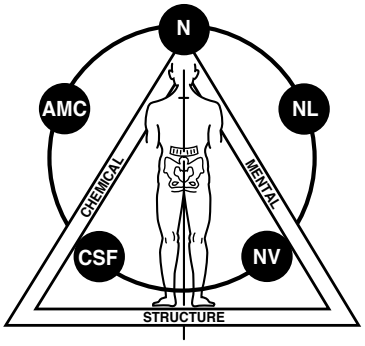
International College of Applied Kinesiology®-U.S.A.

Experimental Observations of Members of the ICAK

Volume I, 2004 – 2005

Proceedings of the Annual Meeting



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Experimental Observations of Members of the ICAK

Volume I, 2004 – 2005

Proceedings of the Annual Meeting

Presented

June 10 – 13, 2004

Jersey City, NJ

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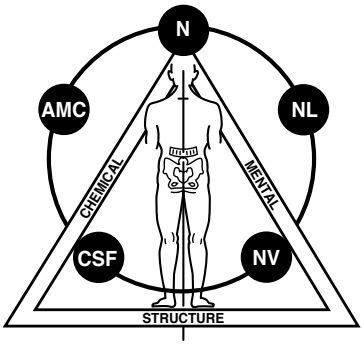

Message From the Chairman

David Leaf, D.C., DIBAK

For 28 years, the members of the International College of Applied Kinesiology®-U.S.A. have shared their insights, outcomes, case histories and research through the papers presented in the *Proceedings*. The ICAK-U.S.A. continues to thrive as an "Arena of Ideas" through which members have the opportunity to present their observations and research results. These published works document the first steps toward the furtherance and development of the authors' hypotheses, concepts and procedural techniques which can culminate in their material becoming part of the accepted body of knowledge we know as applied kinesiology. We invite all members to participate in this endeavor in the future.

Past history shows that the observations of one doctor stimulate the minds of others and the end result can be, as Dr. Goodheart credits Dr. Deal as saying, "and now we have another piece of the puzzle."

I am pleased to again have the opportunity to read and share with the members the advances and successes of this year.

Thank you and congratulations to all of our contributors. And a special thanks to Drs. Rebecca Hartle, David Engel, Jan Calhoon, Allan Zatkin and Denise Natale for all of their help during the review process. We look forward to seeing you at the Annual Meeting, June 10-13, 2004 in Jersey City, NJ.

Introduction

This forty-sixth collection of papers from members of the International College of Applied Kinesiology®-U.S.A. contains 32 papers (including 8 case histories) by 16 authors. The authors welcome comments and further ideas on their findings. You may talk with them at the meeting or write them directly; addresses are given in the Table of Contents.

The manuscripts are published by ICAK-U.S.A. as presented by the authors. There has been no effort to edit them in any way; however, they have been reviewed by the *Proceedings* Review Team for originality and to determine that they follow the "Instructions to Authors" published by the ICAK-U.S.A. The primary purpose of the ICAK-U.S.A. in publishing the *Proceedings* is to provide an interchange of ideas to stimulate improved examination and therapeutic methods in applied kinesiology.

It should be understood that the procedures presented in these papers are not to be construed as a single method of diagnosis or treatment. The ICAK-U.S.A. expects applied kinesiology to be used by physicians licensed to be primary health care providers as an adjunct to their standard methods of diagnosis and treatment.

There are three divisions of the *Proceedings* of the Annual Meeting of the International College of Applied Kinesiology®-U.S.A. Division I consists of papers for members' information. Division II contains papers inviting constructive comments to be published in future editions of the *Proceedings*. Division III is for constructive comments on papers published in Division II and for subjects that might be included in "Letters to the Editor" of a refereed journal. Papers will be put in Division I or II at the author's request. It is expected that authors will choose Division I for papers such as anecdotal case studies, thought-provoking new ideas that have not been researched, and other types of papers that are for the membership's general information. It is expected that Division II will include papers that have a research design, or those the author has thoroughly studied and worked with and believes to be a viable approach of examination and/or treatment. Studies to test methods developed by others, often called validation studies, fit well here. This area also lends itself to editorial-type comments about the practice of applied kinesiology and its procedures. Division III is somewhat similar to the "Letters to the Editor" section of refereed journals. It provides a forum for members to comment on research design or other factors in papers previously presented. Its purpose is for us to improve the quality of our presentations and, in some cases, to provide rebuttal to presented material. Comments on papers will only be published in this area if the paper was presented in Division II inviting constructive criticism.

Neither the International College of Applied Kinesiology®-U.S.A., its Executive Board, nor the membership, nor the International Board of Examiners, International College of Applied Kinesiology, necessarily endorses, approves of, or vouches for the originality or authenticity of any statements of fact or opinion in these papers. The opinions and positions stated are those of the authors and not by act of publication necessarily those of the International College of Applied Kinesiology®-U.S.A., the Executive Board or membership of the International College of Applied Kinesiology®-U.S.A., or the International Board of Examiners, International College of Applied Kinesiology.

Instructions to Authors Proceedings of the ICAK-U.S.A.

Manuscripts are reviewed for format, technical content, originality, and quality for reproduction. There is no review for authenticity of material.

The ICAK-U.S.A. recognizes that the usual procedure for selection of papers in the scientific community is a blind review. However, the purpose of *The Proceedings of the ICAK-U.S.A.* is to stimulate creative thinking and critical review among its members. These papers are distributed only to the members of the ICAK-U.S.A. for general evaluation, and for the members to put into perspective the validity of the described approaches. The purpose is to put before the membership primary observations that may lead to scientific investigations, new areas of research, and in-depth study, inspiring progress in the field of applied kinesiology.

Statements and opinions expressed in the articles and communications in *The Proceedings of the ICAK-U.S.A.* are those of the author(s); the editor(s) and the ICAK-U.S.A. disclaim any responsibility or liability for such material.

The current ICAK-U.S.A. Status Statement is published with *The Proceedings of the ICAK-U.S.A.* It is recommended that procedures presented in papers conform to the Status Statement; papers that do not will be published and identified in the table of contents as failing to conform. It is recommended that examination or treatment procedures that fail to conform to the ICAK-U.S.A. Status Statement be supported by statistical studies, literary references, and/or any other data supporting the procedure.

Papers are published in three divisions: I) papers intended by the author as informative to the membership and not inviting critical review. II) papers inviting critical and constructive comments from the membership in order to improve the total value of the paper. Comments may be made on such items as research design, methods presented, clarity of presentation, and practical use in a clinical setting. The author must include with his/her paper written indication of desire for the paper to be included in the section inviting critical review or for informative purposes. III) The third section is for review comments on papers published in Division II. These papers are for constructive review. Opinions or editorials with negative connotations only may be rejected.

Manuscripts are accepted by the ICAK-U.S.A. for consideration to publish with the understanding that they represent original unpublished work. Acceptance of the manuscript by the ICAK-U.S.A. does not necessarily imply acceptance for publishing. The author may appeal any paper rejected to a committee composed of members of the Publications and Research Advisory Committees. The decision of this committee on publishing the paper will be final.

The paper must be an original work and deal specifically with applied kinesiology examination and/or treatment techniques. Various techniques may be discussed if they are correlated with applied kinesiology manual muscle testing examination.

All manuscripts (meaning any material submitted for consideration to publish) must be accompanied by a properly completed *RELEASE FORM*, signed by all authors and by employer if submission represents a "work for hire." Upon such submission, it is to be accepted by all authors that no further dissemination of any part of the material contained in the manuscript is permitted, in any manner, without prior approval from the editor; nonobservance of this copyright holder stipulation may result in withdrawal of submission for consideration to publish.

Continuing call for papers includes:

Research Studies (Investigations)—reports of new research findings into the enhancement factors of health, causal aspects of disease, and the establishment of clinical efficacies of related diagnostic and therapeutic procedures.

Hypotheses—preliminary studies that may establish a solid basis for further in-depth investigations.

Literature reviews—critical assessments of current knowledge of a particular subject of interest, with emphasis on better correlation, the pointing up of ambiguities, and the delineation of areas that may constitute hypotheses for further study. Meta-analysis is included here.

Clinical procedures—succinct, informative, didactic papers on diagnostic and therapeutic procedures, based heavily on authoritative current knowledge.

Case reports—accounts of the diagnosis and treatment of unusual, difficult, or otherwise interesting cases that may have independent educational value or may contribute to better standardization of care for a particular health problem when correlated with similar reports of others.

Case reviews—a retrospective comparative assessment of the diagnosis and treatment of several cases of a similar condition, ie, the comparative evaluation of two or more (perhaps hundreds) of case reports.

Clinical Observations (Technical reports)—the reporting and evaluation of new or improved equipment or procedures, or the critical evaluation of old equipment or procedures that have not previously been critically evaluated.

Commentary—editorial-like, more in-depth essays on matters relating to the clinical, professional, educational, and/or politicolegal aspects of health care principles and practice.

Critical Review (Letters to the editor)—communications that are directed specifically to the editor that critically assess some aspect of the ICAK, particularly as such assessment may add to, clarify, or point up a deficiency in a recently published paper; authors are afforded the privilege of a counter-response.

The following editorial policies will apply:

Informed consent—Manuscripts that report the results of experimental investigations with human subjects must include a statement that informed consent was obtained, in writing, from the subject or legal guardian, after the procedure(s) had been fully explained.

Patient anonymity—Ethical and legal considerations require careful attention to the protection of the patient's anonymity in case reports and elsewhere. Identifying information such as names, initials, actual case numbers, and specific dates must be avoided; identifying information about a patient's personal history and characteristics should be disguised. Photographs or artistic likenesses of subjects are publishable only with their written consent or the consent of legal guardian; the signed consent form, giving any special conditions (ie, eyes blocked off), must accompany manuscript.

Authorship—All authors of papers submitted to ICAK-U.S.A. must have an intellectual stake in the material presented for publication. All must be willing to answer for the content of the work. Authors should be willing to certify participation in the work, vouch for its validity, acknowledge reviewing and approving the final version of the paper, acknowledge that the work has not been previously published elsewhere, and be able to produce raw data if requested.

Conflict of Interest—In recognition that it may at times be difficult to judge material from authors where proprietary interests are concerned, authors should be ready to answer requests from the editor regarding

potential conflicts of interest. The editor makes the final determination concerning the extent of information released to the public.

Acknowledgments—Illustrations from other publications must be submitted with written approval from the publisher (and author if required) and must be appropriately acknowledged in the manuscript.

Author responsibility—Manuscripts accepted for publication are subject to such editorial modification and revision as may be necessary to ensure clarity, conciseness, correct usage, and conformance to approved style. However, insofar as authors are responsible for all information contained in their published work, they will be consulted if substantive changes are required and will have further opportunity to make any necessary corrections on the proofs.

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Manuscript preparation

Authors are encouraged to submit final manuscripts on computer diskette along with the printed revised copy. Authors accept responsibility for the submitted diskette exactly matching the printout of the final version of the manuscript. Manuscripts produced on IBM or compatible computers are preferred. Macintosh files should not be saved using the Fast Save option. Identify the diskette with journal name, manuscript number, name of first author, manuscript title, name of manuscript file, type of hardware, operating system and version number, and software and version number. Each article should be on a separate diskette. Please put all manuscript parts (text, references and figure legends) in one file.

The ICAK-U.S.A. does not assume responsibility for errors in conversion of customized software, newly released software and special characters. Mathematics and tabular material will be processed in the traditional manner.

Approved manuscript style

Manuscripts submitted for consideration to publish in *The Proceedings of the ICAK-U.S.A.* must be compiled in accordance with the following instructions, and manuscripts not so compiled are subject to return to the author for revision.

Summary of requirements

Type the manuscript double-spaced, including title page, abstract, text, acknowledgments, references, tables, and figure legends. (Note: footnotes should be avoided by including any necessary explanatory information within the text in parentheses). Do not break any words (hyphenate) at the end of any line; move to the next line if entire word does not fit.

Each manuscript component should begin on a new page, in the following sequence:

- Title page (page 1)
- Abstract and key word page (page 2)
- Text pages (starting on page 3)
- Acknowledgment page

- Reference page(s)
- Table page(s)
- Legends for illustrations pages(s).

Detailed preparation procedure

Begin each of the following sections on separate pages: title (including author name[s], address and phone number of principal author, running head, etc), abstract and key words, text, acknowledgments, references, individual tables, and figure legends.

Units of Measurement—In most countries the International System of Units (SI) is standard, or is becoming so, and bioscientific journals in general are in the process of requiring the reporting of data in these metric units. However, insofar as this practice is not yet universal, particularly in the United States, it is permissible for the time being to report data in the units in which calculations were originally made, followed by the opposite unit equivalents in parentheses; ie, English units (SI units) or SI units (English units). Nevertheless, researchers and authors considering submission of manuscripts to the ICAK-U.S.A. should begin to adopt SI as their primary system of measurement as quickly as it is feasible.

Abbreviations and symbols—Use only standard abbreviations for units of measurement, statistical terms, biological references, journal names, etc. Avoid abbreviations in titles and abstracts. The full term for which an abbreviation stands should precede its first use in the manuscript, unless it is a standard unit of measurement.

Title page

The title page should carry (1) the title of the article, which should be concise but informative; (2) a short running head or footline of no more than 40 characters (count letters and spaces) placed at the foot of the title page and identified; (3) first name, middle initial, and last name of each author, with highest academic degree(s); (4) names of department(s) and institution(s) to which work should be attributed; (5) disclaimers, if any; (6) name, address, phone, and fax number of author responsible for correspondence, proofreading of galleys, and reprint requests (usually principal author); (7) the source(s) of support in the form of grants, equipment, drugs, or all of these.

Abstract and key word page

The second page should carry an abstract of no more than 150 words, 250 if using a structured abstract. The structured abstract is now required for all original data reports, reviews of the literature and case reports; prose abstracts will be accepted for use in only certain original papers not reporting data (ie, position papers, historical treatises).

Below the abstract, provide, and identify as such, 3 to 10 key indexing terms or short phrases that will assist indexers in cross-indexing your article and that may be published with the abstract. Use terms from the Index Medicus Medical Subject Headings (MeSH) as much as possible.

Text pages

The text of observational and experimental articles is usually—but not necessarily—divided into sections with the headings Introduction, Materials and Methods, Results, Discussion, and Conclusions. Long articles may need subheadings within some sections to clarify or break up content. Other types of articles such as case reports, reviews, editorials, and commentaries may need other formats.

Introduction

Clearly state the purpose of the article. Summarize the rationale for the study or observation. Give only strictly pertinent references and do not review the subject extensively; the introduction should serve only to introduce what was done and why it was done.

Materials and methods

Describe your selection of the observational or experimental subjects (patients or experimental animals, including controls) clearly. Identify the methods, apparatus (manufacturer's name and address in parentheses) and procedures in sufficient detail to allow others to reproduce the work for comparison of results. Give references to establish methods, provide references and brief descriptions for methods that have been published but may not be well known, describe new or substantially modified methods and give reasons for using them and evaluate their limitations.

When reporting experiments on or with human subjects, indicate whether the procedures used were in accordance with the ethical standards of the Committee on Human Experimentation of the institution in which the research was conducted and/or were done in accordance with the Helsinki Declaration of 1975. When reporting experiments on animals, indicate whether the institution's or the National Research Council's guide for the care and use of laboratory animals was followed. Identify precisely all drugs and chemicals used, including generic name(s), dosage(s), and route(s) of administration. Do not use patient names, initials, or hospital numbers or in any manner give information by which the individuals can be identified.

Include numbers of observations and the statistical significance of the findings when appropriate. Detailed statistical analyses, mathematical derivations, and the like may sometimes be suitably presented in the form of one or more appendixes.

Results

Present your results in logical sequence in the text, tables, and illustrations. Do not repeat in the text all the data in the tables, illustrations, or both; emphasize or summarize only important observations.

Discussion

Emphasize the new and important aspects of the study and conclusions that follow from them. Do not repeat in detail data given in the Results section. Include in the Discussion the implications of the findings and their limitations and relate the observations to other relevant studies. Conclusions that may be drawn from the study may be included in this discussion section; however, in some cases, they may be more succinctly presented in a separate section.

Conclusions

The principal conclusions should be directly linked to the goals of the study. Unqualified statements and conclusions not completely supported by your data should be avoided. Avoid claiming priority and alluding to work that has not been completed. State new hypotheses when warranted but clearly label them as such. Recommendations (for further study, etc), when appropriate, may be included.

Acknowledgments

Acknowledge only persons who have made substantive contributions to the study itself; this would ordinarily include support personnel such as statistical or manuscript review consultants, but not subjects used in the study or clerical staff. Authors are responsible for obtaining written permission from persons being acknowledged by name because readers may infer their endorsement of the data and conclusions.

Reference pages

References are to be numbered consecutively as they are first used in the text (placed in line in parentheses) and listed in that order (not alphabetically) beginning on a separate sheet following the text pages. The style (including abbreviation of journal names) must be in accordance with that specified by the US National Library of Medicine: see recent January issue of Index Medicus for a complete listing of indexed journals.

Only those references that actually provide support for a particular statement in the text, tables, and/or figures should be used. Excessive use of references should be avoided; normally, 1 or 2 authoritative references to support a particular point are sufficient. A short article of up to 5 or 6 manuscript pages may be adequately supported by 5 to 10 references; longer articles of up to 20 pages by 15 to 25.

References must be verified by the author(s) against the original document. Abstracts, "unpublished observations" and "personal communications" may not be used as references, although reference to written (not verbal) communications may be inserted (in parentheses) in the text. Information from manuscripts submitted but not yet accepted may be referred to (in parentheses) in the text. Manuscripts accepted but not yet published may be included in the references with the designation "In press." When a previously cited reference is used again, it is designated in the text (in parentheses) by the number originally assigned to it by its first use: do not assign it another number or again list it in the references as "op cit."

For the most part, sources of information and reference support for a bioscientific paper should be limited to journals (rather than books) because that knowledge is generally considered more recent and (in the case of refereed journals) more accurate. Consequently, the basic form for approved reference style is established by journal listings; others (books, etc) are modified from journal listings as may be required. A summary of journal reference style is as follows:

Last name of author(s) and their initials in capitals separated by a space with a comma separating each author. (List all authors when 6 or fewer; when 7 or more, list only the first 6 and add et al.)

Title of article with first word capitalized and all other words in lower case, except names of persons, places, etc.

Name of journal, abbreviated according to Index Medicus; year of publication (followed by a semicolon); volume number (followed by a colon); and inclusive pages of article (with redundant number dropped, ie, 105-10).

