	3.29	3.26
g. Posture:	3.61	3.39
i. Pyramidal paresis	3.54	3.39
ii. Flexor tone	3.53	3.35
iii. Hemiparesis	3.25	3.38

Survey 17: Cognitive Area: Reflexogenic Systems

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used to assist patients with reflexogenic symptoms.

1. Please indicate how important knowledge of the following functional anatomy/physiology is to the practice of chiropractic neurology and how frequently you use this in your practice.

Items	Frequency Weight	Importance Weight
Monosynaptic reflex-(MSR)(DTR)-muscle spindle (1a)-ventral horn cell	3.65	3.34
Disynaptic reflex-muscle spindle(1A)-1A interneuron-antagonist ventral horn cell	3.58	3.27
Multisynaptic reflex-suprasegmental control, modulation, of ventral horn cell	3.53	3.25
Pyramidal system-corticospinal, corticobulbar	3.58	3.30
Extrapyramidal system-basal ganglia, nigrostriatal, cerebellum, vestibular	3.59	3.32
Rubrospinal	3.28	3.18
Reticular formation	3.46	3.23
Medial	3.31	3.13
lateral	3.34	3.14
Vestibulospinal	3.57	3.33
Medial	3.42	3.21
Lateral	3.43	3.22
Tectal spinal	3.23	3.09
Superior collicular	3.36	3.15
Inferior collicular	3.32	3.11
Disease	3.13	3.33
1. Tumor	2.24	3.31
2. Vasculature-obstruction/tone modulation	2.53	3.34
a. Stroke	2.46	3.47
b. TIA	2.45	3.37
c. Aneurism	2.06	3.40

3. Deafferentation	3.23	3.31
4. Genetic disease	2.24	3.10
5. Toxicity	2.68	3.18
6. Hemisphericity	3.56	3.41

Survey 18: Cognitive Area: Autonomic Nervous System

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used related to the autonomic nervous system.

1. Please rate the following functional Neuroanatomy according to its importance to your practice and the frequency you use it in your practice.

Items	Frequency Weight	Importance Weight
A. Most rostral portion the hypothalamus with sympathetic and parasympathetic divisions	2.96	3.03
a. Sympathetic: fight or flight	3.49	3.23
1) increases hr, dilates pupils (10% control of size)		
2) Sweat stimulated, blood diverted from GI tract to skeletal muscles	3.26	3.19
3) Sphincters of alimentary tract are closed.	2.79	2.95
b. Parasympathetic: viewing, constricts pupils (90%	3.43	3.24
1) Adapts the eyes for close up control of size),	3.38	3.16
2) slows heart rate	3.38	3.16
3) promotes secretion of salivary and intestinal juices	3.38	3.16
4) accelerates intestinal peristalsis.	3.23	3.15
c. Sympathetic and parasympathetic combined in sexual intercourse.	2.67	2.94
B. Sympathetic & Parasympathetic	3.42	3.17
a. Controlling fibers in hypothalamus and brainstem send central fibers to synapse upon the preganglionic fibers in the bs and spinal cord (IML).	3.32	3.23

b. From IML, preganglionic neurons project out of CNS to synapse upon neurons in autonomic ganglia.	3.30	3.16
c. Unmyelinated postganglionic fibers emerge and form terminal networks in target tissues.	2.97	2.92
C. Sympathetic post ganglionic fibers synapse:	3.17	3.01
a. Nearest ganglion to accompany spinal nerves and supply sweat and vessels.	3.06	3.04
b. Ascend to synapse in superior, middle, or stellate ganglion (fusion of inferior and first thoracic ganglia) and post ganglionic fibers supply head, neck, upper limbs and heart.	3.09	3.09
c. Descend to synapse in lumbar or sacral ganglia and post ganglionic fibers enter lumbosacral plexus for blood vessels and skin of lower limbs.	3.11	3.05
D. Parasympathetic post ganglionic fibers	3.14	3.06
a. Cranial PS System: pregang fibers emerge in four cranial nerves to synapse on:	3.17	3.10
1) In CN III to ciliary gang: post gang fibers to sphincter of pupil and ciliary	3.35	3.19
2) Muscle (accommodation reflex).	3.45	3.18
3) In CN VII to pterygopalatine ganglion:	3.08	3.00
i) lacrimal and nasal glands;	3.08	3.00
ii) In CN VII to submandibular gang to submandibular and sublingual glands.	3.14	2.97
3) In CN IX to otic gang: parotid gland.	3.00	2.94

4) In CN X to mural or intramural:	3.19	3.14
i) to heart, lungs, lower esophagus, stomach, pancreas, gall bladder, small intestine	3.19	3.08
ii) Ascending and transverse parts of colon	3.01	3.04
E. Neurotransmission	3.09	3.10
a. Sympathetic preganglionic: ACh	3.00	2.94
b. Parasympathetic pregang: ACh	2.96	2.93
c. Symp postgang: norepinephrine (except sweat = Ach)	2.95	2.91
d. PS postgang: ACh	2.95	2.90

2. Please rate the following disorders according to the importance of being able to diagnose them and how frequently you see them in your practice and how you manage patients with these issues.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Sympathetic Escape (decreased pontine control)	3.24	3.32	3.60
1. End organ effect: i.e., tachycardia on right and arythmia on left	2.94	3.31	2.65
2. 2End organ effect: i.e., intestinal hypofunction	3.01	3.23	3.16
B. Reynaud's phenomenon	2.42	3.10	3.24
C. Complex Regional Pain Syndrome	2.35	3.16	3.10
D. Sympathetic aggravation of immune response (asthma)	2.88	3.19	2.86
E. Horner's syndrome	1.88	3.20	2.22

3. Please rate the following rehabilitation principles as to their importance in your practice and the frequency that you use them with your patients.

Items	Frequency Weight	Importance Weight
A. Pontine inhibition of sympathetics	3.31	3.28
B. Frontal activation of pontine centers	3.35	3.26
C. Limbic activation of hypothalamus	3.03	3.16
D. Adrenal activation of sympathetics	3.11	3.15
E. Measurement of metabolic rate:	3.56	3.41
1. Pulse oxymetry	3.60	3.31
2. Heart rate	3.66	3.38
3. Pupillary response	3.68	3.36
4. Respiratory rate	3.40	3.24
5. Erector pilar	2.79	2.85
6. Muscle activation	3.60	3.24
7. Skin color	3.46	3.16

4. How important are the following diagnostic issues to your practice and how frequently do you use each in your practice?

Items	Frequency Weight	Importance Weight
A. History taking including lifestyle factors	3.64	3.53
B. Complete neurological examination with emphasis on:	3.57	3.51
a. Pupillary response	3.68	3.44
b. Corneal reflex (pontine cis)	3.43	3.31
c. Heart rate	3.64	3.35
d. SpO2	3.46	3.33
e. Skin color	3.48	3.25
f. Capillary filling	3.31	3.20
g. Limbic changes to above (such as emotional testimony)	3.31	3.16
h. Gut function	3.51	3.23

i. Adrenal function (lab testing or ability to sleep through night)	3.10	3.19
j. ALL cranial nerves	3.48	3.40

Survey 19: Cognitive Area: Limbic Area

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used related to the limbic system.

1. Please indicate how important knowledge of the following functional anatomy is to the practice of chiropractic neurology and how frequently you use this in your practice with respect to the limbic system.

