

Outcome measures and their everyday use in chiropractic practice

Dr. Paul M. Hinton, DC, FCCRS(C)*

Dr. Randall McLeod, DC, FCCRS(C), DACRB‡

Dr. Blaine Broker, DC, FCCRS(C)†

Dr. C. Elizabeth MacLellan, BSc, DC, FCCRS(C)§

Objectives: *To describe the extent to which chiropractors utilize standardized outcome and various clinical measures to systematically document patients' baseline health status and responses to treatment, with particular consideration being given towards quantifiable outcome instruments.*

Study design: *Cross-sectional mailed survey.*

Participants: *Registered chiropractors in the province of Saskatchewan.*

Methods: *A survey was mailed to all registrants of the Chiropractors' Association of Saskatchewan. Respondents graded their frequency of using various standardized pencil-and-paper instruments and functional chiropractic, orthopaedic and neurological tests in the contexts of both the initial intake assessment ('always,' 'commonly,' 'occasionally,' or 'never') and the course of subsequent treatment (after 'each visit,' after '9-12 visits,' 'annually,' when patient 'not responding,' on 'dismissal/discharge,' 'never' or for some 'other' reason). Data were tabulated for all item and response category combinations as frequencies and percentages using the total sample size as the denominator.*

Results: *Of 164 registered chiropractors, 62 (38%) returned a completed questionnaire. A pain diagram was the most commonly used subjective outcome measure and was administered routinely (either "always" or "commonly") by 75% of respondents, at either the initial consultation or during a subsequent visit. Numerical rating and visual analogue scales were less popular (routinely used by 59% and 42% respectively). The majority of respondents (80%) seldom ("occasionally" or "never") used spine pain-specific disability*

Objectif : *Décrire l'étendue de l'utilisation d'indicateurs de résultats standardisés et de mesures cliniques variées par les chiropraticiens afin de documenter systématiquement le niveau de l'état de santé initial des patients et leur réponse au traitement, en mettant l'évidence sur les instruments de mesure des résultats.*

Type d'étude : *Enquête transversale expédiée par la poste.*

Participants : *Chiropraticiens enregistrés en Saskatchewan.*

Méthodologie : *Un sondage a été expédié par la poste à tous les membres de la Chiropractors' Association of Saskatchewan. Les répondants ont noté leur fréquence d'utilisation de divers instruments papier-crayon standardisés et de tests fonctionnels chiropratiques, orthopédiques et neurologiques standardisés dans les contextes de l'évaluation initiale (« toujours », « souvent », « à l'occasion » ou « jamais ») et au cours du traitement subséquent (après « chaque visite », après « de 9 à 12 visites », « annuellement », lorsque le patient « ne répond pas », lors de l'« abandon », « jamais » ou pour une « autre » raison). Les données ont été totalisées pour tous les articles et toutes les combinaisons de catégories de réponses sous forme de fréquence et de pourcentages en utilisant en tant que dénominateur la taille totale de l'échantillon.*

Résultats : *Des 164 chiropraticiens enregistrés, 62 (38 %) nous ont rendu un questionnaire rempli. Un diagramme de la douleur était l'outil de mesure subjectif le plus communément utilisé et était administré couramment (soit « toujours » ou « communément »)*

* Corresponding Author: Private practice, Nelson, BC. Tel: 250 352-5135. Email: pchinton@shaw.ca

† Private practice, Prince Albert, SK. Tel: 306 922-7028. Email: b.d.broker@sasktel.net

‡ Private practice, Stony Plain, AB, Tel: 780 963-4608. Email: ihc.doctor@xplornet.com

§ Private practice, Calgary, AB. Tel: 403 508-7000. Email: office@northgatechiropractic.ca

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indices such as the Low Back Revised Oswestry, Neck Disability Index or the Roland-Morris Questionnaire. As well, they did not use standardized psychosocial instruments such as the Beck Depression Index, or general health assessment measures such as the SF-36 or SF-12 questionnaire. Neurological testing was the most commonly used objective outcome measure. Most respondents (84% to 95%) indicated that they continually monitored neurological status through dermatomal, manual muscle strength and deep tendon reflex testing. Ranges of motion were routinely measured by 95% of respondents, usually visually (96%) rather than goniometrically or by some other specialized device (7%).

Conclusions: Our findings suggest that the majority of chiropractors do not use psychosocial questionnaires or condition-specific disability indices to document baseline or subsequent changes in health status. Chiropractors are more likely to rely on medical history taking and pain drawings during an initial intake assessment, as well as neurological and visually estimated range of motion testing during both initial intake and subsequent treatment visits.

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KEY WORDS: outcome measure, survey, Saskatchewan, chiropractor.