Specific examples of correct reference form for journals and their modifications to other publications are as follows:

Journals

1. Standard article You CH, Lee KY, Chey RY, Menguy R. Electrogastrographic study of patients with unexplained nausea, bloating and vomiting. Gastroenterology 1980;79:311-4.
2. Corporate author The Royal Marsden Hospital Bone-Marrow Transplantation Team. Failure of synergeneic bone-marrow graft without preconditioning in post-hepatitis marrow aplasia. Lancet 1977;2:242-4.
3. No author given Coffee drinking and cancer of the pancreas [editorial]. Br Med J 1981;283:628.
4. Journal supplement Magni F. Rossoni G, Berti F. BN-52021 protects guinea-pig from heart anaphylaxis. Pharmacol Res Commun 1988;20 Suppl 5:75-8.
5. Journal paginated by issue rather than volume Seaman WB. The case of pancreatic pseudocyst. Hosp Pract 1981;16(Sep):24-5.

Books and other monographs

6. Personal author(s) Eisen HN. Immunology: an introduction to molecular and cellular principles of the immune response. 5th ed. New York: Harper and Row; 1974. p. 406.
7. Editor, compiler, chairman as author Dausset J, Colombani J, editors. Histocompatibility testing 1972. Copenhagen: Munksgaard; 1973. p. 12-8.
8. Chapter in a book Weinstein L, Swartz MN. Pathogenic properties of invading microorganisms. In: Sodeman WA Jr, Sodeman WA, editors. Pathologic physiology: mechanisms of disease. Philadelphia: WB Saunders; 1974. p. 457-72.
9. Published proceedings paper DuPont B. Bone marrow transplantation in severe combined immunodeficiency with unrelated MLC compatible donor. In: White HJ, Smith R, editors. Proceedings of the 3rd Annual Meeting of the International Society for Experimental Hematology. Houston: International Society for Experimental Hematology; 1974. p. 44-6.
10. Agency publication Ranofsky AL. Surgical operations in short-stay hospitals: United States—1975. Hyattsville (MD): National Center for Health Statistics; 1978. DHEW publication no (PHS) 78-1785. (Vital and health statistics; series 13; no 34).
11. Dissertation or thesis Cairns RB. Infrared spectroscopic studies of solid oxygen [dissertation]. Berkeley (CA): University of California; 1965.

Other articles

12. Newspaper article Lee G. Hospitalizations tied to ozone pollution: study estimates 50,000 admissions annually. The Washington Post 1996 Jun 21; Sect. A:3 (col. 5).
13. Magazine article Roueche B. Annals of medicine: the Santa Claus culture. The New Yorker 1971 Sep 4:66-81.

Table pages

Type each table on a separate sheet; remember to double-space all data. If applicable, identify statistical measures of variation, such as standard deviation and standard error of mean. If data are used from another published or unpublished source, obtain permission and acknowledge fully.

Using arabic numerals, number each table consecutively (in the order in which they were listed in the text in parentheses) and supply a brief title to appear at the top of the table above a horizontal line; place any necessary explanatory matter in footnotes at the bottom of the table below a horizontal line and identify with footnote symbols *, †, ‡, §, , ¶, **, ††, ‡‡, etc.

Illustration legend pages

Type legends for illustrations double-spaced, starting on a separate page, following the table pages. Identify each legend with arabic numerals in the same manner and sequence as they were indicated in the text in parentheses (ie, Figure 1). Do not type legends on artwork copy or on pages to which illustrations may have been mounted; they must be typed on separate pages from the illustrations themselves.

When symbols, arrows, numbers or letters are used to identify parts of the illustrations, identify and explain each one clearly (if necessary) in the legend. Explain internal scale and method of staining in photomicrographs, if applicable.

Illustration preparation

Illustrations (including lettering, numbering and/or symbols) must be of professional quality and of sufficient size so that when reduced for publication all details will be clearly discernible; rough sketches with freehand or typed lettering are not encouraged. All illustrations (including x-rays) are best submitted as professional-quality, unmounted, black and white glossy prints at least 127 by 173 mm (5 by 7 in) but no larger than 203 by 254 mm (8 by 10 in). Do not place titles or detailed explanations on the illustration; such information should be given in the figure legends. Do not send x-ray film.

Each figure should have a label on its back indicating the number of the figure, author name(s), and top of the figure indicated with an arrow. Do not write on the back of the illustrations themselves; do not mount them on other sheets; do not bend, scratch or mar them with paper clips.

If photographs of persons are used, either the subjects must not be identifiable or their pictures must be accompanied by written permission to publish the photographs.

Cite each figure in the text (generally in parentheses) in consecutive order. If a figure has been published, acknowledge the original source and submit written permission from the copyright holder to reproduce the material. Permission is required, regardless of authorship or publisher, except for documents in the public domain. Articles may appear both in print and online versions, and wording of the letter should specify permission in all forms and media. Failure to get electronic permission rights may result in the images not appearing in the online version.

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Figures may be submitted in electronic format. All images should be at least 5 in wide. Images should be provided in EPS or TIF format on Zip disk, CD, floppy, Jaz, or 3.5 MO. Macintosh or PC is acceptable. Graphics software such as Photoshop and Illustrator, not presentation software such as PowerPoint, CorelDraw, or Harvard Graphics, should be used in the creation of the art. Color images need to be CMYK, at least 300 DPI, with a digital color proof, not a color laser print or color photocopy. Gray scale images should be at least 300 DPI and accompanied by a proof. Combinations of gray scale and line art should be at least 1200 DPI with a proof. Line art (black and white or color) should be at least 1200 DPI with a proof. Please include hardware and software information, in addition to the file names, with the disk.

Manuscript submission summary

Manuscript components

In terms of completeness of submission, the "manuscript" includes the following components:

- Manuscript (the original and 2 clear photocopies). The author should be sure to retain an additional copy in case of loss of the submission copies in transit.
- Illustrations (1 set for each manuscript).
- *RELEASE FORM* (signed by all authors, and by employer if study was a work for hire).
- Letter(s) of permission to use previously published material in all forms and media (if applicable).
- Consent form(s) to publish photographs in which subjects may be identifiable (if applicable).
- Cover letter from principal author (or author specified as correspondent) providing any special information regarding the submission which may be helpful in its consideration for publication.
- Computer disk with manuscript(s).

Mailing instructions

The manuscript should be securely packaged in a heavy-weight envelope (or carton if bulky) with illustrations placed between cardboard to prevent bending; do not use paper clips or in any manner fasten illustrations to cardboard that could scratch or mar them.

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Applied Kinesiology Status Statement

International College of Applied Kinesiology®-U.S.A.

The International College of Applied Kinesiology-U.S.A. provides a clinical and academic arena for investigating, substantiating, and propagating AK findings and concepts pertinent to the relationships between structural, chemical, and mental factors in health and disease and the relationship between structural faults and the disruption of homeostasis exhibited in functional illness.

AK is an interdisciplinary approach to health care which draws together the core elements of the complementary therapies, creating a more unified approach to the diagnosis and treatment of functional illness. AK uses functional assessment measures such as posture and gait analysis, manual muscle testing as functional neurologic evaluation, range of motion, static palpation, and motion analysis. These assessments are used in conjunction with standard methods of diagnosis, such as clinical history, physical examination findings, laboratory tests, and instrumentation to develop a clinical impression of the unique physiologic condition of each patient, including an impression of the patient's functional physiologic status. When appropriate, this clinical impression is used as a guide to the application of conservative physiologic therapeutics.

The practice of applied kinesiology requires that it be used in conjunction with other standard diagnostic methods by professionals trained in clinical diagnosis. As such, the use of applied kinesiology or its component assessment procedures is appropriate only to individuals licensed to perform those procedures.

The origin of contemporary applied kinesiology is traced to 1964 when George G. Goodheart, Jr., D.C., first observed that in the absence of congenital or pathologic anomaly, postural distortion is often associated with muscles that fail to meet the demands of muscle tests designed to maximally isolate specific muscles. He observed that tender nodules were frequently palpable within the origin and/or insertion of the tested muscle. Digital manipulation of these areas of apparent muscle dysfunction improved both postural balance and the outcome of manual muscle tests. Goodheart and others have since observed that many conservative treatment methods improve neuromuscular function as perceived by manual muscle testing. These treatment methods have become the fundamental applied kinesiology approach to therapy. Included in the AK approach are specific joint manipulation or mobilization, various myofascial therapies, cranial techniques, meridian therapy, clinical nutrition, dietary management, and various reflex procedures. With expanding investigation there has been continued amplification and modification of the treatment procedures. Although many treatment techniques incorporated into applied kinesiology were pre-existing, many new methods have been developed within the discipline itself.

Often the indication of dysfunction is the failure of a muscle to perform properly during the manual muscle test. This may be due to improper facilitation or neuromuscular inhibition. In theory some of the proposed etiologies for the muscle dysfunction are as follows:

- Myofascial dysfunction (micro avulsion and proprioceptive dysfunction)
- Peripheral nerve entrapment
- Spinal segmental facilitation and deafferentation
- Neurologic disorganization
- Viscerosomatic relationships (aberrant autonomic reflexes)
- Nutritional inadequacy
- Toxic chemical influences

- Dysfunction in the production and circulation of cerebrospinal fluid
- Adverse mechanical tension in the meningeal membranes
- Meridian system imbalance
- Lymphatic and vascular impairment

On the basis of response to therapy, it appears that in some of these conditions the primary neuromuscular dysfunction is due to deafferentation, the loss of normal sensory stimulation of neurons due to functional interruption of afferent receptors. It may occur under many circumstances, but is best understood by the concept that with abnormal joint function (subluxation or fixation) the aberrant movement causes improper stimulation of the local joint and muscle receptors. This changes the transmission from these receptors through the peripheral nerves to the spinal cord, brainstem, cerebellum, cortex, and then to the effectors from their normally-expected stimulation. Symptoms of deafferentation arise from numerous levels such as motor, sensory, autonomic, and consciousness, or from anywhere throughout the neuraxis.

Applied kinesiology interactive assessment procedures represent a form of functional biomechanical and functional neurologic evaluation. The term "functional biomechanics" refers to the clinical assessment of posture, organized motion such as in gait, and ranges of motion. Muscle testing readily enters into the assessment of postural distortion, gait impairment, and altered range of motion. During a functional neurologic evaluation, muscle tests are used to monitor the physiologic response to a physical, chemical, or mental stimulus. The observed response is correlated with clinical history and physical exam findings and, as indicated, with laboratory tests and any other appropriate standard diagnostic methods. Applied kinesiology procedures are not intended to be used as a single method of diagnosis. Applied kinesiology examination should enhance standard diagnosis, not replace it.

In clinical practice the following stimuli are among those which have been observed to alter the outcome of a manual muscle test:

- Transient directional force applied to the spine, pelvis, cranium, and extremities
- Stretching muscle, joint, ligament, and tendon
- The patient's digital contact over the skin of a suspect area of dysfunction termed therapy localization
- Repetitive contraction of muscle or motion of a joint
- Stimulation of the olfactory receptors by fumes of a chemical substance
- Gustatory stimulation, usually by nutritional material
- A phase of diaphragmatic respiration
- The patient's mental visualization of an emotional, motor, or sensory stressor activity
- Response to other sensory stimuli such as touch, nociceptor, hot, cold, visual, auditory, and vestibular afferentation

Manual muscle tests evaluate the ability of the nervous system to adapt the muscle to meet the changing pressure of the examiner's test. This requires that the examiner be trained in the anatomy, physiology, and neurology of muscle function. The action of the muscle being tested, as well as the role of synergistic muscles, must be understood. Manual muscle testing is both a science and an art. To achieve accurate results, muscle tests must be performed according to a precise testing protocol. The following factors must be carefully considered when testing muscles in clinical and research settings

- Proper positioning so the test muscle is the prime mover
- Adequate stabilization of regional anatomy
- Observation of the manner in which the patient or subject assumes and maintains the test position

- Observation of the manner in which the patient or subject performs the test
- Consistent timing, pressure, and position
- Avoidance of preconceived impressions regarding the test outcome
- Nonpainful contacts — nonpainful execution of the test
- Contraindications due to age, debilitative disease, acute pain, and local pathology or inflammation

In applied kinesiology a close clinical association has been observed between specific muscle dysfunction and related organ or gland dysfunction. This viscerosomatic relationship is but one of the many sources of muscle weakness. Placed into perspective and properly correlated with other diagnostic input, it gives the physician an indication of the organs or glands to consider as possible sources of health problems. In standard diagnosis, body language such as paleness, fatigue, and lack of color in the capillaries and arterioles of the internal surface of the lower eyelid gives the physician an indication that anemia can be present. A diagnosis of anemia is only justified by laboratory analysis of the patient's blood. In a similar manner, the muscle-organ/gland association and other considerations in applied kinesiology give indication for further examination to confirm or rule out an association in the particular case being studied. It is the physician's total diagnostic work-up that determines the final diagnosis.

An applied kinesiology-based examination and therapy are of great value in the management of common functional health problems when used in conjunction with information obtained from a functional interpretation of the clinical history, physical and laboratory examinations and from instrumentation. Applied kinesiology helps the physician understand functional symptomatic complexes. In assessing a patient's status, it is important to understand any pathologic states or processes that may be present prior to instituting a form of therapy for what appears to be functional health problem.

Applied kinesiology-based procedures are administered to achieve the following examination and therapeutic goals:

- Provide an interactive assessment of the functional health status of an individual which is not equipment intensive but does emphasize the importance of correlating findings with standard diagnostic procedures
- Restore postural balance, correct gait impairment, improve range of motion
- Restore normal afferentation to achieve proper neurologic control and/or organization of body function
- Achieve homeostasis of endocrine, immune, digestive, and other visceral function
- Intervene earlier in degenerative processes to prevent or delay the onset of frank pathologic processes

When properly performed, applied kinesiology can provide valuable insights into physiologic dysfunctions; however, many individuals have developed methods that use muscle testing (and related procedures) in a manner inconsistent with the approach advocated by the International College of Applied Kinesiology-U.S.A. Clearly the utilization of muscle testing and other AK procedures does not necessarily equate with the practice of applied kinesiology as defined by the ICAK-U.S.A.

There are both lay persons and professionals who use a form of manual muscle testing without the necessary expertise to perform specific and accurate tests. Some fail to coordinate the muscle testing findings with other standard diagnostic procedures. These may be sources of error that could lead to misinterpretation of the condition present, and thus to improper treatment or failure to treat the appropriate condition. For these reasons the International College of Applied Kinesiology-U.S.A. defines the practice of applied kinesiology as limited to health care professionals licensed to diagnose.

Approved by the Executive Board of the International College of Applied Kinesiology®-U.S.A., June 16, 1992.

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Division I

Informative Papers

Calming the Storms of Menopause – An AK Perspective

Derik S. Anderson, D.C.

Abstract

Menopause is one of the leading causes of health care visits for middle-aged women. As a result, it is one of the leading pharmaceutical prescriptions drivers. The primary goals of medicinal management are to ameliorate symptoms and prevent pathological processes because of a woman's changing hormone levels.

Complementary medicine, and applied kinesiology in particular, can play an instrumental role in enabling a woman to obtain these outcomes, in a treatment program that is personalized for an individual's needs.

The Midlife Transition

The symptoms of menopause (commonly known as perimenopause) are one of the leading reasons women seek healthcare in their 40s and 50s. These include hot flashes, insomnia, weight gain, heart palpitations, and irritability. The most frequently prescribed method of treatment is hormone replacement therapy (HRT). Of HRT medications, Premarin and Primpro are the most commonly prescribed, with nine million and six million current users, respectively. This makes them some of the most widely prescribed drugs in the United States.

While the efficacy of such synthetic-based hormone replacement therapy has not been clearly demonstrated since its inception in 1966, the recent release of two major studies has greatly solidified the picture.

Current Research on Hormone Replacemnt Therapy

The Women's Health Initiative and The Million Women Study are two of the largest women's health studies ever undertaken. They have shown that synthetic hormone replacement therapy is not efficacious in many cases. In fact, HRT can increase a woman's risk for disease.

It was originally proposed that HRT would reduce a women's risk for the three leading causes of death in women, heart disease, cancer, and stroke. These two studies found that, in fact, a women's chance of developing any one of these pathological processes was not decreased, but elevated. This point was driven home when the U.S. National Institute of Health aborted the Premarin portion of the Women's Health Initiative in July 2002.

Reduction of both symptoms and risk for heart disease, cancer, stroke, and osteoporosis can be achieved by restoring dynamic homeostasis to a woman's body.

Applied Kinesiology's Role in Women's Health

Applied kinesiology is a superb tool to determine the needs of a woman's body. While a woman's progesterone and then estrogen levels decrease during this transition, the amount of hormone replacement a woman may require, if any at all, is an individual need. And the need for support of other glandular systems should also be independently assessed. Women who have had hypoadrenal function, for instance, often experience an elevated level of menopausal symptoms. In such a case, addressing the adrenal dysfunction, either medullary and/or cortical, will greatly ease symptomatology.

A second dysfunction a woman may likely experience is hypothyroidism. Concomitant pituitary, adrenal, liver, and intestinal dysfunction is often found. Utilizing standard applied kinesiology testing methods, with appropriate laboratory testing as needed, will allow the primary dysfunctional system to be addressed.

Treatment of the primary reproductive endocrine system is paramount for a symptomatic woman. Testing of bio identical hormones, phytohormones, herbs, essential fatty acids, cofactors, and coenzymes is afforded to applied kinesiologists. Often due to lifestyle factors, a woman's body has adapted to elevated adrenal – based cortical androgens. Chronic supply of these hormones produces a decreased cellular response to hormones. Thus, when a women's estrogen and progesterone levels begin to decline, her body has a more dramatic response to this change. Couple this with hypoadrenia, and a women's reaction can be quite severe.

Assess for vitamin, mineral, and fatty acid need utilizing standard applied ainesiology testing protocols. Bio identical and phytohormones (molecules that mimic estrogen and progesterone activity) should be tested in the same manner as any weak indicator muscle while therapy localinzing to a neurolymphatic point. The product(s) that strengthen the most number of neurolymphatic points should be used.

Conclusion

Applied kinesiology is an excellent assessment tool for treating women who are experiencing the transition of menopause. Symptoms and clinical risk for disease can be reduced by restoring balance to systemic function.

Resources (not referenced in text)

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Applied Kinesiology Management of Menstrual Headaches: A Case History

Janet Calhoon, D.C., DIBAK

Abstract

A case history of applied kinesiological management of low back pain and headache associated with the menstrual cycle in a forty-one year old.