Items	Frequency Weight	Importance Weight
A. Brainstem	3.52	3.39
1. Ventral tegmentum	3.20	3.18
2. Reticular formation	3.35	3.28
3. Locus coeruleus	3.01	3.14
4. Lateral dorsal tegmental nucleus	2.82	3.00
5. Pedunculopontine nucleus	2.70	2.99
B. Deep brain structures	3.32	3.23
1. Amygdala	3.15	3.23
2. Hippocampus	3.16	3.15
3. Nucleus accumbens	2.87	3.06
4. Parahippocampus	2.75	2.99
5. Subiculum	2.49	2.82
6. Perirhinal cortex	2.59	2.92
7. Hypothalamus	3.20	3.23
8. Entorhinal cortex	2.61	2.86
9. Cingulate gyrus	3.05	3.09
10. Septal nuclei	2.51	2.86

2. Please indicate how important knowledge of the following disease processes/diagnoses are to the practice of chiropractic neurology and how frequently you use this knowledge in your practice and how you manage these issues with your patients with limbic symptoms.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Mania	2.30	2.04	1.73
B. Depression	3.13	2.13	1.91
C. Hyper sexuality	1.66	1.90	1.61
D. Hypo-sexuality	2.35	1.91	1.75
E. Spirituality hyper/hypo	1.96	1.83	1.53

F. Hallucinations	1.79	1.92	1.58
1. Auditory	1.95	1.91	1.68
2. Olfactory	1.92	1.92	1.59
3. Gustatory primarily, however can be of any sense modality	1.86	1.96	1.64
G. Anxiety	3.25	2.00	1.89
H. Autonomic dysregulation/autonomia	3.18	2.00	1.65
I. Emotional manifestations or lack of:	3.01	2.01	1.64
1. Right hemisphere - sadness, fear, disgust	3.06	2.04	1.63
2. Left hemisphere - euphoria, anger, excessive surprise, unwarranted bliss	2.99	2.05	1.59
J. Epilepsy	2.14	2.00	1.75
K. Cancer	2.08	1.87	1.13
L. Tumor	1.95	1.94	1.13
M. AVM	1.71	1.88	1.01
N. Microvascular disease	2.15	2.00	1.47
O. Atrophy (in limbic area or cortex affecting inhibition of limbic output)	2.13	2.04	1.61
P. Parkinson's	2.36	2.08	1.90
Q. Alzheimer's	2.03	2.11	1.71
R. Neurodegenerative disorders	2.53	1.90	1.86
S. Developmental disorders	2.56	1.90	1.68
T. Stroke	2.22	1.91	1.66
U. Dysautonomia	2.51	1.94	1.74

3. Please indicate how important the following rehabilitation principles/treatment modalities are to your practice and how frequently you use these principles in your practice.

Items	Frequency Weight	Importance Weight
A. sidedness	3.49	3.38
B. metabolic indicators	3.45	3.40
C. sensory stimulation	3.61	3.34
1. Light	3.40	3.28
a. Quadrant specific stimulation	2.96	3.18
b. Light frequencies-colors	3.01	3.09

c. Intensity	3.04	3.11
d. Quality	3.04	3.09
1) Bars	2.58	3.01
2) OPK	3.52	3.27
3) Still/movement	3.15	3.09
2. Sound	3.23	3.12
a. Localization	2.78	3.00
b. Pitch	2.68	2.91
c. Music	2.95	3.04
1) Hemisphere specific	3.29	3.28
2) Emotion specific	2.65	3.00
3) Rhythm	2.94	3.05
4) Tempo	2.94	3.08
3. olfaction	2.87	3.05
a. Pleasant versus non-pleasant	2.38	2.92
b. Olfactory localization	2.26	2.84
c. Olfactory identification	2.72	2.96
4. Touch	3.49	3.20
a. Vibration	3.43	3.23
b. Localization	3.23	3.14
c. Pressure	3.13	3.09
d. Pain/pleasure	3.08	3.09
5. Gustatory	2.34	2.83
a. Bitter	2.12	2.79
b. Sweet	2.13	2.79
c. Sour	2.12	2.74
D. Connotation of a paragraph for right hemisphere. (interpretive meaning)	2.29	2.88
E. Enteroception concentration (focus on body part or system) for right hemisphere.	2.40	2.95
F. Vocalization of text for left hemisphere.	2.61	2.99
G. Spatial awareness for right hemisphere.	2.90	3.06
H. Mathematical calculations for left hemisphere	2.99	3.08
G. Spatial awareness and manipulation right hemisphere	3.03	3.11

4. Please indicate how important the following diagnostic issues are to the chiropractic neurologist and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. Neurological exam	3.63	3.60
1. Evaluation of emotional expression and manifestation	3.24	3.12
a. Responses to humor	3.18	2.97
b. Responses to pain	3.41	3.16
c. Responses to suffering	3.01	3.01
d. Responses to joy	2.89	2.97
e. Responses out of context	3.08	3.04
f. Responses to sadness	2.94	2.97
2. Sexual preferences	2.01	2.32
a. Drives	2.36	2.72
b. Frequency	2.14	2.62
c. Ability	2.47	2.79
1) Erection	2.55	2.82
2) Lubrication	2.38	2.79
3) Arousal	2.26	2.78
4) Orgasm	2.18	2.67
3. Relationship tactics	2.39	2.51
a. Aggressive	2.37	2.62
b. Submissive	2.35	2.58
c. Argumintaitive	2.33	2.61
d. Perspective	2.37	2.64
e. Optimistic/pessimistic	2.53	2.70
f. Complimentary	2.42	2.65
g. Length of relationships	2.40	2.53
4. Autonomic	3.27	3.13
a. Anxiety	3.28	3.14
b. Bowel regularity	3.40	3.19
c. Bladder regularity	3.40	3.14
d. Blood pressure	3.48	3.25
e. Heart rate	3.52	3.27
f. Sweating	3.33	3.15
g. Extremity temperatures	2.94	2.94
h. Emotional effects of autonomies	2.78	2.96
5. Reflexes	3.50	3.18
6. Blind spots	2.64	2.90

B. Spiritual beliefs	1.95	2.34
1. Percentage of time dedicated to religious activities	1.90	2.32
2. Hallucinations	2.04	2.90
a. Visual	2.19	2.94
b. Auditory	2.21	2.95
c. Somatosensory	2.49	3.01
d. Olfactory	2.23	2.91
e. Gustatory	2.06	2.82
3. Altruism	1.90	2.40
4. Charity	1.90	2.45
5. Selfishness	1.96	2.42
6. Introversion/extroversion	2.28	2.65

5. Please indicate how important these diagnostic testing modalities are to the chiropractic neurologist and how frequently you use them in your practice with patients with limbic symptoms.

Items	Frequency Weight	Importance Weight
A. MRI	2.79	3.39
B. MRa	1.85	3.32
C. EEG	1.79	3.29
D. Referral-specific	2.42	3.26

Survey 20: Cognitive Area: Lobes of the Brain

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used related to the lobes of the brain.

1. Please indicate how important the following functional Neuroanatomy is to the practice of chiropractic neurology and how frequently you use this knowledge in your practice:

Items	Frequency Weight	Importance Weight
A. Gross anatomy and relationship with cranial structures	3.51	3.37
B. Main anatomic areas for each Lobe	3.45	3.35
a. Frontal	3.53	3.42
i. Gyri- precentral, superior, paracentral, cingulate, middle, inferior	3.27	3.16
b. Parietal	3.57	3.36
i. postcentral, superior, inferiGyror (angular, supramarginal), paracentral, precuneus, cingulate	3.23	3.15
c. Occipital	3.48	3.30
i. Cuneus, lingual, lateral	3.08	3.08
d. Temporal	3.49	3.30
i. Superior, middle, inferior, lingual, parahippocampal	3.08	3.09
e. Insula	2.97	3.10
f. Additional landmarks- saggital sulcus, central sulcus, sylvian fissure, parieto-occipital sulcus, calcarine fissure, temporal-occipital notch, uncus of the temporal lobe, frontal/temporal/occipital pole	2.95	3.01
C. Generalized functional designations for neocortex	3.32	3.21
a. Paleo-neocortex	3.15	3.13
b. Neo-neocortex	3.23	3.16
D. Functional areas of the frontal lobe	3.49	3.34
a. Motor, premotor, prefrontal	3.49	3.34

E. Six layers of human cerebral cortex	2.64	2.91
F. Localization of primary sensory and motor functions	3.43	3.24
G. Relationships with deep nuclei, brainstem, spinal cord and cerebellum	3.40	3.33

2. Please indicate how important knowledge about the following disorders is to the practice of chiropractic neurology and how frequently you use this in your practice:

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Functional categories	3.51	3.31	3.76
a. Attentional	3.31	3.24	3.66
b. Emotional	3.24	3.26	3.34
c. Memory	3.34	3.25	3.40
d. Sensory	3.51	3.29	3.66
e. Sensorimotor integration & Movement Execution	3.48	3.35	3.70
f. Interhemispheric disconnection	2.96	3.18	3.22
g. Dementia	2.51	3.23	2.43
B. Anatomic categories	3.30	3.18	3.33
a. Occipital	3.19	3.24	3.26
b. Temporal	3.23	3.29	3.34
c. Parietal	3.32	3.32	3.38
d. Frontal	3.34	3.34	3.35
e. Callosal	2.69	3.21	3.14
C. Terminology of Symptoms-	3.26	3.10	3.37
a. Neglect	2.45	3.19	3.05
b. Akinesia	2.64	3.15	2.94
c. Perseveration	2.83	3.20	3.10
d. Echolalia	2.16	3.09	2.84
e. Akinetic	2.51	3.14	2.90
f. Hallucinations	2.04	3.04	2.29
g. Agnosia	2.26	3.08	2.66
h. Alexia	2.21	3.08	2.80

i. Dysgraphia	2.31	3.05	3.03
j. Aphasia	2.33	3.06	2.75
k. Anomia	2.21	3.04	2.76
l. Apraxia	2.61	3.09	2.92
m. Acalculia	2.10	2.97	2.87
n. Palsy	2.53	3.15	2.85
o. Hemianopia	2.04	3.18	2.48