Introduction

There is a continuing trend in the health care industry towards a consumer driven market. Government health insurance plans, private health insurance carriers, employers and unions all have a vested interest in controlling spiraling costs and understanding treatment efficacy.^{1,2} To

par 75 % des répondants, soit lors de la consultation initiale ou au courant de l'une des visites subséquentes. L'évaluation chiffrée et les échelles analogues visuelles étaient moins populaires (couramment utilisées par respectivement 59 % et 42 % des répondants). La majorité des répondants (80 %) utilisaient rarement (« à l'occasion » ou « jamais ») des indices d'invalidité spécifiques à la douleur de la colonne vertébrale comme le Low Back Revised Oswestry, l'index d'invalidité au cou ou le questionnaire Roland-Morris. De plus, ils n'utilisaient pas d'instruments psychosociaux standardisés tels que l'inventaire de dépression de Beck, ou d'outils servant à évaluer l'état de santé général comme les questionnaires SF-36 ou SF-12. L'évaluation neurologique était l'indicateur des résultats le plus communément utilisé. La plupart des répondants (de 84 % à 95 %) ont indiqué qu'ils surveillaient de façon continue l'état neurologique par l'évaluation au niveau des dermatomes, de la force musculaire manuelle et des réflexes tendineux. L'amplitude des mouvements était couramment mesurée par 95 % des répondants, habituellement de manière visuelle (96 %) plutôt que de manière goniométrique ou par un autre appareil spécialisé (7 %).

Conclusion : Nos résultats suggèrent que la majorité des chiropraticiens n'emploient pas de questionnaires psychosociaux ou d'indices d'invalidités spécifiques au problème afin de documenter le niveau de base ou les changements subséquents dans l'état de santé. Les chiropraticiens ont plus tendance à se fier à l'historique médical et aux diagrammes de la douleur lors de l'évaluation initiale, ainsi qu'aux tests neurologiques et à l'amplitude des mouvements estimée à l'œil lors de l'évaluation initiale et des traitements subséquents.

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MOTS CLÉS : indicateur des résultats, enquête, Saskatchewan, chiropraticien.

help them in their decisions, third party payers such as Workers' Compensation boards and automobile insurance corporations presently require the attending clinician to provide documented evidence of a patient's response to care over time. There was a time when the expressed opinion of a doctor was all the evidence that was required.

However, as health care moves forward, there is an ever increasing challenge facing every health profession to provide (quantifiable) documented evidence of biological as well as psychosocial dysfunction and to provide proof that these factors improve more favorably with care than without.³

The use of outcome assessments is essential in modern health care to assess quality of care and contain costs.^{1p.147} Usually during the initial consultation a clinician will use various outcome measures to establish baselines and then monitor these defined parameters as a gauge of progress. In recent years the Canadian Chiropractic Association has promoted the utilization of outcome measures by providing its membership with specific examples and guidelines.

There are two general types of outcome measures used in chiropractic practice: (1) patient-administered self-reporting instruments, and (2) clinician-administered functional assessment methods. Self-reporting measures rely on the patient's own assessment of their current health status.⁴ Throughout most of the history of health care the patient and the health care provider determined whether the patient was making satisfactory improvement through simple conversation.^{5p.226} Over the past few decades there has been a shift towards self-reporting instruments that are practical, reliable, valid and responsive to changes in clinical status. There are an enormous number of patient self-reporting outcome measures available to all health and social science disciplines. The MAPI Research Trust in Lyon France has developed a database which contains descriptions of over 470 validated patient-reporting outcome and quality of life instruments (PROQOLID).⁶ Within that database, they are organized into three basic categories: (1) pathology or disease specific, (2) population and (3) generic. The PROQOLID data base was created to present an overview of existing Patient Reported Outcome (PRO) instruments as well as relevant and updated information on each. The Oswestry Low Back Disability Index (OLBDI),⁷ Roland Morris Disability Questionnaire (RMDQ),⁸ Neck Disability Index (NDI)⁹ and the Bournemouth Back Questionnaire (BBQ)¹⁰ are but a few of the instruments that consist of scales covering pain intensity, disability in activities of daily living, and social life and fear-avoidance behavior specifically due to neck or back pain. Their utilization is designed to enhance doctor-patient communication and improve goal setting and decision making.

Pain scales and pain drawings are also accepted methods of patient self reporting. Measuring pain intensity can be accomplished by using verbal rating scales, visual analog scales and numerical rating scales. The pain drawing or diagram is perhaps the best way to obtain the patient's perception of the location of their symptoms.¹¹

Patient self-reporting using standardized questionnaires of physical function has clinical usefulness but may not be a valid reflection of a patient's actual functional status.^{1p.261} Despite the fact that there is variability in the reliability between patient-driven subjective measures and clinician-driven objective measures there is no excuse to ignore the utilization of objective measures.¹² The physical medicine rehabilitation field has long been the leader in developing clinically sensitive, objective functional outcome measures that can be used in typical clinical settings. A clinician-directed functional outcome measure should provide a baseline by which to measure a physical impairment or loss of some ability of the body as a pathological, anatomical or physiological abnormality in structure of function.³ Ideally the functional outcome measure should be quick, simple and most important be able to quantitatively determine a patient's baseline level of physical function. Established baseline levels are necessary for identifying and classifying the severity of functional deficits, which in turn help clinicians to define subsequent treatment targets and therapeutic goals. A favorable change in status not only reassures patient but also provides diagnostic and treatment justification for both the clinician¹² and third party payors. Ultimately functional outcome measures should provide an objective quantifiable baseline that will influence treatment decisions and provide a meaningful end point of care. The clinician should focus on assessing physical function that identifies movement difficulties that relate to activities of daily living (ADL).