Introduction

Symptoms such as low back pain, mood swings, and headaches that occur with every menstrual cycle are accepted as "normal for me" by many, many females. The medical approach commonly is to treat the symptom rather than the woman.

Discussion

A forty-one year old, 5'4" 187 pound female presented with a long-standing history of low back pain, which started every month one week before her menstrual period. She also experienced a severe headache the first day of her period. As for mood swings, in her own words, "I'm a maniac." She reported her husband could regularly and accurately predict the first day of her period by the severity of her moods.

In the initial consultation, she remarked that she used aspartame on a daily basis. This in spite of the fact that her husband had discontinued its use three years earlier because of my instruction. I insisted she totally stop aspartame immediately. I also introduced her to some basic good nutrition and the rules for food combining which Dr. Goodheart teaches.

Rule 1: Do not combine fats (butter, cream, bacon fat) with high starches (potatoes, bread, cereals, sweets) at any one meal.

Rule 2: Do not combine acids and carbohydrates. Do not take buttermilk, orange juice, lemon juice, grapefruit juice or vinegar at any meal which also includes high starches and sugars.

Rule 3: Do not combine high proteins (meat, fish, eggs or cheese) with high starches (potatoes, cereals, breads, sweets) at the same meal.

The treatment plan consisted of basic applied kinesiological procedures with a look at lab work including an Adrenal Stress Index and/or a Female Hormone Profile.* On the initial visit I found and corrected a category 1, an upper cervical fix, cervical thoracic fix and thoracic lumbar fix and also treated the neurolymphatic of the left sartorius muscle.

On a second visit, five days later, she reported she was working on dietary changes and felt like she was going through withdrawal from aspartame! Overall she said she felt better.

Evaluations and corrections of very basic applied kinesiological procedures were made on one-week intervals for one menstrual cycle. I found a positive 2-hand therapy localization to the glabella and neurolymphatic for the right gluteus medius, which was negative when tested individually. Correcting a nasosphenoid fault negated this.

Her husband was unable to predict her next period and she said she didn't even know when it was coming. "I'm a different person – it was excellent."

*Because of her rapid and excellent response, the laboratory tests were not ordered.

Conclusion

This case study serves as a reminder how great a gift we have and the fantastic results all of us see on a daily basis. It is true that muscle testing should not be used alone but only as part of our diagnostic workup, which also needs to include standard physical examination, appropriate orthopedic and laboratory tests. Having said that, remember to do the basics, level the head, level the pelvis, teach the rules of food combing and the danger of food additives. Then listen to your patients report to you the miracles you accomplish for them and remember to be amazed.

Resources (not referenced in text)

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Duffy, Sr., D.C., Daniel H., *Applied Kinesiology, Choice of Champions, The Basic Course*, 1999, p.6-12.

Food Combining Rules, patient handout by Dr. George Goodheart.

Applied Kinesiology Management of Multiple Sclerosis – An Ongoing Case Study

Janet Calhoon, D.C., DIBAK

Abstract

A case history of multiple sclerosis management first presented in this forum three years ago is evaluated further.[1]

Introduction

Multiple sclerosis is a diagnosis that seems to be occurring with increasing frequency. The presenting symptoms are many and varied. When evaluating and treating a patient who has been medically diagnosed with multiple sclerosis, it will serve the doctor well to remember the wise words of Dr. Goodheart which we have all heard many times, "Treat the patient, not the disease."

Discussion

A 48-year-old female continues applied kinesiology care for a primary complaint of multiple sclerosis. She first presented five years ago and prior to entering my office, she had had all of her amalgams removed and undergone IV chelation with no improvement. After two years of AK care she went from not being able to write a check to showering without assistance.

Currently, a major complaint is low back pain. She gets relief with AK treatment. She goes to the pool several times a week for pool walking to improve strength and gait. She ambulates short distances with a cane in one hand with assistance to the other arm provided by another person or wall. She spends several hours each day in bed. To increase her muscle strength and tone, she was evaluated by a physical therapist in 2003 and worked with him for a few months and now continues the exercise program at home.

In any long term severe illness, the following four issues must be addressed: 1) parasites, 2) toxins, 3) allergies, and 4) heavy metals. In consideration of these we did a Comprehensive Stool Analysis with parasitology which was negative. We did an ELISA blood test for food allergies. We ran a 24 hour urine essential elements (showed a mercury level of 1.3 microgram per gram) and a hair analysis which also showed a low level of mercury (0.416 parts per million). The levels of mercury were within the labs acceptable ranges. However, levels well within the acceptable range can be toxic to susceptible individuals.[2] Certainly anyone with multiple sclerosis should be considered a susceptible individual. Oral chelation aimed at pulling out the remaining mercury is the next step of our treatment plan.

The psychological side of the triangle is as important as the chemical and structures side and this intelligent woman is aware of that. She has a drive to get well, is undeniably a Type A, works at exercise as mentioned earlier and strictly adheres to the rules of food combining.

Rule 1: Do not combine fats (butter, cream, bacon fat) with high starches (potatoes, bread, cereals, sweets) at any one meal.

Rule 2: Do not combine acids and carbohydrates. Do not take buttermilk, orange juice, lemon juice, grapefruit juice or vinegar at any meal which also includes high starches and sugars.

Rule 3: Do not combine high proteins (meat, fish, eggs or cheese) with high starches (potatoes, cereals, breads, sweets) at the same meal.[3]

Unfortunately she admits to emotional stress that at this time is irresolvable and impedes her progress. She correlates her low back pain level directly to the emotional stress and we are seeing some success using the emotional neurovascular points.

Before the onset of multiple sclerosis she was a conditioned athlete. She had been a swimmer in college and then an avid horsewoman. Recently she has been able to resume mild workouts using Nautilus equipment and is thrilled to be able to do so. On good days she can now drive herself to my office, (a trip of one hour one way) and can walk using only a cane for assistance without needing the assistance of another person. She is now able to attach a leash to her dog and put him out in the morning, for years when the dog came to her she needed to ask someone to do that for her. Also for years, even with assistance, she was unable to mount her horse. In 2003, with assistance, she was able to get on the horse and ride about 10 minutes in an indoor arena. That was a major and happy event!

Treatment consists of good basic applied kinesiological technique, most if not all of which is from the 100 hour courses. We do posture evaluation, palpate the TS line, acupuncture pulse points, muscle testing and then fix what we find. We look at all five factors of the IVF and the three sides of the triangle.

There are milestones still ahead; she cannot prepare meals because she doesn't have enough control to get things out of the refrigerator or cupboard. It is difficult for her to get her clothes from the closet or a drawer but she can now dress herself. In her words, "What is surprising is because of AK, I continue to improve, however slowly."

Conclusion

This paper takes a second look at a woman, now 48 years old, who was diagnosed with multiple sclerosis by a medical neurologist and confirmed with MRI. In the three years since this author's initial paper, and six years since starting treatment with an applied kinesiologist, she has had no acute exacerbations of multiple sclerosis.

Hopefully in the near future more patients with this dreaded diagnosis will be offered chiropractic care in a truly informed consent situation. Once again I quote the sage and forthright Dr. Daniel H. Duffy, Sr., "Chiropractic should be the FIRST choice of health care for the discriminating patient – not as is more usual, the LAST, and should include all patients suffering bodily dysfunction."[4]

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The Importance of Abdominal Oblique Muscles in Category I

Janet Calhoon, D.C., DIBAK

Abstract

Category I has been an integral part of AK courses from the beginning. In Vol. 1, Dr. Walther says of the external oblique abdominal "The integrity of this muscle division is important in category I pelvic involvements and of the internal oblique abdominal…" This is an important support muscle to the pelvis when there is either a category I or II pelvic involvement.[1] I propose that careful examination and thorough treatment of the abdominal obliques will resolve category I in many patients.

Introduction

Examination, therapy localization, challenge, muscular involvement, associated cranial faults and correction of category I are all well documented in the AK literature. It is well understood that "The category I pelvic fault is torsion of the pelvis without osseous misalignment at the sacroiliac articulations…"[2] It is also understood that there is almost always a weak piriformis on the lesion side and other frequently involved muscles are the gluteus medius, gluteus maximus, sacrospinalis and quadratus lumborum.

In 30 patients which I found myself correcting a category I on frequent visits, I remembered Dr. Walther's statements regarding the importance of the abdominal obliques. "The oblique abdominals are specifically important because of the major level factor they have on the crest of the ilium."[3]

Discussion

There were 30 positive category I patients, positive being determined by therapy localization to the bilateral sacroiliac joints, one palm up and one palm down.[4 5] Muscle testing of the rectus abdominus, internal oblique abdominal and external oblique abdominal found them to be functionally inhibited on all 30. Using AK treatment methods, tests were preformed for respiratory corrections, golgi tendon organ, neuromuscular spindle cell, neuro lymphatic treatment, neurovascular treatment as indicated by examination restored the involved muscle to a functionally facilitated state. When this correction was completed 26 patients no longer demonstrated a positive TL for a category I. On subsequent visits, the category I was absent when evaluated with the patient prone, and EID (eyes into distortion).

Conclusion

This study demonstrates once again what Dr. Goodheart and applied kinesiologists have been saying for decades "muscles move bones." It makes clear that when we are treating a category I, our best service to our patients will include a thorough evaluation of the abdominal muscles.

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Breathing Challenge For Optimal Rhythm

Eugene Charles, D.C., DIBAK

Abstract

Doctor is Latin for "teacher" and of all the things that a doctor can teach a patient to do, proper breathing would have to be the most pressing. While there are many general breathing exercises such as: Yoga, Fulford, Alexander Technique; there has been no way to discern what rate and rhythm is best suited for the individual. Presented is a mechanical challenge to determine what is the best breathing pattern for the patient using standard applied kinesiology protocols.

Discussion

The challenge can be performed on a patient when every muscle or at least multiple muscles show idiopathic inhibition patterns that do not respond to traditional AK answers (water, emotional points, multimineral etc.). Otherwise it can be tested to see which breathing pattern does not create an inhibition on a normal muscle. This latter procedure will be presented.

Procedure

Test a normal functioning muscle. In this example let's use a pectoralis major clavicular (PMC).

Have the patient breathe in for 2 seconds, hold it for 2 seconds, breathe out for 2 seconds then test the muscle. If it becomes inhibited continue to 3 second, 4 second or 5 second intervals. On rare occasions the patient may respond to varying times for inspiration, pausing, and expiration. (FYI: 3 seconds seems to be the most common).

Regardless of the cycle have the patient pause for 1 second after expiration before starting the cycle over again. For example the patient would breathe in for 3 seconds, hold it for 3 seconds, breathe out for 3 seconds then pause for 1 second before starting the cycle.

On inspiration have the lower ribs expand laterally and the ribcage open up like an accordion while accentuating the lumbar lordosis slightly. When expiring focus on the abdominals tightening thus decreasing the lumbar lordosis.

The patient should perform 10 sets in the morning, after lunch and before retiring. Eventually this could become their normal breathing pattern. As this procedure is in its nascency more time must be spent to ascertain the feasibility of this conscious breathing pattern becoming a subconscious habit.

Many teachers have impressed upon their students that they should meditate daily. It has also been said that, "One's life should be a meditation." These procedures allow specificity unique to AK this ability to help our patients live in meditation and decrease the anxiety of living out of rhythm.

Resources

Charles, G. Personal observations, 1992 to present.

Mechanical Challenge for The Percussor

Eugene Charles, D.C., DIBAK

Abstract

AK has recently added to its armamentarium percussion therapy using a mechanical device with multiple frequencies. This paper will succinctly describe a protocol to challenge for the optimal frequency for each individual.

Discussion

Robert Fulford D.O. described a method whereby percussion over areas such as the ribcage, deltoid tuberosity, lateral aspect of the knee and generally over the entire skeleton will increase range of motion. Goodheart discovered how pincer palpation as described by Travell can be used to locate myofascial gelosis and the need for percussion therapy by the unilateral functional inhibition of muscles (ICAK Annual Meeting 1999). The result of treatment was a demonstrable increase in range of motion. The diagnosis criteria described was to use a "listening hand" across from where the percussion was being applied. This author experienced frustration at attempts to use this technique and sought a way to use our standard AK procedures to find the optimal location and frequency for percussion therapy.

In reading Fulford's description of a diagnostic sign for percussion being pain and decreased range of motion, I realized that this was identical to the signs and symptoms traditionally attributed to the intraosseous subluxation. In 1992 I wrote a paper describing the use of a 128hz tuning fork to uncover intraosseous subluxations. (Charles, E. Utilizing a 128 Hertz Tuning Fork To Uncover Intraosseous Subluxations, Collected papers 1992) I have used and taught this method for 12 years and have observed its validity as a screening tool. I reasoned that a tuning fork placed over a fascial thickening or gelosing of bone, joint or muscle would likewise experience a global inhibition.

Procedure

A 128hz tuning fork placed over a muscle or bone will cause inhibition if a myofascial gelosis or an intraosseous subluxation is present. It is this author's belief that these represent the same phenomenom. This can be used as an adjunct to pincing palpation for the gelosis and two-hand therapy localization for the intraosseous subluxation.

Place a tuning fork over the area in question; if response is positive (muscle inhibition) place the percussor unit over the area set at its lowest frequency (Travell preferred the term rhythm and I wholeheartedly agree). If this causes inhibition of a muscle then this is the optimal rhythm for correction. If no response, continue increasing the frequency and testing a muscle until inhibition is noted.

There will be only one frequency that creates an inhibition. This frequency will be the same for all positive tuning fork screenings for the individual and will be so for all subsequent visits. If the frequency changes it means that the patient is or was neurologically disorganized.

Continue percussing until the mechanical challenge is negative and the tuning fork no longer creates an inhibition.

Range of motion should be greatly improved as well as other objective findings such as vital capacity, spinal reflexes and vision.

Conclusion

Through the inspiration and instruction of Dr. George Goodheart, applied kinesiology follows a standard modus operandi to which the wide myriad of techniques is coalesced into a usable format. Namely use *therapy localization*, or a form of it, to find where the problem is. Proceed to *challenging* to find the most efficacious manner of correction. Afterwards have the same parameters of muscle testing to measure the efficacy of the therapy along with another objective parameter such as range of motion. This standard AK diagnostic protocol remains the foundation by which applied kinesiologists are able to use functional manual muscle testing to find the optimal application of classical therapies.

This paper describes a method whereby percussion therapy as advocated by Fulford and the use of the "listening hand" can be brought into the refinements that applied kinesiology offers via the mechanical challenging model and its measurable effect on the nervous system. Here is presented the familiar protocol to ascertain which frequency or rhythm will best relieve fascial restrictions (either of bone or muscle) in the individual. This represents the sublime beauty inherent in AK to take a general treatment protocol and be able to specify it to the individual patient.

Resources

Charles, G. Personal observations, 1992 to present.

The Vintage Man: A Dedication to Dr. George Goodheart

Scott C. Cuthbert, D.C.

Abstract

To get to know Dr. George Goodheart through his research writings, seminar presentations, and ceaseless output is to experience the incessant productivity and clinical brilliance of his mind in daily patient care, and to feel the force with which he pursues his insights, concepts, and hunches. To be present as he approaches and questions individual patients who enter his clinical focus – these have been impressions of enduring grandeur for many of us. As you read his writings over the past 40 years he will appear as a powerful "natural force" possessing, as his good friend Dr. Dan Duffy says, "a hot line to the old one." He possesses the extra-ordinary capability of raising to clinical awareness and repeatable, demonstrable testing the labyrinthine ways in which the nervous system functions in the lives of patients.

Discussion

If you will listen with ears that are sharp enough, you will find that Dr. Goodheart's teachings make him someone heroic in your imagination, someone made up of several gods, beheld at a distance. As you use and pursue his methods of evaluation, you will grow accustomed to the "transference of the Goodheart miracles" and stature into your own daily practice.

During these early years of employing the applied kinesiology methods I have timidly entered more fully into the spirit of genuine chiropractic practice and consequently into the spirit of chiropractic life. In those very first days when I discovered the truth behind the methods of AK (days I will mark as an event in my life) a new language was born in me and by it all things were re-interpreted. It was not exactly clear to me all that Dr. Goodheart was teaching and saying in those early days – that is something we must all realize. But there was something beyond clarity and precision being enacted in my office as I began my AK immersion – IT WAS MAGIC, that is to say, a higher order of chiropractic revelation, perception and healing. Finally I was able to say, "I am on the *Board Walk* and *Park Place* of chiropractic!" Today, going through those initiatory experiences in AK again, I would probably find it quite ordinary. But then it was extra-ordinary. We all probably discovered AK because a hunger in our mind demanded it or we were ripe for it, and Drs. Goodheart, Walther, Leaf, and all the other venerable DIBAK's teaching methods were just suitably arranged to permit this experience to be lived.

It is not enough for us to love our work and our life as physicians practicing AK. We must go beyond that. We should become "transparent to the teaching," to paraphrase Joseph Campbell. You need not announce your love for your work in your clinic, which is a kind of self-flattery, but you will store it up in the bodies of chiropractic patients to carry with them wherever they go. *They will tell you* when you are practicing AK properly. Excessive technique arrogance or personal ego and self-concern are out of place, as they preclude love for the patient in your clinic. Additionally it will cloud your perception of the exquisite processes your patient is innately using to get well.

If you want to learn the science of chiropractic evaluation and treatment, meditate upon Dr. Goodheart's books; let him be the needle, let yourself be the thread, and practice unremittingly. Take his discoveries and principles as if they were discovered from your own mind, identify with them constantly and work on them carefully, and then (*like Oedipus!*) try to improve upon your father's teachings. The zealous student should lean into Dr. Goodheart to catch the subtlest sounds. If Pythagoras is right, there is no silence in the universe and with the least of his acts Dr. Goodheart can make a music that may enchant, instruct, and spark you onto new discoveries.

Listen closely to his voice as he speaks to a patient or at a seminar: it's a charming, welcoming, humorous, mahogany voice that any number of patients may say is a powerful therapy in itself. Watch him closely as he analyzes a patient with a difficult problem. Watch him study the patient's history and body language and admire the forehead of a thinker who embraces a vast field; see more than a half-century's experience in precision chiropractic and natural health care drift across his brain…the placid, vaulted Apollonian brow, contemplating the interactions, the light glancing in every direction. Then he will see the problem, the upright flame of insight will leap from his forehead and, poised now on the wave of explicit certainty, he is ready to manipulate the contrary tissues in the clockless nowever of his genius…

[For some, a reverence for their teacher is essential to the accumulation of knowledge. Remember how much Dr. Goodheart knows, how many times he has lived through each of the phases of chiropractic patient care for more than 50 years – so then, learn to drink from the fount in the portions ladled out to you by your own curiosity and zeal.]