3. Please indicate how important the following rehabilitation principles are in treating issues involving the lobes of the brain and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
1. Functional vs Pathological lesions	3.48	3.68
2. Left-right relationships	3.60	3.60
3. Ascending and descending relationships	3.58	3.51
4. Metabolic capacity	3.60	3.57
5. Central integrated state and potential for plastic change	3.67	3.57
6. Central changes associated with correction of joint biomechanics	3.72	3.58
7. Frequency, intensity and durations factors in promoting central plasticity	3.69	3.56

4. Please indicate how important the following rehabilitation applications are in treating issues involving the lobes of the brain and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
1. Right-left hemisphere relationships with joint mechanoreceptor activity	3.67	3.57
2. Local brain functions as rehabilitation	3.53	3.42
3. Visual stimulation	3.44	3.26
a. General	3.46	3.20
i. Hemifield glasses	2.56	3.04
ii. Eyclights	2.51	2.94
b. Right brain	3.59	3.34

c. Left brain	3.61	3.31
4. Auditory stimulation	3.16	3.11
a. Right Brain	3.36	3.19
i. Novel faces or other stimuli	2.85	2.99
ii. Nature pictures, sounds, etc.	2.70	2.96
iii. Poetry via audio	1.87	2.58
b. Left brain	3.31	3.20
i. Familiar	2.74	2.99
ii. Strong beat	2.44	2.80
iii. Prose via audio	1.92	2.61
5. Olfactory stimulation	2.84	3.08
6. Gustatory stimulation	2.03	2.82
7. Tactile stimulation	3.44	3.23
a. Vibration	3.52	3.28
b. Light touch	3.34	3.14
c. Textures	2.63	2.94
d. Eyes closed identification	2.81	2.96
8. Cognitive activation	3.28	3.16
a. Right brain	3.42	3.22
i. Mazes	2.75	2.99
ii. Spatial tasks	2.90	3.01
iii. Novel faces	2.60	2.92
b. Left brain	3.46	3.22
i. Word problems/games	2.94	3.05
ii. Sequencing activities	2.90	3.01
iii. Planning activities	2.76	2.93
9. Vestibular activity	3.50	3.38
10. Categorizing, sequencing	2.68	2.91
11. Decision making	2.77	2.96
12. Spatial relationships	2.86	3.08
13. Memory	2.99	3.01
14. Accurate touch	2.93	3.08

5. Please indicate how important the following diagnostic issues are for the practice of chiropractic neurology with respect to the lobes of the brain and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. History taking differentiating hemispheric lesions from lesions elsewhere	3.51	3.57
B. Complete neurological examination with emphasis on:	3.56	3.59
a. Hemispheric localization	3.53	3.46
b. Cognitive functions	3.48	3.38
c. Primary and secondary sensory and motor functions	3.54	3.35
d. Related "lower/reflexive" functions	3.36	3.21
C. Localization of lesions go specific or grouped by gyri	2.95	3.13
D. Differentiating between a single lesion, multiple lesions and systemic lesions	3.45	3.42
E. Use of Broadman's taxonomy.	2.48	2.63

Survey 21: Cognitive Area: Brain and Its Environment

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used relative to the brain and its environment.

1. Please indicate how important knowledge of the following functional anatomy is to the practice of chiropractic neurology and how frequently you use this in your practice.

Items	Frequency Weight	Importance Weight
I. Brain	3.78	3.57
A. Brain:	3.75	3.50
1. Develops embryologically from neuroectodermal tube (adult ventricles)	2.73	2.87
2. Medial surfaces of the diencephalon form the walls of the 3rd ventricle	2.46	2.84
3. 3rd ventricle:	2.66	2.88
a. Opens into lateral ventricles thru interventricular foramen of Monro	2.48	2.80
b. Continuous posteriorly with cerebral aqueduct of Sylvius	2.51	2.83
c. Continuous with the 4th ventricle (pons and medulla)	2.58	2.86
4. 4th ventricle:	2.69	2.86
a. Continuous with central canal of the caudal medulla and spinal cord	2.58	2.91
B. Four sulci:	2.74	2.90
1. Central	2.61	2.87
2. Lateral	2.59	2.86
3. Parietooccipital	2.60	2.86
4. Calcarine	2.60	2.87
C. Four lobes:	3.47	3.30
1. Frontal	3.49	3.30
2. Parietal	3.52	3.32
3. Temporal	3.48	3.32
4. Occipital	3.51	3.29

D. Insula: overlies site where telencephalon and diencephalon fused during embryological development	2.56	2.90
II. Environment	3.17	3.15
A. Meninges	2.95	3.08
1. Epidural space	2.78	2.96
2. Dura Mater	2.84	2.96
3. Arachnoid Mater	2.71	2.91
4. Pia Mater	2.65	2.90
5. Subdural space	2.81	2.94
6. CSF	2.90	3.10
7. Blood brain barrier.	3.14	3.22
B. Dural venous sinuses:	2.59	2.79
1. Superior sagittal sinus transverse sinuses	2.38	2.73
2. Several smaller sinuses	2.25	2.72
a. Inferior sagittal sinus	2.23	2.67
b. Occipital sinus	2.23	2.67
c. Inferior sinus	2.25	2.64
d. Superior petrosal sinuses.	2.25	2.68
C. Dural vasculature and innervation:	2.60	2.90
1. Maxillary artery	2.36	2.83
2. Middle meningeal artery	2.49	2.94
3. Ophthalmic artery	2.86	3.03
4. Occipital artery	2.64	2.99
5. Vertebral arteries	3.18	3.29
6. Primary sensory innervation	3.21	3.21
7. Sensory innervation of the posterior fossa of the dura	2.71	2.92
D. Cerebrospinal Fluid: Formed by filtration of blood through the fenestrations of the choroidal capillaries that circulates through the ventricles of the brain.	2.57	2.96
E. Blood Supply of Brain:	3.11	3.33
1. Arterial Internal carotid system:	3.03	3.28
a. Internal carotid artery pathway and bifurcation	2.92	3.28
2. Posterior communicating artery	2.65	3.09
3. Anterior choroidal artery	2.54	3.00
4. Anterior Cerebral Artery	2.88	3.14

a. Branches	2.69	3.10
b. Supply frontal & parietal lobe	2.78	3.17
c. Occlusion-restricted contralateral motor and somatosensory deficits	2.72	3.22
5. Middle Cerebral Artery	2.84	3.24
a. Large	2.74	3.18
b. Many branches	2.62	3.09
c. Supplies deep brain structures	2.69	3.10
d. Lenticulostriate arteries.	2.62	3.05
1) Ganglionic or penetrating branches collect anterior to the base of the brain and are called the anterior and posterior perforated substances.	2.43	2.99
2) Frequently involved in strokes.	2.72	3.26
3) Small damage to these arteries can equal disproportionate damage	2.62	3.22
6. Vertebral Basilar system:	2.97	3.32
a. Pathway	2.86	3.21
b. Branches	2.82	3.17
1) Posterior spinal artery	2.63	3.19
2) Anterior spinal artery	2.63	3.14
3) Posterior inferior cerebellar artery	2.84	3.23
7. Basilar Artery	2.78	3.24
a. Pathway	2.77	3.18
b. Supplies	2.74	3.24
1) Anterior Inferior Cerebellar Artery	2.75	3.21
a) Supplies inferior surface cerebellum (flocculus)	2.71	3.13
b) Supplies parts of pons	2.80	3.19
c) Supplies Internal Auditory Artery-occlusion can give rise to vertigo and ipsilateral deafness	2.71	3.19
2) Superior Cerebellar Artery	2.73	3.13
a) Supplies superior surface of cerebellum	2.69	3.12

b) Supplies caudal brain	2.69	3.09
c) Supplies rostral pons	2.66	3.09
3) Unnamed Branches	2.32	2.87
a) Supply Pontine arteries	2.60	3.06
b) Supply remainder of the pons	2.60	3.06
8. Posterior Cerebral Artery	2.75	3.12
a. Pathway	2.62	3.08
b. Supplies the medial and inferior surfaces of the occipital and temporal lobes.	2.73	3.08
c. Gives rise to the Posterior Choroidal Arteries	2.51	2.92
1) Supply the choroid plexus of the third ventricle	2.52	2.95
2) Supply body of the lateral ventricle.	2.55	2.99
3) Occlusion of a posterior cerebral artery at its origin leads to visual field losses.	2.56	3.10
9. Circle of Willis:	2.80	3.21
a. Composition	2.69	3.10
b. Result of occlusion	2.67	3.19
1) Venous Drainage	2.57	2.96
2) Superficial groups	2.45	2.88
a) Pathway	2.49	2.85
b) Drainage	2.41	2.85
c. Deep groups	2.43	2.83
1) Initial drainage	2.40	2.77
2) Drainage into straight sinus	2.42	2.76
d. Basal vein	2.44	2.80
1) Drains some deep structures	2.38	2.77
2) Empties into the straight sinus.	2.39	2.76