One of the most basic functional assessments is simply measuring the patient's active and passive range of motion.^{13,14} The presence or absence of normal motion and whether pain was present or increased during the motion evaluation should be of interest to the clinician. Movement difficulties could also reflect deficiencies with muscle strength and endurance. The first line of defense to protect a joint complex is the muscles that surround it. While Biering-Sorensen showed that decreased torso extensor endurance predicts those who are a greater risk

of future back pain, recent work by McGill suggested that the balance of endurance among the torso flexors, extensors and lateral musculature better discriminates those who have had back problems from those who have not.¹⁵ There are standardized performance tests that provide normative values for strength and endurance, which allow practitioners to more accurately assess each patient's performance in relation to other members of the general population who are similar in terms of age, gender and vocation (blue collar versus white collar).^{1p.229,16,17}

The combined usage of patient-administered and clinician-administered outcome measures should be viewed as the expected standard of care as this protects the patient from ill-defined treatment thresholds and needless costs, particularly when there is no established end point of care.

It is not known whether individual chiropractors are incorporating such outcome measures into their case management. The purpose of this study was to determine the extent to which a range of relatively common outcome instruments applicable to chiropractic practice were being utilized by chiropractors.

Methods

The study design was a cross-sectional mailed survey. The target population was practicing Canadian chiropractors. However, the sample frame was all practitioners currently registered with the Chiropractors' Association of Saskatchewan (CAS). This frame was chosen as a manageable representative sample of Canadian chiropractors.

Membership in the CAS is a mandatory requirement for practice in Saskatchewan. For this study, all of the 164 registered members were invited to participate in the survey via a mail-out invitation. Their responses were to be either mailed or faxed back to the researchers.

Questionnaire design

The choice of outcome instruments to inquire about in this survey was challenging. One data base alone yielded several hundred different pen and paper instruments. We elected to inquire about instruments which tended to be commonly cited within the rehabilitation community, and that would also be likely to be familiar to and/or be perceived as being a "gold standard" within the chiropractic community at large. As one of the purposes of systematically assessing outcomes is the communication of subsequently collected data to third parties (both within and

outside of the chiropractic profession) we did not restrict our choice of instruments to those that were necessarily specific to chiropractic patients or conditions. Only one lesser known instrument (the Patient-Rated Wrist Evaluation [PRWE]) was inquired about in our survey simply because it was going to be described at length at an upcoming Saskatchewan Worker's Compensation seminar. However, even though this instrument was "on the desktop" as it were, we do not feel its inclusion biased the results of this study. (We feel this position is supported by the overall lack of utilization of this instrument despite it's having had a current advocate in the SWC.) In general, although we included some common diagnostic procedures, our primary purpose was twofold; principally to see if practitioners were utilizing quantifiable studies and secondly, are they performing regular monitoring (re-evaluations) of their relevant intake findings.

The survey was subdivided into seven categories (Appendix 1). Four of these categories (General Health, Pain Scales, Disability Indexes and Psycho-Social) were considered subjective patient self-reporting measures. The other three (Postural Evaluation, Ranges of Motion and Neurological Assessment) were considered functional outcome measures. Each category included an "other" option for the respondent to specify any additional instrument(s) of their choice.

The first category entitled "General Health" listed the following outcome measure instruments:

- Medical Review (patient history)
- SF 36/12

The next category was "Pain Scales," for which the following four methods were listed:

- Patient description
- Visual analogue scale (sliding scale 0 to 100)
- Numerical rating scale (Borg digital 0 to 10)
- Pain diagram

The third category, "Disability Indexes" consisted of eight instruments.^{7,8,9,18,19,20,21}

- Low Back Revised Oswestry
- Roland Morris Questionnaire
- Neck Disability Index

- Functional Rating Index
- Disabilities of the Arm Shoulder Hand (DASH)
- EPIC Function Hand Sort
- Patient-Rated Wrist Evaluation (PRWE)
- Lower Extremity Functional Scale (LEFS)

Under the fourth category, the following “Posture Assessment” methods were listed:

- Visual inspection/screening
- Leg length assessment
- Posturometer
- Photographs
- X-rays

The fifth category, ‘Ranges of Motion,’ involved the following assessment methods:

- Clinician/visual estimation
- Goniomet/mechanical inclinometer
- Cervical range of motion (CROM) device
- Back range of motion (BROM) device
- Single digital inclinometer
- Dual digital inclinometer

Neurological testing, the sixth category of measures, involved the following methods:

- Patient-reported pain referral pattern
- Sensory dermatomal testing
- Reflex testing
- Manual muscle testing
- Instrument-based muscle testing
- Surface electromyography (EMG)
- Thermography

The seventh and final category of methods involved ‘Psychosocial’ measures, of which the following four ascertainment methods were specifically asked about:

- Minnesota Multiphasic Personality Inventory (MMPI)
- Beck Depression Index II (BDI-II)
- Fear Avoidance Questionnaire
- Waddell’s behavioral signs

The respondents were instructed to indicate whether any or all of the listed examples of outcome measure in-

struments were *always, commonly, occasionally or never* used at the patient intake. This response was then compared to the utilization of the same outcome measure instruments during the course of treatment and the frequency of repeat testing was specified by choosing from one or more of the following response items: “each visit,” “every 9–12 visits” (approximately once a month during active treatment), “annually,” “when patient not responding,” “at dismissal,” or alternatively, “never.”