Observe the least movement of Dr. Goodheart's hands as he pre-sets the patient's body and neuraxis prior to a manual muscle test (MMT). See how effortlessly he stresses the mechanical interfaces of the nervous system as he tests it. The MMT becomes the subtlest of instruments, transferring the current of the applied kinesiologist's thought into the body of the patient. Learning to examine a patient *like this* requires *a thorough commitment*. Develop a reverence for the MMT and the adjustment that corrects the body; make it legendary. These corrections are the signature left upon the patient's nervous system for the rest of their life. For the patient, it is the balm of Gilead for the pain at the roots and leaves of their brain; it may be the end of their sufferings, and a reminder for one and all of the brain-body nexus which, when disturbed, is the cause of so much disease.

As you study the work of Dr. Goodheart you will discover that he accepts the science of chiropractic as a fundamental living law in body function and accepts the need to become a lifelong student of the authority vested within the living body and its language. He is not only a physician – he is a student. He is no longer searching for something; he has found chiropractic. Dr. Goodheart has become a lifetime student, as all physicians who follow in his footsteps will find it necessary to be – to consent to be used by the same set of living laws in their service to patients.

The work of D. D. Palmer and the other chiropractic pioneers gave us the science of chiropractic. Deep down, we all have the suspicion that the applied kinesiology method of physical examination is the reddest rose that blooms among the leaves and thorns that are the rest of chiropractic; not as a separate component of the work of Dr. Palmer but as an integrated portion within the science of chiropractic. AK is the living application of the science of chiropractic.

Drs. Palmer and Goodheart were students. They spent their entire lives studying the science of chiropractic, and one of the fundamental things they learned was that there is no time in which you can ever quit learning about human biology and that mirror of it, the science of chiropractic. They learned to know and use the rules of health as they apply within us, and it is these rules that are sought in the restoration to health for any

dysfunction, disease, deficiency, or trauma for which the patient is seeking our help. Drs. Palmer and Goodheart studied every single mechanism within the body physiology as it applied to a given patient, and they were taught by each individual case the appropriate diagnostic and treatment program. They were taught by that which the body itself was trying to do. They gave the work to their beloved profession, but they only gave us clues, knowing that the doctors themselves had to become students of the work.

The AK method of assessment is not easy to acquire. It takes *years* of patience and patients to make it a working, efficient tool for use in diagnosis and treatment. Every patient will be a challenge to further improve our skills and there is no point at which a physician can say, "I know all there is to know about this particular problem." The very next visit of that patient will open new doors for further investigation. (AK, when used properly, will demonstrate this over and over.) No ruts are possible in treatment if your diagnostic method is this accurate: AK matches the neurological improvisation and individualism of the patients we treat…*usually*.

The challenge of applied kinesiology and the practice of the science of chiropractic are to consider the body's function as a whole – its structure and function as a unity – to accept this language of the nervous system as expressed through MMT. As physicians, we need to develop the diagnostic and analytical skills that allow us to identify where the innate mechanisms of the patient are not operating.

The maxim in any AK office is: to study the anatomy and physiology of the body constantly so as to internalize the structure and functions of the body so that the variations and anomalies and bizarre clinical symptoms which your patient may display will not cause you dismay or surprise. *Anatomy is destiny*, said Dr. Freud, and Dr. Goodheart will be delighted to usher you into the inner secrets of the "universal architecture" of the human nervous system.

If you pick up any one of the 30+ yearly research manuals written by Dr. Goodheart, you will discover so many open windows and doorways into the discovery, treatment, and understanding of nervous system health and disorder. Your study of any one of these works will be a *mescaline-highball* for your mind that may inspire you for weeks at a time. Any real study of the functioning of the human nervous system cannot help but pick up a single paper clip and discover that it is attached to all the others in the jar.

To study anatomy and physiology continuously as Dr. Goodheart has is like the painter who constantly returns to his drawing board for inspiration. It is my sense of things that it is his exacting, life long study of anatomy, physiology, and all things chiropractic that gives Dr. Goodheart that profound sense of structure/function that is the birthplace of his intuition. It allows him to make high-grade clinical decisions under the pressures of really complex patient presentations…complexities that might make other physicians' brains recoil or plop.

Dr. Goodheart's mind shows great fidelity and warmth for the truths of his own past (conservativism). He also shows great breadth and openness that is apparent in the speed with which he warms to new ideas (liberalism and modernity). His mind has ball-and-socket flexibility: he's the kind of person who can give undivided attention to four things at once, it sometimes appears.

This paper's subtitle could have been "A ***Re***dedication to George Goodheart." When we write a dedication to a man who has given a great service to humanity, there is a tendency to think of it as something that happened only in the master's own life and that this is a new day and must be filled with new discoveries. A ***Re***dedication, on the other hand, is a living thing, a continuing experience, an unfolding of the understanding, with the promise of greater truths to follow. Such is the work of Dr. George Goodheart. "That which exists, persists." He gives us an understanding of the meaning of MMT as a diagnostic principle in healing and demonstrates it to us by his work as a man and as a physician, by experimentation and the treatment of patients, and by the classroom instruction he leaves with his students.

He is a perceptive friend to his own friends and understands people in his own way. His continuous support and undeviating loyalty to the ICAK and its members have meant a great deal to us. After studying the applied kinesiology program with him for many years, Dr. George Goodheart will always lie at the back of my brain, the Great Ancestor, old Adam Cadmus.

Resources

Cuthbert, S. Personal observations, 1996 to present.

Applied Kinesiology Management of Tic in a Pediatric Patient: A Case History

Cecilia A. Duffy, D.C., DIBAK

Abstract

OBJECTIVE: To describe the use of applied kinesiology in the management of a 15-year-old female with tic.
CLINICAL FEATURES: This patient had a four-month history of episodic eye tic.
INTERVENTION AND OUTCOME: Applied kinesiology methods were utilized to treat this patient with successful resolution of the tic.
CONCLUSION: Applied kinesiology methods can be useful in treatment of a pediatric eye tic.

Key indexing terms: Applied kinesiology, tic, pediatric.

Introduction

Tic is a neurological disorder that falls in the category of involuntary movements. "Tics are patterned sequences of coordinated movements that appear suddenly and intermittently."[1] Tics vary in location and complexity and can include such movements as eye blinking, sniffing, shoulder shrugging, touching parts of the body, vocalizations, etc. Tourette syndrome is an example of a severe tic. Tics can be controlled briefly with conscious effort.[2]

Discussion

A fifteen-year-old female experienced sudden onset of an eye tic that involved blinking of the eyelids and rolling of the eyes independent of each other with episodes generally lasting twenty minutes, but could last for one or more hours. Her medical pediatrician and an ophthalmologist saw her two days after the onset of the tic. A CT scan of the brain, complete blood count with differential, and a Mono-Spot test were ordered by the pediatrician and reported as unremarkable. A diagnosis of Tic was given with no treatment offered. Four months after onset of the tic the patient presented for evaluation. At this time, the tic was occurring approximately every two to three days, with episodes lasting twenty minutes. The longest episode of tic was twelve hours. The longest period of time she went without experiencing an episode of tic was sixteen days. She could control the tic with looking down or concentrating, occasionally with rest. Fatigue was associated with onset of the tic and just preceding the onset of the tic, she would experience nausea or a slight headache.

Initial examination and treatment: Physical examination revealed weight 116 pounds; height 5'4"; axillary temperature 98.6º; salivary pH 7.0; blood pressure seated 114/80, standing 120/90, and supine 110/80; pulse seated 88, standing 92; Lingual Ascorbic Acid Time Test right and left sides 5 seconds; hematocrit 41; breath holding time 15 seconds; vital capacity 1900/58%; right handed with right dominance of ear, hand, foot, and left dominance of eye; negative color blind test; and first morning urinalysis pH 6.5, S.G. 1.020, chemistry negative, Sulkowich test for urinary calcium grade 3, and Keonsburg test for urinary sodium 30 plus. A copy of the complete blood count with differential and the Mono Spot test results that were performed two days after onset of the tic were reviewed. Tests were unremarkable except for the differential which revealed

elevated neutrophils at 77% (30-65%) and decreased lymphocytes at 15% (20-55%). The mother of the patient brought in a home video of the patient during an episode of tic that confirmed the description given by the mother and the patient. Postural examination revealed an elevated right occiput, depressed right shoulder and pelvis, and bilateral pronation. Initial evaluation and treatment with applied kinesiology revealed the following: structural subluxations at the pelvis (Category 2 right posterior ischium), thoracic 2, left sphenobasilar suture inspiration fault, right temporal bulge fault, and bilateral lateral talus; and left temporomandibular joint strain counterstrain of the external pterygoid muscle.[3] She was instructed to purchase over the counter arch supports and wear them at all times, to remove cow's milk and products from her diet, and reschedule within two weeks.

Second evaluation and treatment was fifteen days after first treatment: She experienced four tic episodes in fifteen days, the first one was two days after initial treatment lasting one hour, the other three were three days in a row coinciding with the new year holiday (staying up later, eating foods not generally consumed) lasting one-half hour, three hours, and one hour respectively. She had been experiencing the tic every two to three days, so at that rate, one would have expected five to eight episodes in the fifteen days after her first evaluation and treatment, however, she only experienced four episodes. Applied kinesiology evaluation and correction revealed: subluxations at the pelvis (Category 1 left lesion, left posterior ilium), right occipital fixation, thoracic 4, right internal frontal fault; and contraction weakness/strain counterstrain of the right latissimus dorsi.[3] Blood sugar handling problems were discussed with the patient and her mother as a possible contributor to the tic and the following recommendations were made: schedule the patient for venipuncture to obtain a fasting chemistry, complete blood count with differential, Thyroxine (T4), T3 Uptake, and Thyroid Stimulating Hormone (TSH), and instruction that if the patient experienced the prodromal symptoms of nausea or headache (that preceded the tic) to immediately drink a glass of orange juice and follow up with a protein. This was done to get a sudden rise in blood glucose with the juice and then a stabilizing effect of the blood glucose from the protein.

Third evaluation was three days later: Fasting laboratory drawn, (the 28 unit chemistry, complete blood count with differential, T4, T3 Uptake, and TSH).

Fourth evaluation was the following day: Telephone discussion with patient's mother for interpretation of the laboratory tests. The mother reported that the orange juice and protein (as peanut butter) routine stopped two potential episodes of tic; the patient experienced her typical prodromal headache and/or nausea twice but they were aborted with the food and no tic developed. The chemistry, complete blood count with differential, T4, T3 Uptake, and TSH were all entirely within the normal laboratory reference ranges. She was instructed to schedule her daughter for follow-up for evaluation with applied kinesiology methods.

Fifth evaluation and treatment was nine days following the telephone conversation: Patient reported two episodes of the prodromal headache and/or nausea that were aborted with orange juice and peanut butter, and no tic developed. Between the second and fifth evaluations spaced thirteen days apart, she experienced a total of four prodromal episodes, where five to seven tic episodes would have been expected at the initial rate of every two to three days. Postural examination revealed a depressed right shoulder. Applied kinesiology evaluation and structural correction revealed: subluxations at thoracic 7, thoracic 4, lumbar 1, nasosphenoid cranial fault on the left; pinching the conditionally facilitated right latissimus caused it to convert to conditionally inhibited and was corrected with percussion of the right latissimus and treatment to the neurolymphatic point for the latissimus at the left anterior 7th intercostal space at the rib cartilage junction and posteriorly at the T7-T8 lamina on the left; and pituitary drive was diagnosed and corrected.[3] For the chemical side of the triad of health, nutrients related to blood sugar handling were tested against the positive latissimus dorsi and a product was found to be necessary based on oral insalivation of the product negating the previously positive indicator. She was placed on Biotics Bio-Glycozyme Forte at one three times a day in between meals.[4] Extensive dietary counseling was done with the patient and her mother as to types of food

she should and should not be consuming, especially avoidance of processed carbohydrates. She was also instructed to eat starchy or naturally occurring high sugar containing foods only at the end of a protein meal. She was to reschedule in three weeks. At the end of this office visit, the patient stated that she was experiencing the nausea that precedes onset of the tic. When questioned, the patient stated that the prodromal nausea had begun about ten minutes before the office visit had ended, but she did not want to interrupt the instructions she was receiving. Orange juice and walnuts were obtained for the patient to consume within one minute of her report of symptoms, however while she was consuming the juice and nuts, the tic began. She finished the food and the tic stopped within approximately three minutes from its onset. This was reported by the mother as the shortest tic episode the patient had ever experienced. Lastly, the report of the CT scan of the brain that had been performed four months previously at the onset of the tic was reviewed; it was reported as unremarkable.

Sixth evaluation and treatment was twenty-two days following the fifth evaluation: The patient experienced three episodes of prodromal headache in which she consumed orange juice and protein and the tic never occurred. She also reported that she was feeling more energy and "back to her old self". The mother of the patient reports that the patient was very compliant with the dietary instructions. Postural examination revealed a depressed right shoulder. Applied kinesiology evaluation and structural correction revealed: subluxations at thoracic 7, thoracic 4, cervical 6, hologrammic subluxation at thoracic 12; and bilateral muscle spindle cell/Golgi tendon organ treatment directed at inhibiting over facilitated bilateral temporalis muscles.[3] She was instructed to continue the supplement (Bio-Glycozyme) and reschedule in one month.

Seventh evaluation and treatment was one month after the sixth evaluation: The patient reported no episodes of prodrome or tic. Postural evaluation revealed a depressed right shoulder. Applied kinesiology evaluation and structural correction revealed: subluxation at thoracic 7, hologrammic subluxation at lumbar 2 and lumbar 3, right internal frontal cranial fault; pinching the conditionally facilitated right upper trapezius caused it to convert to conditionally inhibited and was corrected with percussion of the right upper trapezius and treatment to the neurolymphatic point for the right upper trapezius at the right anterior, proximal arm and the right posterior arch of cervical 1; positive therapy localization to the xiphoid (indicating diaphragm dysfunction) that was negated with muscle spindle cell activity to inhibit an over facilitated left psoas and neurolymphatic correction at the sternum.[3] She was instructed to reschedule in seven weeks.

Eighth evaluation and treatment was seven weeks after the seventh evaluation: The patient reported no prodrome or tic episodes. Postural examination revealed a depressed right shoulder. Applied kinesiology evaluation and structural correction revealed: subluxation at thoracic 7, thoracic 4, hologrammic subluxation at thoracic 7 and lumbar 3; left temporalis muscle spindle cell/Golgi tendon organ treatment directed at inhibition; positive therapy localization of the left pulse points on the wrist revealed positive kidney-bladder meridian involvement with subsequent finding of an inhibited right psoas that ultimately facilitated with correction of the lumbar 3 hologrammic subluxation; and pituitary drive technique correction.[3] The patient was to remain on the supplement and check-in in three months.

Ninth evaluation was eleven weeks after eighth evaluation: Patient presented for a routine physical examination for camp. The previous recurrent finding of a depressed right shoulder on postural examination had resolved; the shoulders were level. Previous applied kinesiology findings were re-evaluated, particularly the recurrent thoracic 7 subluxation, and all findings were negative. The patient was instructed to decrease the dose of the Bio-Glycozyme to once a day until the current prescription was finished, and she was discharged from active care.

Tenth evaluation was a phone call received from the patient's mother fifteen days after the ninth evaluation. The patient had been a camp for a week and kept her diet regimented according to my instruction but experienced a three hour episode of eye tic the day preceding the phone call. Use of orange juice and protein did not stop the tic. We deduced that the patient's physical activity had sharply increased while at camp which

was probably responsible for the blood glucose drop and subsequent tic episode. The patient was instructed to increase the Bio-Glycozyme back to three time a day until camp was over, to increase the amount of food consumed at her meals and snacks, and to call if any prodrome or tic episodes occurred.

It has been five months as of the date of writing this paper and the patient has not experienced any further prodromes or tics.

Conclusion

This pediatric patient with tic was managed successfully and conservatively utilizing applied kinesiology methods. It should be pointed out that there was a reduction in the number of episodes of tic between the first and second evaluation when only structural applied kinesiology methods were utilized. Upon the addition of chemical measures (blood glucose stabilization management and supplementation) to structural corrections, the prodromal episodes were aborted and thus no tic developed. With further chemical management and structural corrections, the prodromal episodes ceased and the patient has been free of the tic since.

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Applied Kinesiology Management of Urinary Incontinence in a Pediatric Patient: A Case History

Cecilia A. Duffy, D.C., DIBAK

Abstract

OBJECTIVE: To describe the use of applied kinesiology in the management of a twelve-year-old female with urinary incontinence.
CLINICAL FEATURES: This patient had a five-month history of urinary incontinence following emergency appendectomy surgery.
INTERVENTION AND OUTCOME: Applied kinesiology methods were utilized to treat this patient with successful resolution of the urinary incontinence.
CONCLUSION: Applied kinesiology methods can be useful in treatment of urinary incontinence.

Key indexing terms: applied kinesiology, pediatric, urinary incontinence.

Introduction

Urinary incontinence occurs when there is leakage of urine involuntarily, occurring most commonly in older patients. Urinary incontinence can be classified in four categories.

1. Total incontinence: Loss of urine constantly, no control.
2. Stress incontinence: Loss of urine with increases in intra-abdominal pressure such as with coughing, sneezing, lifting, or exercising.
3. Urge incontinence: Loss of urine preceded by a strong urge to void.
4. Overflow incontinence: Loss of urine as a result of the bladder receiving extra urine in an already over-distended bladder.[1]

Discussion

A twelve-year-old female presented with a chief complaint of urinary incontinence. The incontinence had begun five months earlier following an emergency appendectomy. She experienced stress incontinence, as well as total incontinence. The total incontinence was not persistent, but rather occurred occasionally. She described the episodes of total incontinence as having passed urine at times of no stress, for example, sitting or lying down. Whether this actually represented occasional episodes of overflow incontinence was hard to determine in this patient. She had first come under care 11 months prior to presentation for the incontinence. At that time she was seen for routine physical examination and to evaluate and treat a skin disorder and heel pain. She was seen twice in one month for treatment with resolution of the heel pain and the skin disorder improving. Other pertinent history revealed that the patient had begun her menstrual cycle early at the age of 10.