2. Please indicate how important knowledge of the following disease processes/diagnoses is to the practice of chiropractic neurology and how frequently you use this knowledge in your practice and how you manage these issues with your patients.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
1. Stroke	2.17	3.64	1.54
2. Transient ischemic attacks	2.23	3.53	1.95
a. Hard lesion (clot)	1.85	3.60	1.23
b. Physiological lesion	3.14	3.57	3.11
3. Aneurysms	1.78	3.51	1.25
4. Arteriovenous malformations	1.63	3.41	1.24
5. Meningitis	1.51	3.53	1.04
6. Encephalitis	1.43	3.53	1.00
7. Leakage of CSF	1.38	3.48	1.00
8. Increased intracranial pressure	1.64	3.53	1.04
9. Cavernous sinus syndrome/thrombosis	1.33	3.42	1.04

3. Please indicate how important the following diagnostic issues are to the chiropractic neurologist and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
1. Special Studies for Diagnosis (referred):	2.49	3.35
a. CT angiography;	1.65	3.23
b. MRI/MRA of brain	2.23	3.35
c. Lumbar puncture	1.26	3.05
2. Complete neurological examination by clinician.	3.23	3.52
3. Emergent vascular accident-get transport to ED	1.25	3.53
4. Discriminate between occlusive transient ischemia and physiologic ischemia	1.94	3.54

4. Please indicate how important the following rehabilitation principles/treatment modalities are and how frequently you use these principles in your practice.

Items	Frequency Weight	Importance Weight
1. Post emergent rehabilitation	2.31	3.32
a. Examine after stabilization	2.62	3.35
b. Treat with functional neurology	3.31	3.62
c. Patient education to recognize additional similar incidents or risks	2.96	3.57

Survey 22: Cognitive Area: Neuroendocrine System

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used related to the Neuroendocrine system.

1. Please indicate how important the following functional Neuroanatomy is to the practice of chiropractic neurology and how frequently you use this knowledge in your practice.

Items	Frequency Weight	Importance Weight
A. Neuroendocrine cells	2.97	3.08
a. Endocrine system	2.97	3.08
b. Nervous system	3.46	3.31
c. Hypothalamic/pituitary portal system	2.89	3.01
B. Hypothalamus	3.10	3.08
a. Supraoptic and paraventricular nuclei	2.55	2.86
C. Pituitary Gland	2.91	3.05
a. Anterior pituitary (adenohypophysis)	2.70	2.91
i. Rathke' pouch	2.70	2.91
ii. Blood supply	2.39	2.84
(a) Superior hypophysial arteries	2.39	2.84
(b) Internal carotid arteries	2.82	3.04
b. Posterior pituitary (neurohypophysis)	2.38	2.83
i. Pituitary stalk	2.38	2.83
D. Other structures information and relationships between the hypothalamus and pituitary:		
i. Infundibulum	2.41	2.79
ii. Median eminence	2.05	2.65
iii. Tuber cinerium	2.07	2.69
iv. Sella turcica	2.35	2.77
v. Blood brain barrier	2.96	2.96
vi. Mammillary bodies	2.26	2.76

2. Please indicate how important knowledge about the following disorders is to the practice of chiropractic neurology and how frequently you use this in your practice and how you manage these disorders.

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
A. Hyperprolactinemia	1.16	2.55	1.06
a. Associated conditions	1.43	2.49	1.08
i. Hypogonadism	1.20	2.62	1.08
ii. Amenorrhea	1.92	2.71	1.49
iii. iGalactorrhea	1.09	2.60	1.10
b. Disease states	1.87	2.69	1.07
i. Pituitary tumors	1.34	2.75	1.01
a) Prolactinomas	1.08	2.68	1.03
b) Adenomas secreting GH and prolactin	1.08	2.68	0.99
c) Adenomas secreting ACTH and prolactin (Cushing's disease)	1.20	2.74	1.07
d) Nonfunctioning chromophobe adenomas compressing pituitary stalk	1.01	2.69	0.96
ii. Hypothalamus	1.81	2.80	1.19
a) Sarcoidosis	1.33	2.75	1.00
b) Craniopharyngiomas	0.99	2.68	0.82
c) Cranial irradiation	1.20	2.68	0.89
d) Empty sella syndrome	0.92	2.66	0.79
e) Aneurysm	1.56	3.03	0.93
iii. Other diseases	1.60	2.67	1.07
a) Primary hypothyroidism	2.26	2.95	1.49
b) Chronic renal failure	1.55	2.88	1.10
c) Cirrhosis	1.76	2.88	1.11
d) Chest wall trauma	1.68	2.92	1.12
B. Hypoprolactinemia	1.19	2.59	0.81
a. Panhypopituitarism	1.07	2.71	0.88
C. Growth Hormone (Somatotropin)	1.21	2.64	0.88
a. Acromegaly	1.09	2.68	1.04

b. Gigantism	0.86	2.63	0.94
D. Pituitary Dwarfism	0.91	2.54	0.94
a. Gonadotropin:	1.11	2.59	0.97
i. Ectopic secretion	1.00	2.63	0.87
a) Germinomas	0.93	2.59	0.92
b) Precocious puberty	1.07	2.66	0.97
ii. Pituitary adenomas	1.42	2.75	0.89
a) FSH secreting	1.28	2.72	0.95
b) LH secreting	1.25	2.72	0.92
b. Thyrotropin	1.32	2.68	1.04
i. GH	1.20	2.63	0.98
a) Acromegaly	1.08	2.62	1.01
b) Depression	2.51	2.97	1.59
ii. Hyperthyroidism	2.17	2.95	1.47
iii. Primary hypothyroidism	2.42	2.95	1.53
iv. Secondary hypothyroidism	2.37	2.90	1.54
a) Pituitary disease	1.61	2.89	1.20
b) Hypothalamic disease	1.57	2.85	1.18
v. Pituitary or TSH induced hyperthyroidism	1.72	2.76	1.19
a) Tumors	1.59	2.93	0.96
b) Resistance to thyroid hormone	1.80	2.88	1.35
c. Adrenocorticotrophic Hormone (ACTH):	1.67	2.71	1.05
i. Excess ACTH	1.51	2.72	1.01
a) Cushing's syndrome	1.54	2.77	1.16
b) Nelson's Syndrome	1.05	2.62	1.10
ii. Causes of excess Cortisol:	1.94	2.73	1.30
a) Pituitary ACTH	1.37	2.77	1.17
b) Ectopic ACTH	1.28	2.73	1.08
c) Adrenal tumors	1.40	2.79	1.03
d) Exogenous corticosteroid administration	1.71	2.79	1.17
iii. ACTH Deficiency:	1.57	2.62	1.03