The survey focused on quantifying the rate of utilization of various outcome measures at the time of intake assessment and during the course of treatment. A blank space was provided so that survey participants could also characterize their use of other instruments not specifically listed in our survey. The questionnaire was kept short so the completion time would be approximately five minutes.

The survey was pilot-tested on 30 chiropractors registered and actively practicing in the province of British Columbia. Twenty-six responded without expressing any concerns about the length or overall acceptability of the survey and therefore no changes were made to the original survey. The responses of this sample group were not included in our study results.

The first group of Saskatchewan chiropractors who participated in completing the questionnaire were those attending a Workers’ Compensation Seminar. Two weeks later the survey was mailed out along with other information being disseminated by the Chiropractors’ Association of Saskatchewan. The responses were to be mailed or faxed to one of two provided addresses. The collected survey results were tabulated at a chiropractic office in Calgary, Alberta. To ensure the confidentiality of the respondents, survey participants were kept anonymous by blinding the participant tracking and tabulation members from each others data.

Results

Of the 164 registered chiropractors contacted in person or by a mail-out there were 62 (38%) respondents (Table 1).

Use of General Health Measures

Of the 62 respondents, 85% (n = 53) indicated that at the patient entry level they *always* performed a medical review, 10% performed a medical review *commonly* and 2% of the respondents *occasionally* performed a medical review. Another 2% of the respondents indicated that they

Table 1 *Compilation of survey results received from chiropractic practitioners (N = 62).*

Research Paper Survey Results for CMCC Rehabilitation Certification

Number of Responses = 62	At Intake						Frequency of repeating test							
	Always	Commonly	Occasionally	Never	Did Not Answer	Observed Totals	Each Visit	9-12 visits	Annually	No Response	Dismissal	Never	Other	Did Not Answer
General Health														
Medical Review	53	6	1	1	1	100%	2	19	28	11	1	2	2	7
SF36/12	0	0	5	37	20	100%	0	0	1	1	16	0	43	
Other	2	0	1	17	42	100%	0	0	0	0	1	8	1	52
Pain Scales														
Patient Description	55	3	0	1	3	100%	43	12	1	5	1	1	0	7
Visual Analogue	16	10	14	12	10	100%	8	14	3	9	0	7	1	23
Numerical Rating	25	12	13	5	7	100%	10	24	5	8	2	6	2	12
Pain Diagram	41	6	3	7	5	100%	2	8	12	7	2	11	1	22
Other	1	0	0	9	52	100%	1	0	0	0	0	5	0	56
Disability Index														
Low Back Revised Oswestry	0	8	26	23	5	100%	1	15	1	10	6	14	5	19
Roland-Morris	0	2	11	38	11	100%	0	4	0	5	5	15	3	34
Neck Disability Index (Vernon - Mior)	0	7	24	23	8	100%	0	12	1	8	5	14	5	25
Functional Rating Index	4	2	10	37	9	100%	0	3	1	8	4	15	3	33
DASH	0	0	8	43	11	100%	0	1	0	3	3	19	2	36
EPIC Function Hand Sort	0	0	2	48	12	100%	0	0	0	0	3	20	0	39
PRWE	0	0	1	49	12	100%	0	0	0	0	2	18	0	42
LEFS	0	0	1	49	12	100%	0	0	0	0	3	20	0	39
Other	0	0	1	19	42	100%	0	1	0	0	1	8	0	52
Postural														
Visual Screen	49	7	2	0	4	100%	33	15	4	3	0	0	2	8
Leg Length	24	17	12	3	6	100%	25	9	2	4	0	3	3	18
Posturometer	1	0	1	45	15	100%	1	0	0	1	1	25	0	35
Photographs	0	0	5	41	16	100%	0	1	1	1	1	26	0	32
X-Rays	0	14	39	2	7	100%	0	0	0	24	1	7	6	28
Other	0	0	0	5	57	100%	1	0	0	0	0	2	0	59
Ranges of Motion														
Clinician Estimate	50	9	1	0	2	100%	26	23	2	9	2	0	4	7
Goniometer	0	2	14	34	12	100%	0	2	0	0	0	19	3	38
CROM	4	1	6	35	16	100%	2	1	1	3	1	23	0	33
BROM	4	0	4	37	17	100%	2	1	1	3	1	22	0	34
Mechanical	0	2	3	44	13	100%	1	0	1	0	1	23	1	35
Single Digit	0	0	1	46	15	100%	0	0	1	0	0	23	0	38
Dual Digital	0	0	1	46	15	100%	0	0	1	0	0	23	0	38
Other	0	0	0	15	47	100%	0	0	0	0	0	8	0	54
Neurological														
Subjective Pain Referral	50	9	0	1	2	100%	48	6	1	4	0	1	0	8
Dermatome Testing	21	29	6	1	5	100%	4	26	4	15	0	0	2	15
Reflex Testing	33	19	4	1	5	100%	5	23	5	15	0	0	3	14
Muscle Testing (manual)	20	32	6	0	4	100%	9	26	1	12	0	0	2	13
Muscle Testing (instrumental)	0	3	5	39	15	100%	2	3	1	1	1	24	0	30
sEMG	0	3	2	41	16	100%	0	2	1	0	2	27	0	31
Thermography	0	3	1	41	17	100%	0	2	1	0	1	26	0	33
Other	1	1	0	9	51	100%	2	2	0	0	0	10	0	49
Psycho-social														
Minnesota Multiphasic Inventory	0	0	1	49	12	100%	0	1	0	1	1	28	0	32
Beck Depression Index - II	0	2	2	47	11	100%	0	1	0	2	0	26	0	33
Fear Avoidance Questionnaire	0	0	1	47	14	100%	0	0	0	1	0	27	0	34
Waddell's Behavioural Signs	4	9	12	30	7	100%	2	7	0	11	1	18	3	21
Other	3	2	2	15	40	100%	2	1	1	2	0	9	1	46