First evaluation and treatment: There were small incision scars at the umbilicus, above the pube, and over the right lower quadrant associated with the appendectomy. Postural examination revealed no postural alterations. Applied kinesiology methods were utilized for diagnosis and correction of the following: subluxation correction of a left lesion Category I pelvis with a left posterior ilium, right occiput, thoracolumbar fixation, lumbar fixation, and left temporal bulge cranial fault; stretch induced inhibition of the previously facilitated left gluteus maximus was corrected via trigger point therapy; palpation of the left levator ani with Valsalva maneuver revealed bulging (indicating inhibition of the left levator ani) and was corrected via neurolymphatic reflex point therapy at the left posteromedial and left anteromedial proximal thigh; Valsalva maneuver inhibited a previously facilitated left gluteus medius and was corrected via a uterine lift maneuver.[2] She was instructed to follow-up in approximately two weeks.

Second evaluation and treatment was 17 days following the first evaluation and treatment: She described some soreness just above the pubic symphysis following the treatment that lasted a few days and resolved itself, but otherwise reported that the urinary incontinence was completely gone. Applied kinesiology was again utilized for diagnosis and correction of the following: subluxation correction of a Category 3 and thoracic 7.[2] The patient was placed on a self-schedule basis.

Conclusion

Successful management via applied kinesiology methods of a five-month history of urinary incontinence in a twelve-year-old female is presented. One treatment that consisted of reducing pelvic, spinal, and cranial subluxations, correction of muscle dysfunctions, and an adjustive maneuver to lift the uterus resulted in permanent correction of the urinary incontinence.

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Pumping The Liver

Daniel H. Duffy Sr., D.C., DIBAK

Abstract

A manipulative procedure involving manual pumping of the liver that appears to have effects similar to a coffee enema is presented.

Key indexing words: applied kinesiology, liver, pump, coffee enema.

Introduction

The sudden clinical notion to pump the liver of patients arose out of the following ideas learned by the author over the years:

1. The existence of subluxations causing liver dysfunction in unresolvable or difficult pain cases.
2. During the author's initial experience in the investigation of the applied kinesiology Melzack-Wall tapping technique for pain control,[1] it was quickly discovered that the liver was involved an overwhelming percentage of the time. Personal communication with Dr. Goodheart confirmed this clinical experience.
3. It was discovered that the coffee enema has an immediate beneficial effect on pain. It was first used during the Crimean War by nurses for pain control in soldiers when hashish supplies ran out. Coffee appeared similar to the dark brown hashish and a nurse's sudden insight to use coffee in an attempt to achieve a placebo effect on the suffering soldiers resulted in the discovery that coffee in the bowel had a better pain relieving effect than the hashish.[2]
4. The author experienced the physiological effect of the coffee enema after learning about it from William Donald Kelley, DDS, the Texas orthodontist who developed metabolic typing and popularized the long lost discovery of the cause and cure of cancer.[3] The effect was noted in the sudden reduction of eyelid edema due to blepharitis.

Discussion

The liver pump technique is diagnosed and corrected in the following manner.

The patient may present with clinical symptoms relating to liver dysfunction, for example, dark circles under eyes, varicose veins, hemorrhoids, history of alcoholism, long-term refined diet, bowel movement problems, dry skin, itching skin and feet, frequent skin rashes, sore nipples, burning feet, blurred vision, scotomas, bitter, metallic taste in mouth, poor fat metabolism/steatorrhea, menstrual dysfunctions, migraine headache,[4] or pain.[2]

The pectoralis major sternal is related to the liver.[5] Both the postural indicator of a weak pectoralis major sternal (elevation with slight posterior placement of the shoulder)[6] and the temporosphenoidal line indicator of a pectoralis major sternal may be present,[7] and a conditionally inhibited pectoralis major sternal will be present. Challenge applied by pumping the liver 4-5 times will result in the pectoralis major sternal becoming conditionally facilitated. Also diagnose any of the other 5 intervertebral foramen (IVF) factors related to the pectoralis major sternal and note.

The liver pump technique is applied in the following manner: The doctor sits on the right side of the supine patient and places the palm of the right hand over the right lower rib cage just inferior to the breast on the right side of the chest. The doctor's left hand is placed comfortably over the right. The right thumb should circle down over the side towards the patient's back if the hand is large and the patient small. The tips of the fingers should reach almost to the midline of the body depending on the size of patient's chest and the doctor's hands. Exert a pressure simultaneously towards the left side, the middle of the back, and down towards the umbilicus all in one motion. The idea is to exert a squeezing type pressure down on the liver to cause it to express its contents. Quickly release the pressure after each pumping motion to aid rebound effect. Allow the hand to rest limply on the chest following each pumping action prior to the next pumping action. Pump the liver for at least a minute with about one pump every 2-4 seconds. This procedure probably should not be used in the osteoporotic patient.

Following liver pump, reassess the pectoralis major sternal function; it should now be conditionally facilitated. Reassess any of the previously found positive 5 IVF factors via the 51%er approach[8] and correct any that remain. Pumping the liver usually eliminates the need to correct the 5 IVF factors that were previously testing positive.

The author theorizes that pumping the liver reduces the liver congestion that caused the "short-circuiting" of the 5 IVF factors originally found positive. Following the liver pump, the positive findings are no longer present. The circuits are therefore presumed to be reset requiring no further treatment.

It is the opinion of the author that pumping the liver has the effect of a coffee enema although it is not recommended to replace coffee enemas with the technique. Liver pumping should be used to supplement the coffee enema rather than replace it.

Conclusion

Pumping the liver appears to improve physiological function of the liver as evidence by conditional facilitation of a previously conditionally inhibited pectoralis major sternal muscle and removal of any positive indications to treat any of the 5 IVF factors related to the pectoralis major sternal/liver.

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Effects of Pumping The Liver In Two Case Histories

Daniel H. Duffy, Sr., D.C., DIBAK

Abstract

OBJECTIVE: To present two case histories in which pumping the liver resulted in significant and immediately measurable clinical outcomes.
CLINICAL FEATURES: One patient experienced post-surgical vertical diplopia and the other patient experienced hemorrhoidal pain.
INTERVENTION AND OUTCOME: The major intervention consisted of pumping the liver along with the timely use of other applied kinesiology methods with immediate symptom reduction.
CONCLUSION: A new method of manipulation by physical pumping of the liver shows good clinical response in two patients with varied symptoms.

Key indexing terms: Applied kinesiology, liver, pump, vertical diplopia, hemorrhoids.

Discussion

Case history number 1: A middle-aged male underwent detached retina surgery resulting in vertical diplopia. Demonstration of the vertical diplopia was accomplished in the following manner: the examining physician sat on a stool four feet from the patient and held up his index finger. The patient covered his good eye and looked at the doctor's finger with the dysfunctional eye. The patient then conveyed what he saw by holding his own two index fingers, one above the other and slightly displaced laterally. Applied kinesiology postural examination revealed an elevated shoulder on the left with the left shoulder severely drawn in towards the center of the body,[1] (one of the most extreme indications of a conditionally inhibited pectoralis major sternal ever noted by the author's clinical experience); palpation of the temporosphenoidal line revealed a tender nodule at the pectoralis major sternal/liver point;[2] and manual muscle testing revealed a conditionally inhibited left pectoralis major sternal.[3] The conditionally inhibited pectoralis major sternal initially responded to therapy localization of its neurolymphatic point at the right fifth intercostal space on the chest by becoming conditionally facilitated.[3, 4] It was at that moment that the author serendipitously decided to pump the patient's liver.[5] After about one minute of pumping the patient's vision was rechecked. The patient stated that the vertical diplopia was no longer present and he saw only one finger.

Reexamination of the temporosphenoidal line revealed that the nodule and its palpatory pain was eliminated, the pectoralis major sternal tested conditionally facilitated and the NL point was no longer positive (tested as a 51%er).[4] The neurolymphatic point was then treated even though it no longer showed positive therapy localization. The vision was immediately rechecked as described above and was found to have lost fifty per cent of the original correction which was then immediately recovered by repeating the liver pumping. The applied kinesiology examination and treatment was then completed which involved pelvic category one,[6] subluxations of the occiput and upper thoracic spine,[7] a limbic fixation,[8] and open ileocecal valve,[9] insuring that only diagnosed problems were corrected. Reexamination of the vision following completion of the applied kinesiology workshop protocol revealed that the dysfunctional eye continued to show the normal vision achieved by the initial liver pumping activity. When seen the following month the patient claimed that the vertical diplopia was eliminated totally for about a day and a half following the treatment at which point it

gradually returned. On his second examination and treatment the same results were obtained and steps were taken to nutritionally support the patient's liver function.

Case history number 2: A 37-year-old pregnant female (24 weeks gestation) complained of hemorrhoidal pain. On a 0-10 pain scale indicating rising pain with rising number, the patient gauged her hemorrhoidal pain: 4/10 sitting, 7/10 supine. The need for pumping the liver was diagnosed[5] and the liver was pumped for one minute. Patient reevaluation of the hemorrhoidal pain was a 1/10 sitting and a 4/10 supine. Correction of an anterior thoracic subluxation at T5[7] completely eliminated the pain in both sitting and supine positions.

The liver pump technique was serendipitously utilized for the first time on the patient presented in case history number 1. A significant finding during the investigation of the liver pump technique that impressed this author was the negative effect produced by unnecessary correction to the pectoralis major sternal/liver neurolymphatic reflex point which reduced the amount of normal visual function regained by an estimated 50%, thus supporting the wise admonition against applying treatment without diagnosis. Manipulative treatment rendered via applied kinesiology techniques fulfills this important requirement for timeliness.

Conclusion

Two case histories are presented that showed clinical improvement of their symptoms with a new manipulative treatment to the liver.

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The Sagittal Suture Fault

Daniel H. Duffy, Sr., D.C., DIBAK

Abstract

Abdominal muscle weakness related to the sagittal suture fault has been found to be similar to the weakness of neck flexors that accompany internal and external frontal bone faults.

Key indexing terms: applied kinesiology, cranial faults, sagittal suture fault, internal frontal fault, external frontal fault, abdominal muscle, neck flexor muscles

Discussion

Frontal bone rotation faults cause conditional inhibition of the neck flexors when testing both left and right simultaneously. The muscle weakness is not found during single muscle testing of the neck flexors left and right one at a time.[1]

Sagittal suture faults have been found to cause conditional inhibition of the left and right rectus abdominus when tested individually, but not simultaneously. This suggests a type of mirror image relationship in the muscle responses relative to neck flexor weaknesses, the significance, if any, of which is unknown.

Correction of the sagittal suture fault by manipulation to separate the suture eliminates the conditionally inhibited rectus abdominus finding and improves patient symptoms, especially those related to low back pain complaints. It is the experience of this writer that patients who complain of having "weak backs" in fact have 'weak fronts" as demonstrable via applied kinesiology muscle testing techniques.[2]

Conclusion

The sagittal suture cranial fault is related to the abdominals in reverse manner in which the neck flexors are related to the frontal cranial faults. The sagittal suture fault responds to manipulation to separate the suture and facilitates recovery in the low back pain patient.

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Case Study: Severe Right Arm Neuralgia and Weakness Following Surgery

David Leaf, D.C., DIBAK

Abstract

This paper describes using muscle testing to diagnose patients with nerve damage of the right upper extremity. This case demonstrates a patient that has multiple sites of injury following trauma. The patient had an injury to the cervical spine, which could only be found, in a weight bearing position and not in a supine position. In addition, injuries at the thoracic outlet, elbow and wrist appear to have contributing factors to the patient's symptom pattern. Finally, coordinated therapies when applied simultaneously with the patient's cooperation will many times result in a rapid reversal of the symptom pattern.

Discussion

The patient entered the office complaining of a complete lack of strength in the arm and hand, dropping of objects from his hand, numbness throughout the arm, and an inability to raise his arm above 30 degrees of abduction and flexion.

The patient, a white male age 67, had normal functioning of his arm prior to surgery to remove his right kidney. After the operation when he came out of anesthesia, he reports that he was unable to clasp objects with his right hand. Over a 24-hour period, he reports that he found himself unable to raise and utilizing his right arm in the normal fashion. He was evaluated in the hospital prior to his release neurologically and was given an MRI, which reported negative findings. The neurologist stated that he must have" a nerve problem in the arm" of undisclosed nature that could slowly resolve itself. He reported to my office four weeks later, complaining of the above symptoms that were not improving.

Evaluation of the patient was conducted. A comparison examination of the non-involved extremity was first performed. This showed normal range of motion and strength of all of the major muscles and joints. On the right side, he was unable to move his fingers more than 3 degrees, which were in a held in a flexed position, He had 5 degrees of wrist flexion and extension, 30 degrees of shoulder flexion and abduction. Testing of the hand was impossible to do to the failure of muscles to respond. The patient had marked weakness of the deltoid and was able to flex his arm at the elbow 30 degrees. Considering the areas of possible nerve entrapment and the magnitude of weakness, the examiner passively raised the arm above the patient's head and asked him to attempt to move his fingers. With the arm elevated, he was able to flex his fingers at the proximal and distal joints almost making a fist. We was also able to flex and extend his wrist over 40 degrees. The arm was then lowered to its original position. Cervical traction was then applied to the patient's neck by reaching around and supporting the patient's chin with the forearm and lifting the head. He was again able to move the fingers and the wrist.

The patient was then placed in a supine position and movement of his hand was measured with him in a completely recumbent position it was noted that in this position he was able to move his fingers through approximately a 30 degree range of motion. The patient is then placed in a weight bearing position and it was noted that he immediately lost the ability to move his fingers.

Palpation of the chest cage revealed marked tenderness of the pectoralis minor muscle

A working partial diagnosis of a thoracic outlet syndrome due to injury to the pectoralis minor muscle and a hidden cervical disc in a weight bearing position was made.

Treatment was initiated towards alleviating the thoracic outlet center strain. Strain counterstrain was utilized on the pectoralis minor muscle. The patient was instructed on how to perform this at home and he was told to do this every two hours. A cervical traction over the door unit was fitted to the patient. Our procedure is to slowly add weight to the bag until a positive sign is found in the patient. This occurred at 6 pounds. At this weight, he was able to have some contraction of the triceps muscle, which prior to this offered no resistance in muscle testing and was able to flex his fingers. The patient was instructed to utilize the cervical traction for 10 minutes every two hours until seen in the office again. In the region of the neck, strain counterstrain and fascial treatment were given to the levator scapula, the neck extensors and the scalenes. The individual treatments were based upon trigger point localization and reduction of trigger point tenderness based on either elongation or shortening of the muscles. Review of the MRI, challenges and palpation indicated anterior and superior misalignments of C 5 on 6 and C 6 on 7. These were corrected in the office. Topical application of ibuprofen over the cervical nerve roots was to be done at home for three days. The patient was instructed to reduce all trans fats and to increase omega 3 oils and the cofactors necessary for their conversion. Finally, the patient's sleep position was examined. He was asked to lie on the table in the position that he would fall asleep in. He placed himself on his right side and the headrest was adjusted to the height he said his pillow was. He was instructed not to lie on the involved shoulder and shown how to determine a height for the pillow that was appropriate for his size. The patient was scheduled to be seen in one week.

On his return, he was able to grasp a dynamometer and had recorded 5 lbs. of pressure. With the armed elevated, he recorded15 lbs. Evaluation of the hand, wrist and elbow revealed misalignments in the carpal bones and the radial head, which were corrected. This resulted in an increase of 5 pounds as tested with the hand dynamometer. The patient was instructed on how to reposition the carpal bones and the radial head on a daily basis. He was given a theraband and instructed to begin very mild exercise of the pronator muscles. Evaluation of the pectoralis minor revealed a dramatic reduction in trigger point tenderness. The blood oxygen levels in the hands were evaluated using a Pulse-ox meter. His right middle finger registered 93% the left a 98%. The patient was then asked to march in place for 1 minute. The oxygen levels were then 92% on both hands. Treatment was then rendered to increase respiration. This consisted of normalization of rib function, thoracic fixations, diaphragm and oral and nasal breathing. The patient was then asked to walk up and down the hall and the measurements were retaken. The patient now registered a 95% on the right hand and 99% on the left. Following the one-minute exercise, the value stayed on the left and rose to 96% on the right. The cervical spine was evaluated and treatment again rendered to the muscles and the vertebral segments. The patient was instructed to continue with the home cervical traction, activation of the shoulder extensors and stretching of the pectoralis minor.

The patient was seen one week later. At this point, his grip strength had increased to 20 lbs. with his arm by his side and 50 lbs. with his arm over his head. Blood oxygen levels measured on both sides were now at 98%. At this time, further evaluation of the shoulder was performed and weakness and trigger points were found in the infraspinatus. These were treated and followed up proprioceptive neuromuscular facilitation techniques to normalize the function of the right shoulder. Following this and correction of a misalignment in the lower cervical spine, the patients grip strength was now 40 lbs. and with the arm above the head at 60 pounds

As this is written, the patient is continuing to recover. He is continuing to exercise his forearm and hand muscles, performing shoulder extension exercises and is engaged in a full stretching and flexibility exercise program for his right upper extremity group.

Conclusion

This paper was written to describe various methods of using muscle testing to determine both the site and severity of injuries. Muscle testing can be as simple as seeing if an extremity can move. Qualitative measurements of motion can be as valuable or more valuable than relative strength values. This case demonstrates a patient that has multiple sites of injury following trauma. The patient had an injury to the cervical spine, which could only be found, in a weight bearing position and not in a supine position. In addition, injuries at the thoracic outlet, elbow and wrist appear to have contributing factors to the patient's symptom pattern. Finally, coordinated therapies when applied simultaneously with the patient's cooperation will many times result in a rapid reversal of the symptom pattern.

Resources

Leaf, D., Personal Observations.

The Proper Fitting of Supports and Their Effect Upon Muscle Strength

David Leaf, D.C., DIBAK

Abstract

This paper describes the effects of pressure applied by a support, such as a lumbar, pelvic, elbow, wrist supports or of support stockings, on the strength of muscles, which are found underneath the supports.

Discussion

Supports have been advocated for both short and long-term use in the medical field in the treatment of sprain – strain type injuries. It is also a common practice to use these in individuals with circulatory problems. These constrictive stockings appear to improve return circulation from the legs. The effects of this confinement on the normal functioning of the underlying tissues are explored in this paper.

Is well established that muscles must expand when they contract. The contraction of the muscle brings the origin and insertion closer together but the muscle fibers expand during his contraction. If sufficient pressure is applied to restrict this expansion, will the muscle be inhibited and will it fail to function properly?

To examine this possibility, 25 individuals were selected between the ages of 18 and 60 who had no symptoms in their lower extremity or lumbar region. All had entered the office for upper extremity, cervical or TMJ complaints.