a) After prolonged glucocorticoid administration	1.53	2.68	1.14
E. Deficiency of Vasopressin (Diabetes Insipidus)	1.63	2.60	1.14
a. Causes affecting pituitary or hypothalamus:	1.66	2.69	1.08
i. Neoplastic lesions	1.33	2.84	0.90
ii. Infiltrative lesions	1.23	2.80	0.93
iii. Surgery	1.47	2.78	0.93
iv. Isotopic ablative therapy	1.22	2.73	0.96
v. Severe head injuries	1.86	3.04	1.39
F. Syndrome of Inappropriate AVP Secretion (SIADH):	1.03	2.57	0.89
a. Causes	1.53	2.64	0.97
i. Lung carcinoma	1.46	2.84	0.77
a) Small cell	1.24	2.78	0.75
b) Oat cell	1.15	2.74	0.75
ii. Nontumorous lung tissue	1.48	2.72	0.77
a) TB	1.31	2.82	0.83
b) Pneumonia	1.88	2.92	1.03
c) Other pulmonary diseases	1.76	2.89	1.03
G. Thyroid Disorders	2.65	2.93	1.48
1. Sick euthyroid	1.55	2.68	1.21
2. Simple nontoxic goiter	1.74	2.78	1.31
a. Iodine deficiency	1.73	2.81	1.71
b. Hypothyroidism	2.56	2.89	1.67
a) In children - Cretinism	1.00	2.68	0.97
b) In adults	2.00	2.74	1.33
c. Thyrotoxicosis	1.65	2.72	1.00
a) Abnormal thyroid stimulator	1.58	2.68	1.07
b) Grave's disease	1.90	2.82	1.28
d. Hyperthyroidism	1.99	2.84	1.32
e. Diffuse goiter	1.65	2.77	1.21
f. Ophthalmopathy	1.60	2.85	1.08
g. Dermopathy	1.50	2.73	1.05

a) Trophoblastic tumor	1.05	2.68	0.81
b) Intrinsic thyroid autonomy	1.10	2.65	0.91
3. Hyperfunctioning adenoma	1.29	2.77	0.91
4. Toxic multinodular goiter	1.32	2.76	0.93
5. Disorders of hormone storage	1.42	2.66	0.94
6. Thyoiditis	1.68	2.74	1.11
a. Subacute	1.52	2.70	1.19
b. Chronic	1.71	2.72	1.23
7. Ectopic thyroid tissue	1.21	2.60	0.86
a. Functioning follicular carcinoma	1.12	2.64	0.83
8. Complications of thyrotoxicosis	1.42	2.64	0.89
9. Thyrocardiac disease	1.24	2.74	1.00
10. Thyrotoxic crisis	1.16	2.77	1.00
11. Thyroiditis	1.55	2.72	1.12
12. Thyroid tumors	1.60	2.78	0.93
a. Adenomas	1.43	2.75	0.91
b. Carcinomas	1.40	2.79	0.84
H. Diseases of the Adrenal Cortex	1.62	2.77	1.03
a. Hyperfunction of the Adrenal Cortex	1.79	2.78	1.25
i. Excess cortisol	2.06	2.83	1.29
a) Cushing's syndrome	1.60	2.83	1.23
b) Causes	1.67	2.71	1.14
i) adrenal hiperplasia	1.30	2.69	1.00
ii) neoplasia	1.23	2.76	0.93
iii) exogenous	1.37	2.68	1.12
ii. Aldosteronism	1.25	2.68	0.90
a) Hyper secretion of aldosterone	1.19	2.68	0.94
b) Primary aldosteronism	1.18	2.71	0.93
i). adrenal adenoma	1.19	2.74	0.92
ii) adrenal carcinoma	1.15	2.71	0.85
c) Secondary aldosteronism	1.14	2.68	0.99
i) renin angiotensin system	1.36	2.70	0.99

iii. Syndromes of adrenal androgen excess	1.41	2.66	0.94
a) Hirsutism	1.39	2.67	1.00
i) Oligomenorrhea	1.63	2.70	1.16
ii) Acne	2.04	2.62	1.45
iii) Virilization	1.41	2.67	1.09
iv) Causes in women	1.77	2.63	1.06
1. Familial	1.55	2.62	1.10
2. Idiopathic	1.65	2.66	1.14
3. Polycystic ovaries	2.05	2.83	1.39
4. Tumor	1.37	2.82	0.88
5. Congenital adrenal hyperplasia	1.23	2.58	1.00
b. Hypofunction of the Adrenal Cortex	1.87	2.72	1.29
i. Addison's disease	1.49	2.69	1.20
a) Primary adrenocortical insufficiency	1.54	2.71	1.19
i) Causes	1.69	2.61	1.08
1. idiopathic	1.50	2.69	1.23
2. surgical removal	1.18	2.62	0.92
3. destruction from infection	1.07	2.66	0.96
4. hemorrhage	1.03	2.77	0.86
5. tumor	1.17	2.79	0.82

b) Secondary adrenocortical insufficiency	1.44	2.67	1.10
i) Causes	1.68	2.63	1.10
1. Hypopituitarism	1.36	2.69	1.07
2. exogenous steroid	1.57	2.76	1.15
3. steroid from tumor	1.16	2.71	0.95
c. Acute adrenocortical insufficiency	1.18	2.69	0.90
i. Causes	1.43	2.65	0.95
a) Sepsis	1.09	2.82	0.84
b) surgical stress	1.25	2.69	1.08
c) hemorrhagic destruction of both adrenal glands	1.05	2.69	0.85
i) anticoagulant therapy	1.45	2.76	1.03
ii) sometimes during pregnancy	1.41	2.77	1.08
I. Pheochromocytoma	1.25	2.71	0.80
a. Chromaffin tumors	1.03	2.61	0.73
i. Catecholamines	1.11	2.70	0.85
ii. Adrenal medulla	1.07	2.69	0.85
b. Familial	1.00	2.61	0.80
i. Autosomal dominant	0.97	2.59	0.81
ii. Neurofibromatosis type II	1.17	2.65	0.85
iii. Tumors are bilateral	1.00	2.66	0.78
c. Extraadrenal	0.96	2.63	0.76
i. abdomen ganglia	1.04	2.57	0.79
a) celiac	1.13	2.63	0.96
b) superior mesenteric	0.96	2.63	0.85
c) inferior mesenteric	0.96	2.62	0.85
d. Associated diseases	1.14	2.66	0.75
i. medullary carcinoma of thyroid in MEN	1.00	2.64	0.74
ii. Type II and III neurofibromatosis	1.08	2.70	0.88
J. Diabetes Mellitus	2.73	3.00	1.56
a. Type I (IDDM)	2.29	3.01	1.52

b. Type II (NIDDM)	2.87	3.08	1.83
c. Secondary diabetes	2.38	2.93	1.61
i. Pancreatic disease	1.67	2.88	1.15
ii. hormone abnormalities	2.19	2.82	1.44
iii. drug or chemical induced	1.89	2.81	1.28
iv. insulin receptor abnormalities	2.15	2.80	1.43
v. genetic syndromes	1.56	2.70	1.16
d. Complications of DM	2.36	2.88	1.36
i. Diabetic ketoacidosis	1.62	2.88	1.16
ii. Hyperosmolar coma	0.99	2.84	0.84
iii. Late Complications	1.86	2.84	1.09
a) Circulatory abnormalities	2.29	2.91	1.32
b) Retinopathy	1.86	2.89	1.18
c) Diabetic foot ulcers	1.77	2.80	1.20
d) Diabetic Neuropathy	2.62	2.97	1.78
i) Peripheral polyneuropathy	2.64	2.99	1.94
e) Mononeuropathy	2.42	2.94	1.83
f) Autonomic neuropathy	2.08	2.92	1.73
g) Variety of skin lesions	2.22	2.82	1.31
K. Abnormalities of Testicular Function	1.32	2.57	0.98
a. Hypothalamic/Pituitary	1.32	2.57	0.98
i. Panhypopituitarism	1.07	2.64	0.93
ii. Hypogonadotropic hypogonadism	1.11	2.62	0.89
iii. Cushing's	1.22	2.68	1.14
b. Testicular	1.22	2.61	0.90

i. Klinefelters Syndrome or XX male	0.88	2.57	0.82
ii. Acquired defects due to	1.40	2.64	0.92
a) viral infection	1.26	2.64	0.97
b) trauma	1.27	2.66	1.01
c) radiation drugs	1.18	2.64	0.90
d) systemic diseases	1.29	2.65	1.01
c. Sperm transport	0.96	2.55	0.88
L. Abnormalities of the Ovaries	1.78	2.67	1.07
a. Ovaries	1.78	2.67	1.07
b. Menstrual Cycle	2.34	2.87	1.56
c. Menopause i. Osteoporosis	2.52	2.92	1.63
M. Disorders Affecting Multiple Endocrine Organs	1.01	2.71	0.74
a. Multiple Endocrine Neoplasia, Type I (Werner syndrome)	1.01	2.71	0.74
b. Multiple Endocrine Neoplasia, Type II (Sipple syndrome)	0.87	2.72	0.69
c. Multiple Endocrine Neoplasia, Type III	0.87	2.75	0.69