never performed a medical review at the patient entry level. In regard to the frequency at which a medical review is repeated 45% (n = 28) indicated that it was done annually (n = 19), 31% indicated they repeated a medical review after 9–12 visits and 18% (n = 11) repeated a medical review if there was no favorable response to treatment.

The SF 36/12 health status questionnaire was utilized

occasionally by 8% (n = 5) of the respondents. None of the 62 respondents indicated that they always or commonly used the SF 36/12 health status questionnaires. Two respondents of the 62 (3%) indicated that they utilized some other method to assess a patient's general health.

Use of Pain Scales

At patient entry, the patient's own pain description was

the most utilized assessment method that was *always* recorded by the practitioner 89% (n = 55). The pain diagram was *always* used by 66% (n = 41) of the respondents and numerical rating was *always* utilized by 40% (n = 25). A visual analogue scale was used in an ongoing manner by 25% (n = 16) of the 62 respondents. The numerical rating pain scale was the second-most commonly “always” used measure over the course of treatment, again after the patient’s own description.

Use of Disability Indexes

The percentages of respondents who *Never* utilized each of these disability indices are as follows: Low Back Revised Oswestry: 37%; Roland Morris Questionnaire: 61%; Neck Disability Index: 37%; Functional Rating Index: 60%; Disabilities of the Arm Shoulder Hand (DASH): 68%; EPIC Function Hand Sort: 77%; Patient-Rated Wrist Evaluation (PRWE): 79%; and the Lower Extremity Functional Scale (LEFS): 79%.

The only disability index that any of the respondents used *always* at entry level was the Functional Rating Index, however even then, only four out of the 62 respondents (6.5%) indicated that they used this particular instrument so frequently. No other disability indices were routinely utilized at entry level. The Low Back Revised Oswestry and the Neck Disability Index were the two indices that were employed to the greatest extent either *commonly* or *occasionally* at patient intake. The Roland-Morris and Functional Rating Index were utilized *commonly* by only 3% of the respondents and *occasionally* by 17% of the respondents at patient intake.

During the course of treatment the Low Back Revised Oswestry and the Neck Disability Index were again utilized to the greatest extent. These two disability indices were mostly used after 9 to 12 visits. They were less commonly used when there was *no response* to treatment and they were employed the least at *dismissal* or discharge. For many of the disability indexes, more than 25% of respondents indicated that they *never* used them during the course of subsequent treatment.

Use of Posture Assessment

At the patient intake entry level 79% of the respondents indicated that they *always* documented the findings of a visual screen assessment of the patient’s posture, and 39% (n = 24) indicated that they *always* documented leg length

differences. Also at the entry level, X-rays were *commonly* utilized by 22% of the respondents and *occasionally* by 63%. Seventy percent of the respondents indicated that they *never* used either a posturometer or took photographs at the intake entry level.

At each visit during the course of treatment visual screening of the patient’s posture was monitored by 53% of the respondents and leg length differences was monitored by 40% of the respondents. When there was *no response* to treatment, 39% (n = 24) of the practitioners indicated that they utilized X-rays.

Use of Ranges of Motion Assessment

At the patient intake examination, visual estimation was used to assess ranges of motion *always* by 81%, *commonly* by 15% and *occasionally* by 2% of respondents. In contrast, a goniometer or mechanical inclinometer was used only *occasionally* by 23% (n = 14) of respondents at the initial patient intake. Spinal range of motion devices (CROM and BROM) were used *occasionally* by less than 10% of respondents.

Over the course of subsequent treatment visual estimation of ranges of motion was utilized far more than any other method. Twenty-six of the 62 respondents (42%) used this method during each visit and 37% reevaluated ranges of motion visually later in the course of treatment (after 9 to 12 visits). Although the CROM, BROM and digital inclinometer are quite accurate in documenting changes in ranges of motion, they were rarely utilized by this group of practitioners.

Use of Neurological Testing

The vast majority of respondents performed a complete neurological assessment routinely at the patient intake. The actual percentages of respondents who either *always* or *commonly* utilized each assessment measure are as follows: patient-reported pain referral pattern: 95%; dermatomal testing: 86%; reflex testing: 83%; and manual muscle testing: 84%.