Procedure and Results

The following muscles of the lower extremity were tested. These included the peroneus longus and brevis, peroneus tertius and the tibialis anterior. In all of these individuals, these muscles were of normal strength at the beginning of the experiment.

A blood pressure cuff was applied in the mid calf region. The blood pressure cuff was inflated at 10-degree increments and the muscles were retested for their ability to withstand this constrictive stress. In all individuals at 10, 20, and 30 mm of pressure the muscles maintained their normal strength and resistance. When the pressure was increased to 40 mm, 19 of 25 subjects had failure of the peroneus longus and brevis muscles. In all individuals, when the pressure was 50 mm all the tested muscles failed to adapt to the testing pressure.

At this point, the cuff was deflated to test when the muscles would regain their normal response to the testing pressure. Values. The individual values started at approximately 44 mm and dropped to 37 mm of pressure.

Results were recorded as pass or fail. Failure was determined to be any decrease in response to the force of the muscle test. These tests were done with the examiner and the person being tested blinded from the pressure recordings. A gown was placed over the lower extremity so that the examiner could not see the pressure being applied. One examiner changed the settings on the cuff and instructed the testing person to perform the test. The results were then recorded. The second pat of the test began with the cuff inflated to the point of inter-

fering with the muscle function. Pressure was changed and the testor instructed to test at specific points as determined by the person controlling the air valve.

Subject	pressure at failure	pressure when muscle function returned
1	40	37
2	40	38
3	40	38
4	50	44
5	40	37
6	40	37
7	50	42
8	50	44
9	40	39
10	40	40
11	40	40
12	40	38
13	40	39
14	40	37
15	40	39
16	40	40
17	40	37
18	40	40
19	50	43
20	50	41
21	40	39
22	50	42
23	40	41
24	40	37
25	40	39

Conclusion

When applying support, especially those applied by the patient, care must be taken to make sure that the support is not sufficient to cause Inhibition of the underlying muscles.

Two further studies are currently being done. These are to determine the maximum amount of force that can be safely applied by lumbar and tennis elbow supports.
Preliminary testing shows that the same pattern of improper muscle response occurs at pre-defined values. These findings may indicate why some individuals become chronic users of supports and more prone to injury while wearing them.

In the case of supportive stockings, the failure of the muscles of the lower leg to function normally restricts the muscle action needed to move extracellular fluid into and up the lymphatic system and places the person at greater risk of falls due to the lack of normal muscle function.

Resources

Leaf, D., Personal Observations.

The Use of Manual Muscle Testing to Assess Functional Integration of High-Threshold Versus Low-Threshold Alpha Motor Neurons

James Otis, D.C.

Abstract

- Preloaded muscle tests are sensitive to the integration of low-threshold motor neurons, and by extension the areas of the nervous system that preferentially activate those neurons.
- Post-movement muscle tests are sensitive to the integration of high-threshold motor neurons, and by extension the areas of the nervous system that preferentially activate those neurons.
- Input-output relation of alpha motor neurons, selective activation of low-threshold and high-threshold alpha motor neurons, and functional implications of gamma motor neuron-muscle afferent feedback loops are discussed.

Introduction

Slow-twitch non-fatiguing muscle fibers, and the small, low-threshold **alpha motor neurons (AMN)** that control them, maintain postural muscle tone. Small, slowly-firing, low-threshold dynamic **gamma motor neurons (GMN)** innervate dynamic bag muscle spindle fibers that signal small degrees of stretch through Ia afferents. The Ia afferents send their greatest synaptic input back to the low-threshold motor neurons that control postural tone. Postural muscle tone is modulated primarily from the ipsilateral brainstem, which in turn is influenced by projections from the ipsilateral neocortex. Preloaded muscle tests evaluate the function of slow twitch, low-threshold motor units, and by extension the areas of the nervous system that preferentially activate those motor units.

Fast-twitch fatigable muscle fibers and the high-threshold AMNs that control them supply the power for fast, powerful movements. Large, quickly-firing static GMNs innervate static bag and chain muscle spindle fibers. Static bag and chain fibers contract to maintain spindle sensitivity during movement, and they signal muscle length through group II afferents. Secondary afferents send their greatest synaptic input back to the large AMNs that are primarily involved with fast powerful movements. Voluntary movements are controlled from the contralateral side of the brain. Post-movement muscle tests evaluate the function of larger, fast-twitch fatigable motor units and by extension the segmental, suprasegmental and interneuronal inputs that preferentially activate those motor units.

Preloaded Muscle Tests

Preloaded muscle tests are performed with 2 seconds of light pressure to elicit an isometric contraction prior to applying the test. This test procedure frequently demonstrates a weak muscle when non-preloaded tests do not. The test is more sensitive if the examiner uses light pressure rather than moderate or heavy pre-loading pressure.

Both preloaded and non-preloaded muscle tests require the muscle being tested to resist a quick increase of force attempting to lengthen the muscle. The test causes quick stretch, a postural perturbation that is signaled

to the nervous system by primary afferents that activate primarily low-threshold AMNs.
What might cause a muscle to weaken in a preloaded context and be strong without the preload? Isometric contractions cause greater Ib inhibitory impact on low-threshold than on high-threshold motor neurons. In the case of reduced descending facilitation from the brainstem, the preload inhibitory input is enough to cause failure of the low-threshold activation that is necessary to resist the test pressure. The lower the preload pressure the lower the percentage of high-threshold AMNs recruited to resist the preload pressure, and the lower the percentage of high-threshold AMNs available to resist the final test pressure.

To summarize, descending monoaminergic projections activate persistent inward currents in the dendrites of motor neurons, which in turn contribute tonic activation to low-threshold AMNs and GMNs and regulate postural muscle tone. Preloaded muscle tests are sensitive to the integration of low-threshold motor neurons, and by extension the areas of the nervous system that preferentially activate those neurons.

Decreased output of brainstem monoaminergic projections (often secondary to decreased neocortical output) results in characteristic postural changes. Decreased neocortical output typically causes decreased tone of posterior compartment muscles above T6 (arm extensors and external rotators) and anterior compartment muscles below T6 (leg flexors, leg adductors, foot dorsiflexors, and internal rotators). This pattern is sometimes called a **soft pyramidal pattern of weakness** because it is associated with normal or decreased tendon reflexes and is caused by loss of modulation from the ipsilateral brain stem. Soft pyramidal muscle weakness is more frequently observed with preloaded muscle tests than with other types of muscle tests.

Post-Movement Muscle Tests

Sometimes a muscle is strong in a test situation that does not involve an immediate prior movement, but fails to resist test pressure after it has been lengthened or shortened. Post-movement muscle tests are sensitive to the condition of high-threshold AMNs and GMNs and by extension, the segmental and suprasegmental inputs acting on them.

Fast-twitch, fatigable muscle fibers and the high-threshold AMNs that control them supply the power for fast powerful movements. Large, quickly-firing GMNs (static GMNs) innervate static bag and chain fibers in the muscle spindle cell that contract to maintain spindle sensitivity during movement. Group II afferents signal muscle length more strongly to the high-threshold AMNs and GMNs than to low-threshold AMNs and GMNs. The contralateral side of the brain controls this movement-generating system.

Post-movement strength tests are performed after the muscle has been lengthened or shortened through at least a quarter of its range of motion. The patient is asked to exert a strong force. The examiner resists and then adds additional test pressure in the direction of lengthening the muscle. The examiner assesses the patient's ability to resist the added pressure.

The post-movement test conditions cause increased corticospinal and rubrospinal drive to the ventral horn. Corticospinal and rubrospinal pathways excite high-threshold AMNs and static GMNs and inhibit low-threshold AMNs and dynamic GMNs.

If high-threshold AMNs do not have adequate stimulation from corticospinal and rubrospinal projections the patient is unable to resist the added test pressure and the muscle lengthens. (This is true whether the patient is initiating a high force test post-movement or not)

If high-threshold neurons do not have adequate stimulation from secondary afferents, the patient is unable to resist the added test pressure and the muscle lengthens. (The larger the movement, the more important the effect of secondary afferent integration on muscle function) Two conditions can cause decreased stimulation of high-threshold AMNs from secondary afferents.

- Decreased drive to the GMNs from corticospinal and rubrospinal projections causes decreased secondary afferent activation.
- An increased ratio of norepinephrine to serotonin in the cord directly inhibits GMNs and facilitates presynaptic inhibition of secondary afferent input to AMNs and GMNs.

Alpha motor neuron physiology

Every part of the nervous system involved in the control of muscle function must do so by acting directly or indirectly on AMNs. Motor neurons are the "final common pathway" in the control of movement and are among the most highly studied neurons in the central nervous system. They have large cell bodies that are easily identifiable, their output targets are easy to identify and their output can be measured in a number of ways.

An alpha motor neuron and the motor fibers it innervates are a **motor unit**. Motor units within each muscle have a wide range of properties. Motor units can be classified as **type S** (slow twitch, low force, non-fatigable), **type FR** (fast-twitch, intermediate force, intermediate fatigue time) and **type FF** (fast twitch, high force and quickly fatigable) Force output of these motor units varies by 100-fold, fatigue resistance varies by 10-fold, and contraction speed varies by 5-fold.[2]

The intrinsic properties of the AMNs vary as well. Low-threshold AMNs innervate a relatively fewer number of the smaller, slow twitch muscle fibers. They have smaller cell bodies, thinner axons, and slower conduction times. They have a higher input resistance, and need less synaptic current to initiate an action potential. (The higher the input resistance, the greater the change of voltage elicited by any current that reaches the soma, and the less current is needed to bring the neuron to threshold.) They have a longer afterhyperpolarization and therefor a slower frequency of firing.[11]

High-threshold AMNs innervate a relatively larger number of the larger, fast-twitch fatigable muscle fibers. They have larger cell bodies, thicker axons, and faster conduction times. They have a lower input resistance, and need more synaptic current to initiate an action potential. They have a shorter afterhyperpolarization and therefor a higher frequency of firing.[11]

Alpha Motor Neuron Recruitment Pattern, Early Studies

When the membrane potential of the motor neuron moves from its resting value to a threshold value, the motor neuron fires an action potential and is said to be recruited**.** The numbers of motor units that are firing and the rate at which they fire determine the strength of a muscle contraction. The order in which AMNs begin to fire during any given task is called the **recruitment pattern**. In the 1960s researchers developed the principle of **orderly recruitment** with a series of studies with anesthetized cats.[1] AMNs were isolated and currents were injected into the cell body or the dendritic tree, or presynaptic neurons were stimulated. The amount of current reaching the cell body was compared to the rate of action potentials elicited.

Each cell has a unique (and later discovered to be changeable) relationship between the amount of injected or synaptic current and its firing rate. It usually takes approximately 1.5 times as much current to elicit a steady repetitive discharge as to elicit one action potential. In the absence of modulation described later there is usually a linear relationship between synaptic current and the firing rate of the motor neuron.

Early researchers concluded that AMNs are always recruited in order of increasing size, and described this as a process of orderly recruitment. For a given amount of current reaching the cell body, smaller AMNs began firing sooner than larger AMNs. Two functional advantages were originally postulated. With orderly recruitment, motor units are recruited in order of increasing fatigability, so that fatigable units are reserved for brief forceful contractions. A second postulated advantage was that the relative precision of force control is the same at all force levels. Each newly recruited unit contributes approximately the same percentage increment to the total force of the muscle at that point in the contraction.[1]

Later Recruitment Studies; Selective Recruitment

Later work with decerebrate, or moving cats demonstrated that the principle of orderly recruitment is a useful, but overly simple model. It does not take into account distribution patterns of synaptic input within the motor neuron pool or modulation of alpha motor neuron function by reticulospinal projections. Motor neurons are not simply recruited in order of increasing size.

AMN recruitment is controlled by pre-synaptic input from both segmental and descending systems, each with a different magnitude and distribution of input to low- and high-threshold motor neurons. Binder, Heckman and Powers[2] report that researchers measured the effective synaptic current of six different input systems to the anesthetized cat. **Effective synaptic current** is defined as the amount of current reaching the soma during high frequency repetitive stimulation of presynaptic cells. Researchers found that:

- Rubrospinal and corticospinal input facilitates high-threshold motor neurons and inhibit low-threshold motor neurons.
- Group Ia afferent input is larger to low-threshold motor neurons.
- Group II afferent input is larger to high-threshold motor neurons.
- Group Ib afferent input inhibits low-threshold motor neurons, but facilitates high-threshold motor neurons.
- Recurrent inhibition from Renshaw cells and reciprocal Ia inhibition is distributed uniformly between low- and high-threshold motor neurons.
- Input from the lateral vestibular nuclei preferentially stimulates high-threshold motor neurons.

Synaptic Integration; Drive and Modulation

There are two major types of synaptic influence on motor neuron discharge, drive and modulation.[10] Driving currents are provided by input from fast-acting ionotropic synapses that summate spatially and temporally in the cell soma. Driving current does not change the neuron's intrinsic properties of input resistance and duration of afterhyperpolarization, and driving currents from different sources summate in a close to linear fashion. (If distributed evenly within the motor neuron pool, driving current produces an orderly recruitment)

Modulating synapses alter the neuron's intrinsic properties. Neuromodulators acting through metabotropic receptors can increase membrane resistance by 50% and shorten the duration of afterhyperpolarization allowing an increased frequency of firing. They alter both sub-threshold and supra-threshold behaviors of the AMNs.

Modulating synapses alter the neuron response to driving currents. For example, Ia afferent input elicits very different responses in the cord depending on the presence of monoamines. The same amplitude of Ia input generates 2-3 nA of effective synaptic current in anesthetized animals and 12-17 nA of synaptic current in decerebrate animals.[3]

One of the primary ways that modulators create changes in the target neurons is by triggering **persistent inward currents (PICs).**[5] PICs depolarize the cell and create a long-lasting change in membrane potential known as a **plateau potential**. The plateau potential makes the cell easier to activate, and it sometimes generates self-sustaining firing in the absence of continued synaptic input. The PIC and its associated plateau potential last from a second or so to more than a minute. Low-threshold AMNs generate stronger, longer-lasting PICs than high-threshold AMNs. Some plateau potentials decay spontaneously after a period of time and some are stopped by a burst of inhibitory input.

Motor neurons often exhibit **bistable behavior** in which brief periods of excitation and inhibition can toggle self-sustained firing on and off.[4] Low-threshold AMNs **are fully bistable**. They can produce self-sustaining firing for many seconds up to a minute. High-threshold AMNs are **partially bistable**. They can generate at most 1-2 seconds of self-sustaining firing.

Muscle Spindle Cells

Muscle spindle cells provide information to the central nervous system about muscle length and changes of muscle length. There are three important functional parts of the muscle spindle cell; the **intrafusal fibers**, the **GMNs** that innervate the contractile polar sections of the intrafusal fibers, and the **sensory receptors** that originate in the central non-contractile parts of the intrafusal fibers.

Muscle spindle cells contain three types of intrafusal muscle fibers (dynamic bag, static bag, and chain) enclosed within a spindle-like (or fusiform) fluid-filled connective tissue capsule situated in parallel with the longer, stronger extrafusal muscle fibers that do the work of the muscle. The length of the spindle and the length of the intrafusal fibers within the spindle changes in parallel with the length of the extrafusal fibers. Each intrafusal fiber has a contractile portion and a non-contractile sensory portion. The sensory portion increases its firing rate when it is stretched. Tension in the contractile portion of the intrafusal fiber effects the degree of stretch in the sensory portion of the fiber. The sensory portion of the spindle is stretched when the entire spindle lengthens and when the contractile portion of the intrafusal fiber contracts causing stretch of the non-contractile sensory portion.

Gamma Motor Neurons

The motor innervation of the intrafusal fibers comes from small motor neurons called gamma motor neurons to distinguish them from larger AMNs that innervate extrafusal fibers. Like AMNs, GMNs show variation in size, frequency of firing, presynaptic pools, and output targets. Traditionally two types of GMNs have been recognized, **static** and **dynamic**. Recently it is clear that there are two types of static GMNs.[13]

Dynamic GMNs are smaller, and have a lower frequency of firing than static GMNs. They innervate the slow, weakly contracting dynamic bag fibers. The contractile portion of the dynamic bag does not contract. It simply stiffens. This increases the sensitivity of the dynamic bag to stretch. The sensory portion of the dynamic bag activates primary afferents that have an increased firing rate during the first few degrees of muscle stretch.

Static GMNs are larger and have a faster frequency of firing. They innervate static bag and chain fibers. Static GMNs can activate static bag or chain fibers independently, or both together. Different populations of static GMNs are active at different parts of a muscle movement cycle.[13]

Intrafusal Fibers

Each intrafusal muscle fiber has a characteristic type of contraction.[13]

Dynamic bag fibers have weak, slow contractions. They have a slow frequency of firing, and a slow tetanic fusion frequency of less than 30 Hz. They do not actually shorten, but they stiffen, making the contractile polar portion of the dynamic bag more resistant to stretch so that the middle sensory portion of the dynamic bag stretches more with each degree of spindle stretch. This causes a higher rate of firing for the primary afferent with its annulospiral ending on the dynamic bag.

Static bag fibers have a higher frequency of firing than dynamic bag fibers, and less than chain fibers. Static bag tetanic fusion frequency is about 30 Hz. They do contract and can change the bias (tonic firing rate) of the primary and secondary afferents that have sensory endings on the static bag. They do not contract quickly enough to prevent unloading of the sensory portion of the bag while the muscle is shortening. Static bag fibers do shorten enough to cause resumed activation of the primary and secondary afferents that have sensory endings on the static bag once the muscle is resting in the new shortened position.

Chain fibers contract quickly and powerfully. Their tetanic fusion frequency is greater than 100 Hz. They contract quickly enough to prevent unloading of the sensory portion during muscle shortening, but as they fire at unfused tetanic frequencies they drive the primary afferents with annulospiral endings on the chain fibers causing a distorted stretch response in the primary afferents.

To summarize, dynamic bag fibers (innervated by dynamic GMNs) control the stretch sensitivity of primary afferents. The primary afferent stretch response is phasic and does not last more than a few milliseconds. Because the dynamic bag fibers contract slowly they do not maintain the stretch sensitivity once the muscle has moved. The static bag sets the bias or tonic-firing rate for both primary and secondary afferents. It does not contract quickly enough to prevent unloading during shortening. Those static GMNs that innervate static bag fibers alone are best suited to set the bias of both primary and secondary afferents. Static bags and chains together (and the static GMNs that innervate them) are best suited to maintain spindle sensitivity during muscle shortening.