3. Please indicate how important the following rehabilitation applications/treatment modalities are to the practice of chiropractic neurology and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. Rehab Application	3.16	3.08
1. Laboratory	2.60	3.04
a) Serum Prolactin levels	1.58	2.73
b) Glucose tolerance tests	2.23	3.00
c) Serum T3, T4 and FT4I	2.65	3.12
d) Calcium levels	2.51	3.06
e) Potassium levels	2.48	3.06
f) Vitamin D levels	2.70	3.09
g) Basal and random GH levels	1.62	2.75

h) Hormone levels	2.27	2.99
i) Osmolality	1.86	2.76
i) Plasma	2.20	2.81
ii) Urinary	2.35	2.92
j) Dehydration test	1.51	2.66
k) Dexamethasone suppression test	1.11	2.45
l) 24 hr urine	1.58	2.66
m) Cortisol Response	1.84	2.80
i) Plasma cortisol	1.64	2.62
ii) Urinary cortisol	1.61	2.64
n) Urine pH	2.24	2.88
o) Urinary glucose and ketones	2.23	2.90
2. Radiographically	2.56	2.86
a) CT/MRI scanning of hypothalamus/pituitary area of brain	1.74	2.86
b) Conventional skull x-rays	1.73	2.65
c) CT scan of abdomen	1.84	2.79
3. Clinically	2.92	2.97
a) History	3.43	3.17
i) Sexual	2.75	2.86
ii) Menstrual	3.05	2.91
iii) Breast	2.30	2.89
iv) Vision	3.13	3.06
v) Headaches	3.46	3.14
vi) Menstrual	3.05	2.99
vii) Sleep cycle	2.99	3.01
b) Physical and Neurological exam	3.64	3.30
i) Cranial Nerves	3.54	3.27
ii) Palpation	3.69	3.35
iii) Visual field	3.45	3.22
iv) Cardinal gaze	3.63	3.24
v) Pupillary responses	3.68	3.29
vi) Skin and hair texture and distribution	3.12	2.99
vii) Core temperature	2.78	2.92
B. Rehab Principle	3.35	3.11
1. Patient education	3.50	3.26
2. Refer out for medical management	2.68	3.08
a) Drug therapy	2.09	2.59
i) Bromocriptine	1.00	2.26
ii) Anti-thyroid agents	1.40	2.42
b) Surgery	1.57	2.61
c) Radiation therapy	1.07	2.43
d) Hormone replacement	1.63	2.43

Survey 23: Cognitive Area: Pain

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used related to pain.

1. Please indicate how important knowledge of the following functional anatomy is to the practice of chiropractic neurology and how frequently you use this in your practice.

Items	Frequency Weight	Importance Weight
A. Spinothalamic pathway, a lateral pain pathway: three neuron pathway	3.66	3.42
1. Trunk and Limbs: 2nd order neuron in posterior gray horn and crosses to ascend via spinothalamic pathway to ventral posterolateral nucleus of thalamus and then to primary somatic sensory cortex (location, severity) and lateral sulcus (visual attention to stimulus source).	3.59	3.36
2. Head and Neck: 2nd order neuron in the spinal nucleus of the trigeminal nerve and travels via trigeminal thalamic projection to contralateral ventral posterior medial nucleus and then to primary somatic sensory cortex and lateral sulcus.	3.48	3.39
B. Spinoreticular/trigeminoreticular	3.37	3.28
1. Polysynaptic via spinoreticular and trigeminoreticular tracks to	3.32	3.27

<p>a) the contralateral medial dorsal thalamic nucleus and then on to the interior cingulate cortex (concerned with effective/emotional component of pain)</p>	<p>3.22</p>	<p>3.22</p>
<p>b) reticular formation of medulla and pons. Many fibers do not cross the midline.</p>	<p>3.13</p>	<p>3.24</p>
<p>C. Spinomesencephalic: via anterolateral quadrant of spinal cord projects neurons from laminae I and V to mesencephalic reticular formation and periaqueductal gray and then via spinoparabrachial tract to the parabrachial nuclei that then project to the amygdala that is involved with the affective/emotional component of the pain experience.</p>	<p>3.37</p>	<p>3.26</p>
<p>D. Cervicothalamic tract: nociceptive neurons in laminae III and IV mostly cross the midline and ascend in the medial lemniscus of the brain stem to lateral cervical nucleus in the midbrain and then to the ventroposterior lateral and posteromedial nuclei of the thalamus. Some axons from laminae III and IV project through the dorsal columns of the spinal cord and terminate in the gracile and cuneate nuclei of the medulla.</p>	<p>3.39</p>	<p>3.25</p>

E. Spinothalamic tract: neurons in laminae I, V, and VIII project directly to the supraspinal autonomic control centers and activates neuroendocrine and cardiovascular responses associated with pain.	3.28	3.26
F. Fibers	3.47	3.25
1. c fibers (unmyelinated, .5 – 2 m/s); dull, aching pain; polymodal nociceptors (mechanical deformation, intense heat/cold, and irritant chemicals).	3.51	3.29
	3.52	3.27
2. delta fibers (myelinated, 25 m/s); sharp pain; severe mechanical deformation of the skin.	3.47	3.29
	3.38	3.26
G. 1st order pain neurons activate segmental IML	3.45	3.36
H. Mesencephalic pain inhibition	3.47	3.36
1. Peri-aqueductal gray matter (PAG) sends excitatory projections to the Nucleus Raphe Magnus that sends bilateral caudal projections (serotonergic) via Lissauer's tract to terminate in the substantia gelatinosa at all levels of the spinal cord to excite enkephalinergic interneurons (GABA-ergic) that are inhibitory to the second order pain neuron.	3.40	3.30
2. Locus ceruleus neurons (noradrenergic) descend to inhibit the second order pain neuron.	3.32	3.30

I. Segmental pain inhibition: A fibers (mechanoreceptors) activate inhibitory interneurons that in turn inhibit excitatory interneurons and second order neuron of the pain pathway.	3.39	3.31
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2. Please indicate how important knowledge of the following disease processes/diagnoses is to the practice of chiropractic neurology and how frequently you use this knowledge in your practice and how you manage these issues with your patients.

Items	Frequency Weight	Importance Weight
A. Complex regional pain syndrome	2.54	3.28
B. Neurogenic inflammation: local C fiber release of one or more peptide substances, notably substance P, which binds with receptors on the walls of arterioles, leading to arteriolar dilatation, and also binds with receptors on the surface of mast cells, stimulating them to release histamine which increases capillary permeability and leads to local accumulation of tissue fluid, the wheal response.	3.16	3.29
C. Chronic pain associated with decreased brainstem function.	3.25	3.29
D. Chronic pain associated with decreased interneuronal function.	2.90	3.14
E. Hypoxic nociceptive depolarization	3.21	3.23
F. Neuropathic pain: secondary to direct injury to nerve	3.04	3.23
G. Fibromyalgia	3.27	3.26
H. Labor pain	1.77	2.88
I. Post-surgical acute pain	2.22	2.96
J. Cancer related pain	2.06	3.04
K. Arthritic pain	3.56	3.29
a. Rheumatoid	3.12	3.21
b. Osteo	3.43	3.29

L. Muscle pain	3.69	3.31
a. Spasm	3.69	3.27
b. Pull	3.30	3.20
c. Tear	2.95	3.17

3. Please indicate how important the following rehabilitation principles are and how frequently you use these principles in your practice.

Items	Frequency Weight	Importance Weight
1. Segmental relationship to pain inhibition	3.59	3.36
2. Mesencephalic relationship to pain inhibition	3.44	3.29
3. Suprasegmental signaling into cord	3.47	3.31
4. Hypoxic relief	3.13	3.29
5. Metabolic capacity	3.53	3.36
6. Central integrated state and potential for plastic change	3.65	3.36
7. To achieve great probability of CNS change:	3.60	3.32
a. fast adapting receptors need to be stimulated with varying amplitudes or patterns	3.47	3.29
b. slowly adapting receptors will maintain a change in firing rate with a new, but constant stimulus	3.42	3.27
8. Receptors that fire frequently (slowly adapting or associated with a frequently changing system) and are very responsive to change (high sensitivity) often have the greatest CNS input; these are mostly proprioceptors and vestibular receptors. Proprioceptors inhibit pain segmentally and vestibular receptors activate pontine inhibition of IML.	3.53	3.33
9. Cortical stimulation left and/or right	3.68	3.36

4. Please indicate how important the following treatment modalities are and how frequently you use them in your practice.