Instrument-based muscle testing, surface EMG and thermography were utilized *commonly* by only 5% of the respondents at the time of patient intake. A slightly larger percentage of respondents (8%) *occasionally* utilized instrumental muscle testing at intake.

Forty-eight of the sixty-two respondents (77%) recorded the subjective pain referral pattern as stated by the pa-

tient at each visit. Dermatome testing, reflex testing and manual muscle testing were *usually* performed (by 40% of respondents) after 9 to 12 visits. Approximately 23% of respondents indicated that they employed these same three neurological evaluations if there was *no response* to their care. A small percentage (4%) of respondents utilized either instrumental muscle testing, surface EMG or thermography after 9 to 12 visits.

Use of Psychosocial Measures

Overall, chiropractors seldom used instruments in this category. More than 75% of respondents indicated that they *never* used the MMPI, BDI-II or Fear Avoidance Questionnaire during intake assessments. Waddell's behavioral signs was the only specifically listed tool that was used at intake (either *always or commonly* by 21.4% and *occasionally* by 19%), and also the most frequently used measure in this category when patients subsequently exhibited *no response* to treatment (18%).

Discussion

We attempted to inquire about a broad spectrum of outcomes or clinical tests that chiropractors are utilizing in everyday practice. It was beyond the scope of this study to assess the actual clinical usefulness of such instruments as our primary focus was to describe patterns of utilization of the various measures. We also sought to explore how chiropractors assessed the baseline intake status of their patients as well as how they subsequently gauged changes in this baseline status during subsequent management.

This study also revealed that pain scales were routinely used by chiropractors at patient intake and throughout the course of subsequent care. The three most valid and accepted pain scales – the visual analogue scale, numerical rating scale and the pain diagram – were commonly used. Even so, the patient's subjective verbal description of pain was still the most widely used method of documenting the patient's status. While pain scales are a sensitive outcome measure of changes in pain intensity, chiropractors still often require ongoing information as to the pain location, radiation and quality. Pain is largely subjective and is perceived and interpreted differently by each individual patient, in which case, suffering due to pain is as much an emotional experience as it is a physical experience. A major limitation with unstructured patient self-reports as

well as structured pain intensity scales is that they inadequately characterize pain *behavior* or the psychological responses to pain.¹¹ Therefore, although chiropractors appear to favour the use of pain scales and the patient's verbal descriptions of pain to document treatment response, such approaches should be combined with the use of condition-specific as well as general health status questionnaires.⁴

This study revealed that condition-specific disability indices such as the Low Back Revised Oswestry and the Neck Disability Index are being utilized only occasionally (by less than half of the respondents). The majority (60%) indicated that these indices are never used at the patient intake entry level in their practices. Usage of the general health questionnaire such as the SF 36 and condition-specific disability indices would complete the battery of self-reporting instruments that paint a holistic portrait of a patient.²² Yet, the results of this study show that even though the majority of respondents reportedly performed a general health medical review during an initial consultation, neither the SF-36 nor SF-12 general health status questionnaires were utilized by any of our respondents.

General health status questionnaires are designed to measure the impact of health conditions in general on a patient's quality of life.²² They are intentionally broad in scope so that they can be used to assess patients with virtually any health complaint. They are potentially valuable tools for everyday practice as they can provide practitioners with insights into a patient's general health perceptions as well as the limitations of health conditions on both physical and social functioning.²²

The SF 36 is a short form general health questionnaire that consists of 36 questions that measure eight health attributes. Upon completion by the patient, the clinician scores the responses to each of the eight health sections and a numerical value is assigned. By repeating the SF 36 general health questionnaire at a subsequent timepoints, changes in baseline status can be validly obtained. While not completely interchangeable with the SF-36, the SF 12 is similar in scope to the SF-36, but utilizes only 12 of the original questionnaire items with the aim of reducing the burden of completion and assessment on respondents and investigators, respectively.

The Saskatchewan Workers' Compensation Board has subsequent to and independent from this study initiated a policy requiring that, for *full* payment of fees for initial re-

ports and progress reports (on every sixth visit) an injury area-specific disability index be completed. The disability indexes which they have chosen are the Roland Morris Questionnaire, Neck Disability Index, Disabilities of the Arm Shoulder and Hand (DASH) Questionnaire, and the Lower Extremity Functional Scale (LEFS). A logical subsequent study will be to determine if utilization of these indexes increases among Saskatchewan chiropractors as a result of this new financial incentive. A comparison of the frequency of their use for workers' compensation claimants versus non-workers' compensation beneficiaries would also be of interest.

The monitoring of the patient's functional neurological status was consistently performed by the majority of the respondents at the initial examination and again throughout the course of treatment. The routine "low technology" neurological evaluation consisting of deep tendon reflexes, manual muscle strength testing, dermatomal pinwheel testing and light touch perception is taught as a fundamental standard of chiropractic practice. The results from this survey suggest that this conclusion is shared by the majority of respondents. More technologically advanced equipment such as surface EMG and thermograph had relatively low utilization by these respondents.