Muscle Afferents

The central portion of each intrafusal fiber contains a non-contractile sensory section that activates primary or secondary afferents. There are two types of sensory endings in the muscle spindle. **Primary endings (annulospiral)** are located in the central portion of dynamic bag, static bag, and chain fibers. They activate large fast primary (group 1a) afferents. They signal rapid changes of length, and to a lesser extent resting length of the muscle.

Primary afferents have two sensory branches; one to the annulospiral ending on the dynamic bag and the other to annulospiral endings on static bag and chain fibers. The frequency of the primary afferent matches the rate of the sensory branch with the highest rate of firing. This changes at different stages of a movement cycle. Primary afferents excite low-threshold AMNs more than high-threshold AMNs and they have relatively little input to GMNs

Secondary endings (flower spray) are located in the central portion of static bag and chain fibers. They activate group II (secondary) afferents. Secondary afferents have one or more sensory branches with endings on static bag, chain fibers or both. They signal muscle length and the degree of intrafusal fiber contraction (spindle bias). The sensory branch (from the static bag or the chain) with the highest firing rate determines the firing rate of the secondary afferent. This changes in different phases of a movement cycle.

Group II afferents have disynaptic, trisynaptic and polysynaptic input to AMNs and GMNs, and as recently suggested, some monosynaptic input to AMNs and GMNs as well. Secondary afferents have greater input to high-threshold AMNs than low-threshold AMNs. The effect of secondary afferents on GMNs is strongly influenced by monoaminergic modulation from the brainstem as described below.

Alpha-gamma co-activation

When a muscle shortens the muscle spindle cells and the intrafusal fibers within the spindle shorten as well. This tends to unload the central sensory part of the spindle and reduce afferent input to the cord. To counteract this tendency, static GMNs cause contraction of static bag and chain fibers to maintain tension in the central sensory portions of the intrafusal fibers.

Voluntary movement initiated through corticospinal and rubrospinal pathways activates AMNs and GMNs. The pathways controlling voluntary movement are distributed preferentially to high-threshold AMNs and to static GMNs. Static GMNs are activated slightly out of phase to high-threshold AMNs.

Cord Integration of Group II Afferent Input

Secondary afferents send collaterals to a large number of segmental and suprasegmental destinations. Signal transmission to each destination is independently modulated by presynaptic inhibition, and by excitatory and inhibitory input to postsynaptic neurons. Information is routed to one destination or another, a process that is strongly influenced by monoaminergic modulation from the brainstem.

Spinal interneurons are modulated and interneuronal pathways are reorganized during voluntary movements. Spinal reflexes are adjusted to assist rather than counteract the execution of planned movements.[8] The same stimulus evokes different responses in different situations, including different phases of a movement cycle such as locomotion.

Group II afferents project to the dorsal horn lamina 4, the intermediate zone lamina 5 and 6 and the ventral horn lamina 7 and 8.[8 9] Ventral horn targets include AMNs and GMNs. Intermediate zone targets include interneurons that are immediately premotor to AMNs and GMNs. Secondary afferent projections to both intermediate and ventral horn targets are subject to presynaptic inhibition from GABAergic dorsal horn interneurons.[9]

Serotonin and Norepinephrine Modulate Afferent Input

Serotonin and norepinephrine have several opposing actions in the cord. Serotonin facilitates mono and di-synaptic pathways from secondary afferents through the intermediate and ventral horn to motor neurons. Norepinephrine facilitates polysynaptic pathways with integration in the dorsal horn en route to intermediate and ventral horn targets.[9]

Both serotonin and norepinephrine have direct excitatory action on AMNs but they have opposite effects on secondary afferent input to GMNs.[9]

Serotonin enhances secondary afferent input to GMNs. It does this with a combination of direct excitatory action on GMNs, facilitation of intermediate zone interneurons that are active in di-and tri-synaptic pathways, and inhibition of dorsal horn GABAergic interneurons that presynaptically inhibit secondary afferent terminal projections to the intermediate and ventral horn sites.[9]

Norepinephrine depresses secondary afferent input to GMNs. It does this with a combination of direct inhibitory action on GMNs and inhibitory action on intermediate zone interneurons that are active in di-synaptic pathways.

Positive Feedback Loop between Secondary Afferents and Gamma Motor Neurons

Activity of static GMNs and secondary afferents forms a positive feedback loop that can be modulated at the step of afferent activation of static GMNs. Increased gamma motor neuron activity causes more afferent activity. This is a potent effect. Increased afferent activity causes gamma motor neuron activation. This is a weaker effect and it is modulated by the ratio of norepinephrine and serotonin in the cord[7] Serotonin enhances the positive feedback loop and norepinephrine inhibits the loop.

Serotonin and Muscle Tone

Serotonin and its receptors are distributed throughout the CNS. There are billions of cells in the central nervous system but only 10-20,000 that produce serotonin. Cells that produce serotonin are all located in the brainstem from the medulla to the mesencephalon.

A rostral group of serotonergic nuclei project to the cortex, and a caudal medullary group project to the spinal cord. Jacobs and his research group[6] implanted micrometers in order to study the function of serotonin in cats. He reports that the primary role of the medullary serotonergic system appears to be increasing motor tone and facilitating repetitive motor activity. Serotonin inhibits nociception and increases sympathetic nervous system activity in order to support its primary function of increased motor tone. Serotonin levels decrease during sleep, and fall to zero during periods of REM sleep, when muscle tone is profoundly reduced

Serotonergic neurons in the medulla are sensitive to carbon dioxide and/or pH.[6] Increased carbon dioxide (3%, which is fairly sensitive) causes increased serotonergic activity and increased breathing. Decreased levels

of carbon dioxide cause decreased serotonergic activity in medullary neurons that project to the spinal cord. There does not appear to be phasic activity of serotonergic neurons related to the respiratory cycle.

Respiration and Muscle Tone

If the patient takes six or seven deep rapid breaths, they temporarily decrease the levels of carbon dioxide in the blood stream, and often show widespread preloaded muscle test weakness (described previously) and post-shortening muscle test weakness (described later). If the patient holds their breath for ten seconds they temporarily increase the levels of carbon dioxide in their blood stream, and increase the levels of serotonergic activity in the cord, and they often show widespread weakness after lengthening the muscle to be tested.

Low CO_2 tends to cause decreased activation of AMNs as evidenced with preloaded muscle test weakness and post-shortening muscle test weakness, but it has the opposite effect on other neurons. Hyperventilation tends to cause increased neuronal excitability. Low CO_2 causes an increase in pH, which causes decreased free calcium because of increased association with binding protein. Low calcium causes voltage gated sodium channels to open with lower levels of activation and nerves become more excitable.

Shortening Versus Lengthening Pre-Test Movements

As a muscle is shortened gamma drive is initiated to maintain an appropriate bias in the muscle spindle. Inadequate gamma drive results in off-loading of the spindle and reduced afferent input to the cord. The cord reflexively acts as if the muscle is shorter than it actually is and stops trying to shorten it. Inadequate gamma drive results in post-movement weakening after the muscle being tested is shortened.

Excessive gamma drive causes excessive bias in static bag fibers and chain fibers of the muscle which is shortening (the antagonist of the muscle which is lengthening), and increased secondary afferent input to the cord. The cord reflexively acts as if the muscle being shortened is longer than it actually is and reflexively tries to get it to contract more. This causes reciprocal inhibition of the muscle that is lengthening, the muscle that will be tested. Excessive gamma drive results in post-movement weakening after the muscle being tested is lengthened.

Clinical correlations

The preloaded muscle test is an effective way to evaluate postural influences on muscle tone. This test is sensitive to the integration of low-threshold motor neurons, and by extension the areas of the nervous system that preferentially activate those neurons.

The post-movement test is an effective way to evaluate the body's ability to effectively generate and control movement, and to evaluate corticospinal and rubrospinal influences on muscle tone.

Many patients have pre-loaded weakness, often in a soft pyramidal distribution, on one side of the body, and post-shortening muscle test weakness on the other side of the body. The side of pre-loaded muscle test weakness correlates with signs of decreased hemispheric function such as sluggish pupil constriction, palatal paresis, increased ratio of retinal vein-to-artery size, and increased blood pressure.

Patients with abnormally increased muscle tone driven by the contralateral side of the brain typically have post-lengthening muscle test weakness, especially in flexors. Post-lengthening weakness correlates with signs of increased contralateral mesencephalic activity such as brisk, slowly fatiguing pupil contractions.

Conditions of transneural degeneration complicate the picture. Refer to the article by Walter Schmitt for a review of transneural degeneration.[12] When an area of the nervous system is in the initial stages of degeneration it frequently shifts closer to its threshold of activation and it fires spontaneously or in response to trivial stimulation. It activates easily, but it fatigues quickly.

Many patients have transneural degeneration of the purkinje cell system of the cerebellum. When the purkinje system is in the early stages of degeneration vestibular stimulation such as a few bounces on a mini-trampoline, or closing the eyes and moving the head back and forth often causes a temporary right to left reversal of one of the patterns described above. Treatment should be appropriate for the condition.

Summary

Muscles serve both postural and movement-generating functions. They have different fiber types and different controlling systems to accomplish those functions. Pre-loaded muscle tests and post-movement muscle tests are used to assess these functions and the areas of the nervous system that control them.

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Division II

Critical Review

Applied kinesiology and Proprioception: A Non-Invasive Approach to Equilibrium and Balance Disorders

Scott C. Cuthbert, D.C.

Keywords or Terms

1. On Proprioception
2. Cerebellar integration of proprioceptive input
3. Proprioception's importance to Chiropractic
4. Proprioceptive problems in children
5. AK and the Proprioceptive Systems
6. Proprioceptive Testing in Applied Kinesiology
7. Applied kinesiology's proprioceptive treatment method: the motor system's contribution to the sensory system
7a. Case Histories
8. Afterword: A Note On Oliver Sacks

Abstract

Proprioception, equilibrium, and balance are at the core of human functioning. It is the first system to be developed in utero and is myelinated at birth, providing the fetus with a sense of direction and orientation inside the womb. It is in place at the very beginning of human life in order to help cope with the problem of gravity, which we will encounter in its full force when we are born, and this *problem with gravity* will not cease to challenge us until we die.

1. On Proprioception

The term **proprioception** was derived by Sherrington (1906) from the Latin *proprius* to refer to the organism's perception of sensations that originate in receptors that are stimulated by it's own movement. Sherrington identified the muscle spindles, mechanoreceptors in joints, and vestibular receptors as the primary sources of proprioceptive inputs.[1] The mechanoreceptors feed into the nervous system information about movement, tension and pressure. The mechanoreceptors are present in all vertebrates and in all tissues in which active or passive movements occur. These include the skeletal muscles, bones, joints, ligaments and tendons and their associated capsules and sheaths; the skin; the internal ear; the eyes; the digestive tract; the respiratory, cardiovascular and genitourinary system.

In general, mobility involves skeletal muscle and bone to provide the power and fulcrum; metabolic processes to provide energy for power; blood circulation to distribute the energy source; external and internal respiratory processes to support metabolism; and visual, vestibular, kinesthetic, proprioceptive, auditory and olfactory senses to provide information as to where to go and how things are going when the organism is in motion. The applied kinesiology chiropractic method provides numerous methods for the diagnosis and treatment in each of these specific areas of body function.

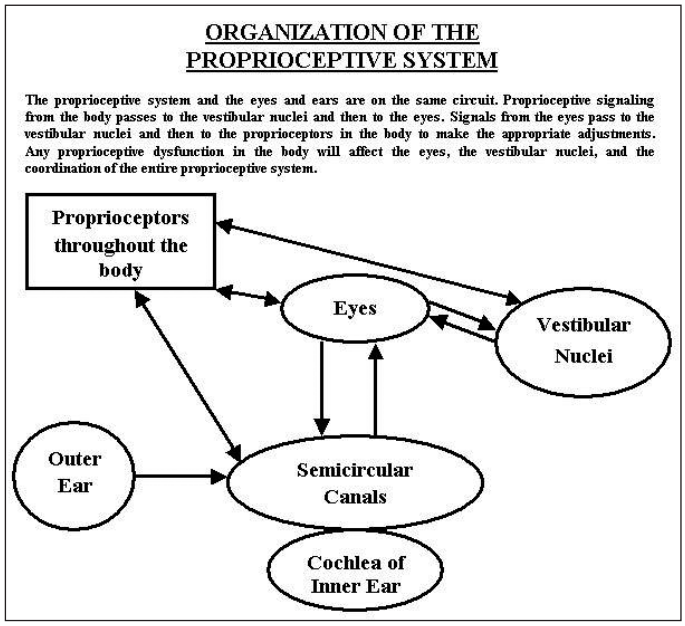
Body posture and balance can be adversely influenced by dysfunctions affecting the central nervous system, the peripheral nervous system, the eyes, the ears, and the musculoskeletal system where proprioceptor and mechanoreceptor sensory organs lie. Defects in any of these tissues can lead to diminished postural function and increased instability, and eventually to trauma from falling. There is evidence that multiple factors can adversely affect the postural mechanism and that these factors are cumulative.[2] One of the causes of the chiropractic subluxation may be found in faulty proprioceptive mechanisms in our patients.

This paper focuses on proprioceptive communication within the nervous system and expands the concept that a breakdown in communication may have a role to play in dysfunction and disease. Part of this discussion will be the traditional chiropractic hypothesis that irritation and dysfunction within the somatic structures (and other soft tissues) of the body might be a contributory factor to neural "confusion" and hence homeostatic imbalance and physiological disorganization.

If muscle proprioceptors are signaling improperly, they will send incorrect messages through the afferent sensory nerves into the spinal cord and cerebellum. When the CNS responds to this aberrant afferent information, the motor response and signals will be incorrect producing improper motor movement, tension, timing, and posture. As a result, some muscles will be hypertonic and others will be hypotonic. This results in structural misalignment of the body, uncoordinated movement, and pain.

The proprioceptive, auditory and visual perceptual systems influence numerous motor mechanisms. In both listening and looking, motor functions become increasingly involved in enhancing the function of the auditory and visual mechanisms. The head will turn so that sound and light are received as effectively as possible. It is no longer appropriate to think of isolated sensory modalities in relation to proprioceptive function. That is not the way the brain functions. It functions as a whole. This point is emphasized because applied kinesiology theory believes that to resolve biomechanical, locomotor, postural and sensory problems, many areas of the body must be examined and corrected in order to achieve long-lasting symptomatic relief. Our global view of integrated biomechanics and neurophysiology is one of the major differences between chiropractic (and especially applied kinesiology) practice and that of many of the other manipulative and medical professions.

These proprioceptive systems integrate and overlap with one another. The eyes reinforce what the skin perceives and the joints of the hand and arm are moving toward. The different proprioceptive senses therefore enrich and verify one another, creating a multi-sensory perception of our environment. We use this multi-sensory perceptive field of tensile simultaneity to interact effectively with the world. When the input from these sensory systems conflict or a discrepancy exists between any of the sensory perceptions, it may affect the individual's ability to interact with their environment. The proprioceptive system's interaction with the nervous system is still somewhat mysterious, but seems to involve large areas of the entire brain. This has been referred to as the holographic theory of brain function.



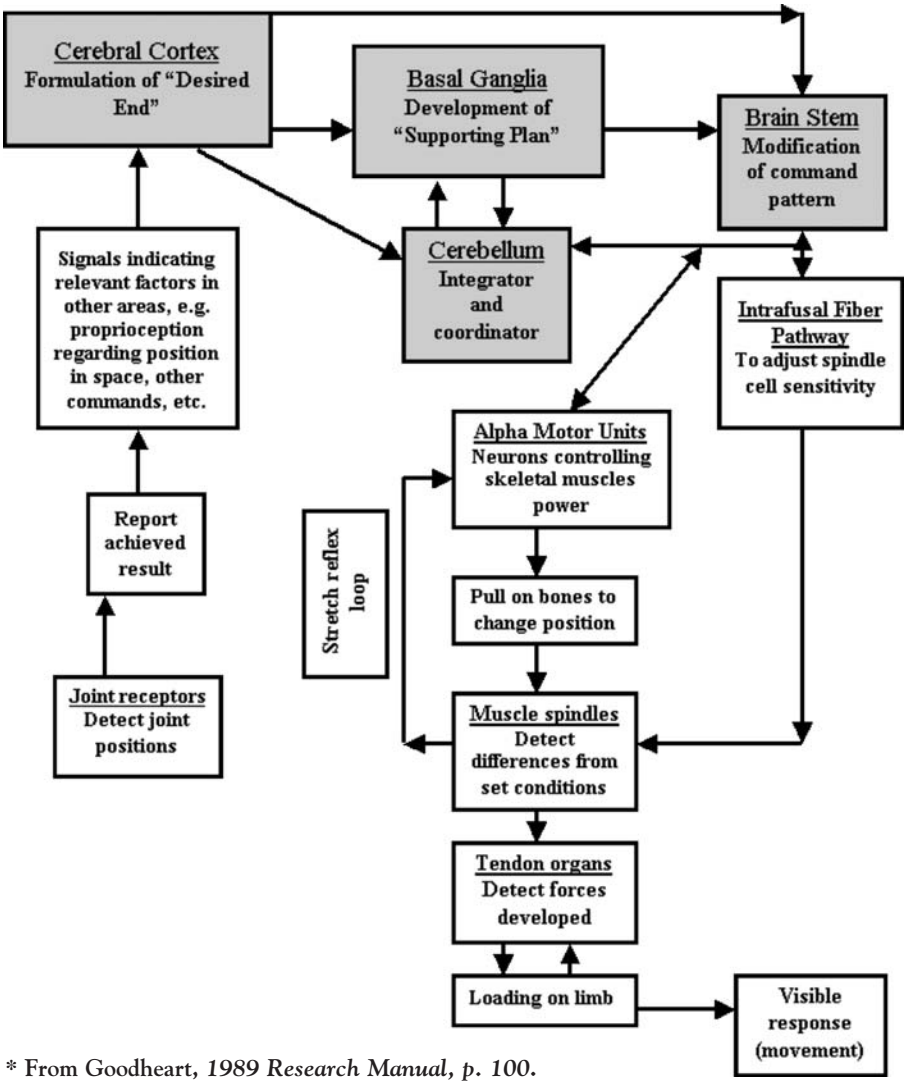
Central to the AK concept of neurological organization is the consideration that the senses of seeing, hearing, smelling, tasting, and feeling, are not simple, specific sensations but rather are sensory systems that are closely interrelated among themselves and intimately linked with motor functions.