Items	Frequency Weight	Importance Weight
A. Thermal	3.13	2.87
1. Ice/cold packs	2.97	2.79
2. Heat packs	3.01	2.78
3. Alternating heat and cold	2.60	2.64
B. Interferential	2.39	2.56
C. Ultrasound	2.21	2.57
D. Massage	3.01	2.78
E. Cortical stimulation	3.74	3.40
1. Right brain modalities	3.71	3.40
2. Left brain modalities	3.77	3.41
F. Exercise	3.75	3.42
G. Vibration	3.40	3.05
H. Light touch	3.29	3.08
I. Adjustments	3.83	3.55
J. Oxygen therapy (gain referral if necessary in your state/province)	1.87	2.94
K. Referral for allopathic intervention	2.62	3.05

5. Please indicate how important the following diagnostic issues are to the chiropractic neurologist and how frequently you use them in your practice:

Items	Frequency Weight	Importance Weight
A. History taking differentiating:	3.74	3.54
1. Nociceptive receptor activation	3.61	3.40
2. Decreased suprasegmental pain inhibition	3.56	3.40
3. Neuropathic	3.39	3.34
4. Central lesions	3.45	3.43
5. Organic pain	3.40	3.34
6. Situational issues potentiating pain	3.35	3.23
a. Divorce	2.84	2.99
b. Grief	2.92	3.00
c. Financial difficulty	2.93	3.00
d. Loss of any sort (empty nest, loss of status, move to new local, etc.)	2.89	3.01

e. Drug &/or alcohol abuse	2.75	3.13
f. Chronic prescription drug use	3.03	3.17
B. Complete neurological examination with emphasis on:	3.63	3.48
1. Autonomic Nervous System	3.58	3.38
2. Complete brainstem function	3.41	3.33
i. Mesencephalic	3.51	3.36
ii. Pontine.	3.50	3.37
3. Limbic system contributions	3.33	3.32
4. Cortical centers of pain appreciation regarding:	3.46	3.38
i. Location	3.39	3.30
ii. severity of receptor activation	3.44	3.32
iii. affect	3.39	3.26

Survey 24: Cognitive Area: Special Studies

The purpose of this survey is to determine the frequency and importance of the cognitive information and the treatment modalities used.

1. How important is your knowledge about the following special studies in diagnosing and treating your patients and how frequently do you order them? How do you manage the special studies (perform yourself, refer, etc.)

Items	Frequency Weight	Importance Weight	Management Responsibility Weight
1. How important is your knowledge about the following special studies in diagnosing and treating your patients and how frequently do you order them? How do you manage the special studies (perform yourself, refer, etc.)	3.11	3.28	2.25
a. Imaging studies:	3.01	3.30	2.17
i. Arteriograms/Angiography	1.64	3.04	1.60
1) WADA (speech center)	0.96	2.48	1.22
ii. Barium Studies	1.22	2.49	1.19
1) Swallow	1.21	2.48	1.22
2) Upper GI	1.24	2.49	1.21
3) Lower GI	1.24	2.51	1.21
4) Other Barium studies	1.18	2.44	1.17
iii. Bone density scan	1.87	2.81	1.76
iv. CT Scans	2.28	3.07	1.93
v. Diagnostic Ultrasound	1.95	2.83	1.77
vi. Doppler Vascular Studies	1.87	2.96	1.68
vii. fMRI	1.25	2.88	1.69
viii. MRI	2.69	3.28	2.20
ix. MRa	1.76	3.00	1.83
x. Myelogram	1.09	2.64	1.51
xi. Nuclear Medicine Bone Scan	1.28	2.83	1.39
xii. Plain Film Radiology	3.17	3.11	2.75
xiii. PET	1.18	2.79	1.48
xiv. Regional cerebral blood flow	1.00	2.83	1.36

xv. Sinu-rhinology	0.79	2.35	1.19
xvi. SPECT	0.92	2.66	1.40
xvii. Thermography	1.06	2.34	1.64
xviii. Retrograde pyelogram	0.64	2.36	1.13
xix. Cystoscopy	0.77	2.41	1.15
b. Electrodiagnostic Studies:	2.22	3.06	2.06
i. Evoked Potentials	1.72	3.01	2.03
1) Brainstem Auditory Evoked Potentials	1.56	3.05	1.95
2) Visual Evoked Potentials	1.55	3.04	1.92
3) Somatosensory Evoked Potentials	1.61	3.04	2.10
ii. Electrocardiogram	1.62	2.94	1.51
1) Exercise stress test	1.56	2.94	1.53
2) Chemical stress test	1.07	2.68	1.35
iii. Electroencephalography	1.49	2.87	1.62
iv. Electronystagmography	1.59	2.99	1.96
v. Needle Electromyography	1.92	3.04	2.06
vi. Nerve Conduction Velocity	2.10	3.06	2.19
vii. Quantitative Electroencephalography	1.32	2.87	1.76
c. Other diagnostic Studies	1.17	2.21	1.27
i. Advanced Quantitative Gustatory testing	0.62	2.24	1.34
ii. Advanced Quantitative Olfactory testing	0.67	2.28	1.46
iii. Auscultatory Examination:	2.93	3.04	2.65
1) Subclavian bruit	2.48	3.05	2.31
2) Carotid bruit	2.79	3.11	2.38
3) Temporal bruit	2.42	3.04	2.32
4) Intracranial (Orbital) bruit	1.95	2.96	2.12
5) Heart	3.09	3.17	2.52
6) Lungs	3.04	3.14	2.54
7) Abdomen	2.93	3.06	2.58
iv. Audiometric Examination	1.71	2.79	1.72
v. Tympanography	1.22	2.64	1.40
vi. Bronchoscopy	1.12	2.53	1.33
vii. Balance Testing	3.16	3.23	2.96
viii. Bimanual pelvic exam	1.06	2.57	1.37

ix. Caloric Testing	1.84	3.09	2.84
x. Colonscopy	1.14	2.73	1.14
xi. Diagnostic educational testing	1.21	2.50	1.56
xii. Dichotic listening	0.91	2.42	1.52
xiii. Dynamic walking orthotic scanning	1.45	2.40	2.04
xiv. Endoscopy	1.18	2.61	1.16
xv. Fundoscopy	2.64	2.96	2.64
xvi. Gustatory Zinc testing	1.17	2.39	1.82
xvii. Just Noticeable Difference Testing	1.24	2.25	1.76
1) Hue	0.91	2.23	1.67
2) Intensity	1.00	2.28	1.67
3) Saturation	0.95	2.28	1.61
4) Distance apart to see 2 separate images	1.19	2.36	1.91
5) Pitch, decibel	1.16	2.41	1.75
6) Touch and distance apart	1.78	2.53	2.28
xviii. Mammogram	1.20	2.66	1.08
xix. Neuro-psychologic testing	1.49	2.68	1.52
xx. Behavioral testing	1.32	2.62	1.50
xxi. TOVA testing	1.09	2.41	1.44
xxii. PAP	1.01	2.56	1.00
xxiii. Posturography	2.05	2.83	3.05
xxiv. Quantitative Strength Testing	2.19	2.86	2.97
xxv. Skin temperature	2.20	2.77	3.20
xxvi. Spirometry	1.51	2.69	2.13
xxvii. Video nystagmography	1.81	3.06	2.73
xxviii. Visual studies	1.68	2.72	1.91
1) Anslar grid	0.99	2.48	1.49
2) Florescein	0.79	2.31	1.31
3) Retinal photography	0.94	2.50	1.46
4) Tonometry	0.84	2.37	1.39
5) Visual field, perimetry	2.18	2.78	2.17
d. Laboratory Studies:	2.67	3.09	2.35
i. Basic Metabolic Profile	2.48	2.97	2.25
ii. Biopsy	1.11	2.63	1.03
1) Bowel	1.03	2.64	1.08
2) Lung	1.00	2.58	1.04