The assessment of a patient's posture and the visualization of their full spines on a radiograph have mesmerized many chiropractors for the past century. Despite little clinical relevance between spinal pain and many structural variants, including leg length differences, such parameters were commonly monitored by respondents. The visual inspection of a patient's posture when viewed in the context of muscular dysfunctions accords well with the work originated by Alois Brugger and Vladamir Janda, both of whom were European-trained neurologists with keen interests in posture and gait and the effects of CNS central motor regulation on static posture and locomotion.^{23,24} Ideal erect posture (sagittal plane function) requires the well balanced muscular co-activation of all the deep "intrinsic" stabilizers acting as a functional unit to achieve optimal loading of the spine (Sherrington's law of reciprocal inhibition). A strictly localized dysfunction does not exist in isolation of its ramifications on the tonic postural muscles that stabilize the spine as a whole and the phasic muscles producing motion. An abnormality of the spine in the sagittal plane reflects faulty CNS control of the tonic postural muscles, which has adverse conse-

quences on the phasic muscles that generate all peripheral movement patterns.²⁴

The clinician's visual estimation of range of motion at the patient intake level and throughout the course of treatment was the method most favored by the respondents to this survey. Despite the fact that this method has poor reliability and validity as an outcome measure, it remains the most utilized approach, probably because of its simplicity and ease of use. The visual estimation of range of motion is adequate if the intent is to test for pain generation or gross asymmetry in regional movements. The chiropractor then garners information as to the location and quality of pain associated with certain movements, especially if there is a painful arc or pain only at end-range. However, measurement devices are required to perform an accurate assessment of range of motion when it pertains to reliably documenting improvement, rating permanent impairment or determining a plateau in healing. The trend shown from the current study is that measurement devices to assess ranges of motion are not routinely used by the chiropractors.

Our survey did not address the respondent's perceptions as to the clinical relevance of their observations. There still exists a trend to continually monitor leg length differences and perform some sort of a visual postural screen assessment during each visit.

Most respondents (75%) indicated that they never use any of the listed psycho-social outcome measures. Waddell's Behavioral Signs was practically the only tool in this category that chiropractors used (18%). There are eight tests that make up the five Waddell signs. Traditionally, the presence of three of five of these signs is interpreted to reflect the presence of non-organic pain. However results from a relatively recent systematic review of the relevant literature suggest that the association between Waddell's signs and outright malingering (and secondary gain) are inconclusive.²⁵ In the meantime, anecdotally at least, Waddell signs are commonly utilized in the compensation setting.

The Fear-Avoidance Beliefs Questionnaire (FABQ), which was developed by Waddell, also depicts patient's fears about pain and work, and about pain and physical activity. As a single factor, 'fear-avoidance beliefs' appear to best predict the patient's willingness to partake in any form of active care.^{26,27} The fear of pain becomes cyclic where activity avoidance leads to further de-conditioning and later on to chronic sensitization, which in turn reinfor-

ces the notion that pain equates to harm and additional tissue damage.^{27,28} The detrimental effect of fear avoidance on patient activity can be substantial and therefore this instrument could be very useful in assisting chiropractors to identify, monitor, and appropriately manage workers with legitimate non-physical return-to-work barriers.

The Beck Depression Index (BDI) is advocated only as a screening (rather than diagnostic) tool for underlying depression. Among respondents in this study, it was not a routinely administered questionnaire at the initial consultation. The BDI contains questions concerning very sensitive and personal issues. For this reason alone, it should only be administered when an attending chiropractor has gained an appropriate level of trust from the patient. It is beyond the scope of a chiropractor to establish a diagnosis of depression from the simple administration of the BDI. Again, this inventory is only meant to be a screening tool intended to facilitate discussion between patients and their chiropractor about possible depression and, if necessary, prompt a referral to a mental health professional that will then more accurately assess the patient's condition.^{5,29} Ultimately, by being cognizant of the potential influences of psychosocial dysfunction chiropractors can modify their clinical approach to reduce the impact of such factors on their treatment outcomes.

The Minnesota Multiphasic Personality Inventory (MMPI) is one of the most widely used assessment tools at pain clinics specializing in the treatment of chronic pain. In its full length there are 566 true/false items and it can take up to 1 to 2 hours to complete. There is a shorter version of the 168 items however interpretation of either MMPI should be done by someone well trained in a mental health discipline and with specific training in the administration and scoring of the MMPI.³⁰ This being the case, we were not surprised to find that all but one respondent indicated not using this instrument in any capacity in his/her practice.

Study Limitations

Unfortunately, even though we attempted to minimize selection bias by polling an entire provincial practitioner population, this survey may reflect an unintentional responder bias in that 164 chiropractors were eligible but only 62 (38%) returned the questionnaires in the allotted time. These respondents may be those with a passing interest in the topic of outcome measures and are therefore

unlikely to constitute a representative cross-section of the chiropractic profession in the province of Saskatchewan, let alone across Canada as a whole. Furthermore, as we neglected to collect specific demographic and practice pattern data from respondents, we were unable to determine whether utilization of specific questionnaires was associated with factors such as the presence or absence of university-affiliated or multidisciplinary-based practice, underlying chiropractic philosophical orientation, preferred technique (e.g. activator).

A further bias is possible in the design of the questionnaire itself. We felt that the time commitment for the respondents needed to be minimal but also that the questionnaire should inquire about a relatively comprehensive spectrum of instruments. The final form included inquiries regarding patient reported information (2 items [medical review being a substantial undertaking]), clinician assessments (7 items), pen and paper instruments (12 items), device instrumentation (13 items) and allowances for "other" entries to be specified by respondents themselves (although this option was seldom selected and perhaps under utilized). These factors notwithstanding, all authors/investigators for this study were rehabilitation fellows, and therefore our choice of – and interest in – particular instruments to inquire about may have been influenced by our specialty education and/or related clinical experience.

Given our low response rate, our study results do not necessarily represent the prevailing attitudes of the chiropractic profession in the province of Saskatchewan, let alone the rest of Canada.

Conclusions

This study was able to determine general trends in the utilization of outcome measures by the survey respondents in their daily chiropractic practices. There is a trend that self reporting pain scales are routinely being performed at patient intake and during the course of treatment. On the other hand, the well known Oswestry Disability, Roland Morris, and Neck Disability Indices are not routinely performed by chiropractors at patient entry level. Similarly, a trend is seen in the lack of use of psychosocial outcome measures by chiropractors. Greater utilization of back pain specific disability indices is encouraged among chiropractors to improve both the monitoring and documentation of patients' responses to care. Similarly, greater utilization of psychosocial measures is encouraged to im-

prove awareness of underlying conditions representing a substantial barrier to recovery and/or warranting a referral to another health care provider.^{4,11}

Measures conducted most routinely by chiropractors during subsequent treatment are the neurological examination and range of motion assessment. The latter is usually performed only visually and not reliably by means of a goniometer or equivalent device. Similarly, visual assessments of posture and leg length are routinely conducted despite the lack of validity of their use in everyday practice.

The recently released CCA guidelines regarding the patient centered practice (Section 5) note that “Ongoing treatment of a patient should be based on clinical findings and consideration of objective and subjective improvement. The absence of re-assessment renders long term projections of care as conjecture.” While our study is not necessarily generalizable to the chiropractic membership at large in Saskatchewan or other Canadian provinces, our results suggest that chiropractors may not be doing a particularly exemplary job of incorporating objective outcome assessment measures into everyday practice. A broader survey with more representative sampling of members throughout Canada would be an informative follow-up to this study. In the meantime, we are inclined to recommend greater education on and promotion of the use of more objective assessment methods throughout the profession.

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Appendix 1. Survey given to chiropractic practitioners in Saskatchewan.

Approximate time to do survey: 5 minutes

In the view that the evolving practice of chiropractic is moving in the direction of “evidence based” care and/or “best practice” delivery, this survey is being conducted to determine which outcome measures practitioners utilize to determine entry, baseline health status of patients, and to gauge changes from this baseline. The list provides some of the most common instruments but is by no means exhaustive.

Please note all answers will be blinded and absolutely confidential.

Most commonly, and where applicable, I use the following instruments;

	<u>At Intake</u>				<u>Frequency of repeating test</u> - check all that apply						
	Always	Commonly	Occasionally	Never	Each Visit	9-12 visits (~monthly)	Annually	Not Responding	Dismissal	Never	Other
GENERAL HEALTH											
Medical Review	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
SF36/12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
PAIN SCALES											
Patient Description	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Visual Analogue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Numerical Rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Pain Diagram	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Appendix 1 Continued.

DISABILITY INDEX	Always	Commonly	Occasionally	Never	Each Visit	9-12 visits (~monthly)	Annually	Not Responding	Dismissal	Never	Other
Low Back Revised Oswestry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Roland-Morris	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Neck Disability Index (Vernon-Mior)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Functional Rating Index	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
DASH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
EPIC Function Hand Sort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
PRWE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
LEFS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
POSTURAL	Always	Commonly	Occasionally	Never	Each Visit	9-12 visits (~monthly)	Annually	Not Responding	Dismissal	Never	Other
Visual Screen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Leg Length	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Posturometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Photographs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
X-Ray	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
RANGES OF MOTION	Always	Commonly	Occasionally	Never	Each Visit	9-12 visits (~monthly)	Annually	Not Responding	Dismissal	Never	Other
Clinician Estimate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Goniometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
CROM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
BROM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Mechanical Inclometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Single Digital Inclometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Double Digital Inclometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Appendix 1 Concluded.

	NEUROLOGICAL				Each Visit	9-12 visits (~monthly)	Annually	Not Responding	Dismissal	Never	Other
	Always	Commonly	Occasionally	Never							
Subjective Pain Referral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Dermatome Testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Reflex Testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Muscle Testing (manual)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Muscle Testing (instrument)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
sEMG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Thermography	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	PSYCHO-SOCIAL										
	Always	Commonly	Occasionally	Never	Each Visit	9-12 visits (~monthly)	Annually	Not Responding	Dismissal	Never	Other
Minnesota Multiphasic Inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Beck Depression Index - II	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fear Avoidance Questionnaire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Waddell's Behavioral Signs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____