3) Nerve	1.13	2.69	1.23
4) Muscle	1.16	2.68	1.25
5) Liver	0.99	2.60	1.01
6) Kidney	1.04	2.60	1.06
7) Skin	1.07	2.64	1.14
8) Stomach, other GI	1.03	2.62	1.08
9) Cervical	0.84	2.56	1.01
10) Ovarian	0.84	2.56	0.93
11) Uterine	0.84	2.54	0.93
12) Amniocentesis	0.76	2.44	0.84
13) Cysts	1.01	2.55	0.94
iii. CBC	2.71	3.01	2.32
iv. CBC with diff	2.67	3.05	2.36
v. Culture & sensitivity	1.56	2.85	1.71
vi. Cytokine levels	1.53	2.81	2.12
vii. DNA testing	1.18	2.79	1.71
viii. Food allergy/sensitivity	2.33	3.08	2.57
ix. Genetic testing	1.35	2.78	1.70
x. Hair analysis	1.06	2.29	2.03
xi. Heavy metal testing	1.51	2.77	2.19
xii. Hemoglobin A1C	2.31	3.04	2.34
xiii. HIV	1.12	2.88	1.23
xiv. Testing for Illegal drugs	0.99	2.64	1.21
xv. Kidney panel	1.90	2.91	1.91
xvi. Liver panel	2.08	2.91	2.00
xvii. Lumbar Puncture	0.96	2.64	1.17
1) Hemorrhage	0.85	2.70	1.06
2) Cells	0.95	2.65	1.24
3) Electrophoresis	0.78	2.59	1.15
4) Glucose	1.91	2.92	1.69
5) Opening pressure	0.85	2.58	1.19
xviii. Lyme testing	1.63	2.92	1.88
xix. Ova & Parasite	1.50	2.90	1.79
xx. Pharmacokinetics testing- monitor therapeutic blood levels, detecting early toxicity	1.11	2.72	1.31
xxi. Postprandial blood glucose	1.51	2.78	1.71
xxii. Salivary cortisol	1.77	2.93	2.39
xxiii. Serum Folate	2.09	2.91	2.49
xxiv. Serum Vit B12	2.18	2.99	2.50

xxv. Serum 25 hydroxy - vitamin D	2.44	3.10	2.61
xxvi. Sputum culture	1.06	2.59	1.49
xxvii. Stool analysis fat content	1.37	2.67	1.84
xxviii. Thyroid Function	2.59	3.14	2.30
1) TSH	2.61	3.12	2.33
2) Free T4	2.59	3.11	2.30
3) Calculated Free T3	2.58	3.07	2.32
4) Reverse T3	2.30	3.00	2.25
5) T3 uptake	2.34	3.00	2.28
6) Thyroid Antibodies	2.41	3.09	2.30
xxix. UA with microscopic, cast	1.78	2.79	1.95
xxx. 24 hr VMA	0.91	2.52	1.52
xxxi. 24 hr Urinary halide with Iodine loading	0.82	2.57	1.49

Appendix C

Expanded Performance Exam Blueprint

Performance Exam Blueprint	Percent of the Exam
Review& Clarification of pre-screen history	12.54%
Vital Signs	10.82%
Cranial Nerves	8.96%
Physical Exam: Sensory	9.82%
Physical Exam: Motor	10.25%
Physical Exam: Muscle Stretch Reflexes	9.39%
Physical Exam: Cerebellum/Vestibular	9.75%
Basal Ganglia	10.68%
Limbic	9.71%
Cognitive	8.06%

Items to be Included in Performance Exam
Vital Signs Meeting Decision Rule
Pulse: Bilateral
Respirations
Blood Pressure: Bilaterally
Pulse Oxygen level
Cranial Nerve Tests Meeting Decision Rule
Cranial Nerve I
Olfaction: Test?
Each side perceives?
Each side identifies scent?
Cranial Nerve II
Visual Field
Fundoscopy
Cranial Nerve III
Oculomotor:
Measure pupil diameter
Direct pupillary light reflex
Consensual pupillary light reflex
Corneal light reflection
Response to near vision
Repeated convergence
Cover/Uncover

Cranial Nerves III. IV & VI
H-Pattern
Cranial Nerve V: Trigeminal
Deviation of jaw?
Palpate TMJ for prominence/clicks on opening & closing?
Sensation on V1, V2 & V3 touch?
Sensation on V1, V2 & V3 sharp?
Cranial Nerves V & VII
Corneal Reflex one time?
Cranial Nerve VII: Facial Muscles of Expression
Frown
Eye Closure
Smile-volitional
Smile-spontaneous
Purse lips
Puff cheeks
Cranial Nerve VIII: Hearing & Vestibular
Weber
Rinne
Infants only (startle/loud noise)
Infants only Moro
Cranial Nerve IX: Glossopharyngeal
Observe palatal atrophy
Cranial Nerves IX & X: Gag
Gag on each side?
Swallow?
Observe palatal fatigue on intonation of AHH?
Cranial Nerve XI
Strength testing of upper trapezius?
SCM strength testing?
Cranial Nerve XII: Hypoglossal
Observe resting tongue for deviation in mouth?
Deviation on protrusion of tongue?
Equal volitional movement of tongue left & right?
Strength of tongue push inside of cheek side to side?

Sensory Testing
Light Touch
Evaluate touch over dermatomes in upper extremities
Evaluate comparison of touch perception equalities side to side in upper extremities
Evaluate touch over dermatomes in lower extremities
Evaluate comparison of touch perception equality side to side in lower extremities
Vibration
Evaluate vibration perception over dermatomes in upper extremities
Evaluate cessation of vibration perception accuracy in upper extremities
Evaluate comparison of perception of vibration side to side in upper extremities
Evaluate vibration perception over dermatomes in lower extremities
Evaluate cessation of vibration perception accuracy in lower extremities
Evaluate comparison of perception of vibration side to side in lower extremities
Sharp Touch
Evaluate sharp over dermatomes in upper extremities
Evaluate comparison of sharp perception equalities side to side in upper extremities
Evaluate sharp over dermatomes in lower extremities
Evaluate comparison of sharp perception equality side to side in lower extremities
Motor Testing
Strength Muscle Testing
Muscle Testing for Strength
Do you observe for asymmetry of bulk side to side
Do you observe for soft pyramidal paresis in the upper extremity
Do you observe for soft pyramidal paresis in the lower extremity
Do you evaluate active range of motion in the upper extremity
Do you evaluate active range of motion in the lower extremity
Do you observe active range of motion in the cervical spine
Do you measure range of motion in the cervical spine
Do you evaluate for hypotonia (increased passive range of motion)

Do you evaluate for hypertonia on passive range of motion
Do you do a postural assessment
Do you do a gait assessment
During the gait assessment, do you instruct the patient to turn around and come back toward you
Do You Grade the Strength When You Perform Manual Muscle Tests
Deltoid
Biceps
Brachioradialis
Triceps
Wrist extensors
Wrist flexors
Finger extensors
Finger flexors
Finger Abductors
Finger Adductors
Extensor Hallucis Longus
Ankle invertors
Ankle evertors
Ankle dorsiflexors
Ankle plantarflexors
Quadriceps
Hamstrings
Hip flexors
Hip extensors
Hip abductors
Hip adductors
Reflexes
Muscle Stretch Reflexes
Biceps
Triceps
Brachioradialis
Patellar
Ankle
MSR: Reinforced (Jendrasik)
Jendrasik on upper extremities
Jendrasik on lower extremities
Pathologic Reflexes
Do you evaluate for Hoffman's reflex?
Do you evaluate for a Plantar response (Babinski)?
If the Plantar response elicited is extensor (non-infant), do you evaluate for: Chadock's

Cerebellum/Vestibular Testing
Rhomberg eyes open & closed; with head positioning
Tandem Stance Right leg forward & then left leg forward
Tandem Gait
One leg standing eyes open & eyes closed
Finger to Nose eyes closed
Heel to shin
Arm raise
Finger to Finger eyes open & eyes closed
Finger to Finger moving target
Alternating hand movement; extended and elbow flexed
Thumb to each finger
Hypermetric saccade testing
OPK
VOR Vestibular Ocular Response Testing with & without fixation
Canal related eye weakness-hypo or hypertropia OPK, head position
Rebound and check
Positional testing (Dix-Hallpike, etc.)
Basal Ganglia Testing
Speech
Finger coordinating movement (piano playing)
Observation of movement at rest
Eyes closed-observe for eye blepharospasm
Observation of initiation of movement
Observation of spontaneous saccades
Muscle tone
Pupillary light response
Gait/shuffling steps/turning
Limbic System Testing
Social testing-answer questions reasonably
Normal questioning without outbursts
Emotional responses to sensory input (light, smell, pinwheel)
Affect-inappropriate for situation
Cognitive Assessment
History responses
Memory of sequencing
Oriented X3
Mathematical Calculations
Right & left brain questioning
Conversational assessment of hyperactivity
General questions regarding attention and hyperactivity

General questions
Long term versus short term versus immediate recall memory (not immediate but what did you have for breakfast)
Field of Vision
Blind Spot Mapping
Hemisphericity
Mood

Appendix D: References

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