Sperry has described the primary function of the brain as "essentially the transforming of sensory patterns into patterns of motor coordination." He feels that *perception merges into movement* so that it cannot be said where one ends and the other begins. In relationship to AK evaluation and treatment methods, Sperry points out that "Motor adjustment, rather than stimulus patterns or the contents of subjective experience, figures predominantly as a proper frame of reference for understanding the organization, meaning, and significance of brain excitation."[3] The primary function of the brain is to translate sensory impulses into meaningful information and to organize an appropriate motor response. The sensory portion of this equation as far as movement is concerned is proprioception, the focus of this essay.

2. Cerebellar integration of proprioceptive input

Ontogenetically, the cerebellum began as a derivative of the fifth (trigeminal) and eighth (vestibular) cranial nerve nuclei. This origin is significant in any interpretation of the role of the cerebellum in human function today. Its close connection with the ocular, the vestibular, and the mechanoreceptor systems in the body, receiving information from and sending information back to these proprioceptive sensory organs imply involvement of that portion of the cerebellum functioning with them.

The cerebellum governs conscious proprioception, intrinsic muscle tone, balance, and posture. Simply put, the cerebellum governs biomechanics. Thus, problems in proprioception anywhere in the body will have an effect throughout the body and not only where the proprioceptive dysfunction exists in the area of tissue injury.



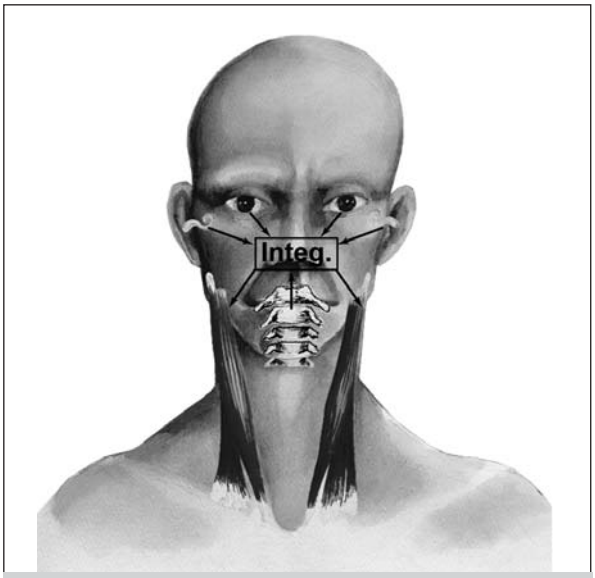
* From Goodheart, *1989 Research Manual, p. 100.*

Sensory impulses arising from musculoskeletal receptors, especially the muscle spindle, travel to the cerebellum to contribute to the regulation and coordination of motion. This arrangement also provides an adequate anatomical route for inhibitory influences from these receptors on the reticular activating system. The reticular activating system, in turn, modifies indirectly the ascending proprioceptive flow through its effect on cortical mechanisms. The reticular activating system may increase the arousal of the cortex; the cortex, in turn, increases the excitatory state of the descending reticular activating system and the latter system influences the muscle spindles which are a

main contributor to upward proprioceptive flow. This carefully regulated and balanced system of nervous circuits gives our movements a smooth action.

One of the more important neurological principles here is that any major neural structure receiving sensory input from many areas is also apt to have widespread influence over the rest of the brain. This is why meningeal, cranial nerve, and upper cervical nerve corrections may have such widespread influence on the nervous system. Multiplicity of input usually means convergence of input. The brainstem and midbrain (where the cranial nerve nuclei are located) are good examples of structures to which the principle of convergence is applicable. The nonspecific systems in these areas receive sensory input from many sources (proprioceptors, mechanoreceptors, visual and vestibular receptors, among others) and in turn have a widespread influence over organization of nervous system function by the rest of the brain. Perhaps most important, the proprioceptive input from the muscles of the body may be providing a unifying and coordinating role in relation to all other sensory input. The most commonly reported sensory modalities showing convergence are visual, auditory, olfactory, somesthetic, and vestibular.

Quoting Goodheart: "The only output (efferent) channel of the cerebellum is via the Purkinje cells which discharge into the cerebellar nuclei, Deiter's nucleus, the bulbar reticular formation, and the eye muscles (this is what led to E.I.D.)"[4]



Proprioceptive Integration.
All of the muscular and tendinous and osteoarticular mechanoreceptors play an important role in proprioception. Other proprioceptive receptors include the oculomotor, baroreceptor, plantar, and vestibular receptors throughout the body. The postural and proprioceptive systems are so complex that many of its connections are still unknown. The localization of the tissues causing proprioceptive dysfunction can be determined using applied kinesiology methods.

* Picture courtesy David Walther, D.C. Systems D.C., © Pueblo, CO 81004

It is clear that the cerebellum is well situated to influence most if not all of the neural activity we are evaluating using the procedures described in this paper. Furthermore, since the cerebellum is so easily influenced by sensory input, the entire nervous system can be influenced through the cerebellum during chiropractic therapies that affect proprioceptive sensory function. Applied kinesiology's evaluation and treatment of the cranium, jaw, spine, pelvis, extremities and other soft tissues frequently improves many of the proprioceptive and cerebellar tests that will be discussed in this paper.

The proprioceptive tests described in this essay are also used in the medical and neurological evaluation of the cerebellum.[5]

3. Proprioception's importance to chiropractic

For voluntary movements to be well timed, accurate, and painless, they require coordinated tactile, visual, and proprioceptive information about the movement in progress. Locomotion should be a stable cycle generated by sensory links between the musculoskeletal system, the nervous system and the environment.[6] Without adequate sensation, ongoing function is limited and poorly controlled. Voluntary movement depends upon integration of the motor and sensory systems. MMT allows a physician to evaluate this interaction with a method distinctly tailored to monitor precisely this. Sensory information is necessary for the control of movement and is used to correct errors through feedback and feed-forward mechanisms.[7] Any problem or confusion within the sensory

system may affect the guidance systems for movement, leading to inefficient muscular activity for any task required.

Posture is the product of an integrated orchestration between the sensory and motor systems of the body.[8] Peripheral sensory systems provide an internal representation of the outside world. Diseases or dysfunctions affecting sensory systems, central nervous system control systems, motor systems or the structural elements of the body (that have tissue continuity with all the others mentioned), can lead to progressive failure of the postural mechanisms that will manifest as postural embarrassment and failure on proprioceptive testing.

The plasticity of the nervous system allows us to compensate for degenerative changes in one system, but there is a limit beyond which failure of the postural motor system must occur. It is at this point of breakdown and multi-sensory system failure that we begin to treat many of our patients in the clinic.

A single event (such as pain signals arising from damaged tissue) can have widespread influence throughout the rest of the nervous system and the consequences of the reaction to that event can cascade through many levels of function and behavior.[9] Clinically we find that even though the tissue injury may have been to a small, discreet area, it is possible to observe changes throughout the body.

It is well accepted that alterations in the function of the sensory system may impede postural stability. For example, distortions in the proprioceptive information from diseased joints such as an arthritic knee or spondylitic vertebrae will affect the individual's perception of position.[10] Diseases affecting cutaneous afferent fibers, such as in diabetic neuropathy, may interfere with information about motion coming from the soles of the feet.[11] It is an accepted biological fact that appropriate muscle tone and tension are necessary for skeletal structures to be stable, and any condition that alters the tone of the muscles leads to instability in the structure during activity. Faults can appear at any level of the controlling system of muscles – on the sensory, the integrative, or on the motor side.

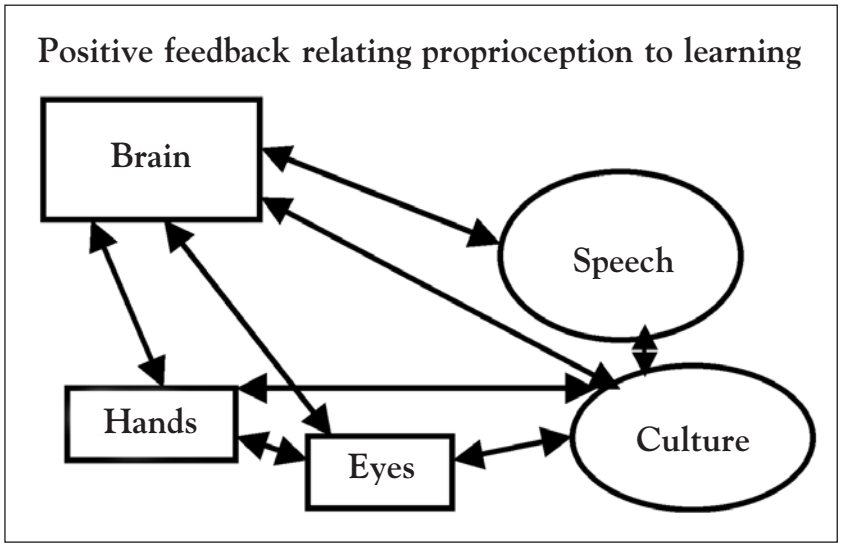
There are many pathological processes affecting the neural control of movement (such as CVA, MS, traumatic denervation, Parkinson's disease, any many others). These are beyond the scope of this paper. What will be discussed are other reasons for muscle action to be inappropriate or inefficient. These "less serious" conditions are placed, in applied kinesiology's epistemology, under the umbrella term **functional disorders**.

"Functional" implies that the underlying neural tissue is "normal" but that the information being processed is not optimal for the patient's functional life and can be improved to more homeostatic patterns.

4. Proprioceptive problems in children

Many children with learning disabilities will also have subtle balance and coordination impairments, which can be discovered by stressing multiple sensory and proprioceptive systems at once. Discovering and correcting these postural and muscle imbalances in children improves their motor, sensory, and integrative capacities enabling them to learn, to move, and to function physically and mentally in a more satisfactory manner.

Asking the seated child to "look up over your head and close your eyes" will often cause a child with proprioceptive dysfunction and neurologic disorganization to fall backwards. Hautant's test will be positive in such a child. During Freeman Wyke testing, TL to the appropriate sensory receptor area producing the proprioceptive dysfunction will improve the child's balance. Another test involves sitting the child at a table and giving him a task, such as drawing a house or adding numbers. Once the child is involved in the task, suddenly call his name or make a distracting sound. Often, the child will lose his balance in the chair. This is similar to an exaggerated startle response. The many behavioral and postural clues to be looked for in children with proprioceptive and learning disabilities have been written about extensively.[12-15]



Postural instability in children may contribute to various learning and behavior problems, including attention deficit disorder and complex developmental disorders. Many children who fall within these categories will demonstrate significant posture and balance dysfunctions when carefully tested. More often than not, the postural deficit is related to a biomechanical dysfunction, which can be addressed with the proper manipulative therapy.

The concept of and diagnosis for neurological disorganization explains these phenomena and points toward the therapy needed. These children frequently have related problems in a variety of areas including psychosocial, motor, and intellectual skills. Neurological disorganization theory attempts to explain the relationship between these neuro-anatomical (sensory and motor) and behavioral deficits within the nervous system when they cannot be attributed to frank neurological damage or abnormalities (e.g. cerebral palsy, mental retardation, traumatic brain injury, peripheral sensory loss).

Apraxia, for example, is a disorder of the sensory portion of the nervous system interfering with the ability to plan and execute skilled or non-habitual motor tasks. Usually, there is some inability to relate the sequence of the motions to each other. In the classic descriptions of the "switching" phenomenon observed in patients with neurologic disorganization in applied kinesiology settings, the patients frequently confuse their left from their right, up from down, they reverse the instructions given to them, and so on. They will also frequently fail a number of the tests for proprioceptive function.

Another movement disorder, ataxia, involving the timing of movement may also be evident upon close examination of the patient. Patients with ataxia may walk with a wide-based gait and have trouble maintaining balance. In the cases we are speaking about here, this is not due to frank cerebellar or basal ganglia pathologies, but to distorted feedback to the cerebellum from joint and muscle proprioceptor dysfunctions.

To make the AK hypothesis clear, it is proposed that the abnormalities in postural mechanisms seen in learning disabled children are often reflected in poor "tonic" afferent flow from the muscle spindle and that the postural responses can be helped toward normalization by activating the tonic afferents using specific manipulative therapy.

In general, hypotonicity on MMT may indicate a paucity of sensory flow upon which normal execution of postural reflexes is dependent. Kinesthesia has been found to be positively related to muscle tone in learning disabled children. This relationship may be demonstrated with the proprioceptive tests described in this paper. Kinesthesia is another proprioceptive function that can be tested. With the vision occluded, the patient attempts to place his finger on a point at which his finger previously had been placed by the examiner.

Neurological disorganization theory was developed to explain an observed relationship between (a) deficits in interpreting sensory or postural information from the body and the environment, and (b) deficits in academic or neuromotor learning in some individuals who demonstrate learning disabilities or clumsiness or movement aberrations of various kinds. Learning here can be used in a very broad sense to include both academic learning, as well as behavior change and adaptive motor behaviors.

The theory hypothesizes that the correction of sensory and motor impairments will improve the ability of the CNS to process and organize sensory input and motor output, and, through this process, enhances conceptual and motor learning.

5. AK and the Proprioceptive Systems

Synapses that normally are made as a result of normal somatosensory, visual, and vestibular input are not being made in the patient with proprioceptive-somatic dysfunction. AK treatment improves the tissue tone within the sensory receptors throughout the body. Muscle tone is enhanced and the increased facilitatory effect on the intrafusal fiber to the muscle spindle prepares the nervous system for easier activation of the alpha motor neuron supply in the skeletal muscles in subsequent activity. Muscle tone contributes directly and indirectly to the development of the patient's body scheme, thereby improving their neurologic organization and development.

Muscle inhibition and facilitation in general reflects the amount of neural impulses reaching the small intrafusal motor neurons serving the muscle spindle, which then influence the degree and kind of discharge of the primary and secondary afferents from the muscle spindle cells, which in turn influences the discharge of the alpha motor neurons. The amount of spindle discharge helps determine the amount of proprioceptive input being received by the central nervous system, a matter of constant concern in proprioceptive testing and treatment. Low muscle tone suggests inadequate sensory flow to the intrafusal fiber. It has been hypothesized that proprioceptive flow from the musculature contributes to organization at the brain stem level and to visual and vestibular organization of proprioceptive perception. The extraocular muscles are skeletal muscles too, and are facilitated especially through the connections of the vestibular nuclei with cranial nerve nuclei III, IV, and VI over the medial longitudinal fasciculus.

Muscle strength and the biomechanical relations of joints will affect an individual's ability to respond in an appropriate, efficient, effective and timely manner to perturbations in posture.[16] Proprioceptive flow, determined by MMT and proprioceptive challenge of the body, helps set the hypothalamic balance which, in turn, acts on the autonomic nervous system and exerts a tonic excitatory influence on the cortex. Through this route, according to Gellhorn, increased proprioception can result in a more positive emotional state.[17]

Muscle tone also reflects certain conditions of the brain stem, especially how the brain stem is processing and directing its afferent input. In particular the function of the cranial nerves can be evaluated using applied kinesiology testing procedures. The cranial nerves, together with the cranial connective tissue, operate as a continuum and are powerfully linked to vital organs (eyes, ears, cerebrum, cerebellum, brainstem) and pain-sensitive structures (e.g., cranial nerves and dura mater), and injury or impaired physiology or motion to these structures can make cranial nerve tissue dysfunctional. The function of cranial nerves III, IV, and VI are evaluated using applied kinesiology's ocular lock, eyes-into-distortion, and oculo-basic testing procedures. The function of cranial nerve XI is evaluated by the well-known MMTs of the sternocleidomastoid and upper trapezius muscles. Numerous other cranial nerve tests are described in the AK and neurological literature.

Reflexes in the semicircular canals of the temporal bone and in the extraocular muscles of the eye affect muscles other than those of the eyes and head, especially those of the limbs and neck, and provide an indirect route for influencing global muscle function. Improved function of the upper trapezius, sternocleidomastoid, and extraocular muscles is a consistent outcome from proper cranial treatment using applied kinesiology procedures. Proper contraction of the upper trapezius and sternocleidomastoid muscles is necessary to hold the head up and stabilize it. Without the proper function of these and the other neck flexor and extensor muscles, lasting correction of cervico-cranial syndromes is unlikely. This muscle contraction elicits a proprioceptive flow that adds its influence to the direct influence of the improved ocular and vestibular functions achieved by cranial treatment to these areas. The entire sensorimotor response becomes self-supportive through proprioceptive facilitation.

To make the hypothesis even more clear, it is proposed that the abnormalities in postural mechanisms seen in a chiropractic practice are often related to poor afferent flow from the muscle spindle and other proprioceptors and that the postural and proprioceptive responses can be helped toward normalization by activating the afferent receptors. Synapses that are normally made as a result of adequate proprioceptive input from muscle spindles, golgi tendon organs, skin and joint mechanoreceptors, are not being made in a patient with proprioceptive dysfunction. With enhanced muscle tone, nerve and joint afferentation, the improved facilitatory effect on the intrafusal fiber to the muscle spindle prepares the nervous system for easier activation of the alpha motor neuron supply in the skeletal muscles in subsequent activities.

Soft tissue damage leading to sensory disturbances into the nervous system are commonly found on AK evaluation. Disuse of muscles and joints, scarring, and trauma to muscles, ligaments, and joints, contraction and stiffness in the connective tissues surrounding the muscles and the presence of edema and inflammation are all proposed as factors able to compromise sensory feedback into the nervous system by bombarding the afferent mechanisms with altered feedback.[18]

6. Proprioceptive Testing in Applied Kinesiology

Proprioceptive testing should be performed on any patient who complains of disturbed balance or if there is a suspicion that equilibrium disturbances exist in the patient. Because postural and proprioceptive functions are so automatic, they are often taken for granted even in the clinical setting. If the patient walks onto the examination table, the doctor then looks for pain and its cause. But the cause of the problem may be discovered only when testing the patient while proprioception is going on, or while the patient is moving. This tendency toward lack of awareness of the proprioceptive integrity in our patients is especially true if only a mild dysfunction exists that does not obviously interfere with gait and stability during locomotion. One of the more difficult tasks of the physician is to recognize not only the existence, but also the significance of slightly disordered postural mechanisms.

Since equilibrium reactions are subtle, sometimes even virtually unobservable when they involve little or no motion, eliciting them and observing their response requires special skill. It is particularly easy to overlook the importance of equilibrium reactions in the supine or prone position. Arguments for activating postural mechanisms in our patients in the prone, supine, sitting, standing, and moving positions have been given elsewhere in the AK literature (PRYT testing, E-I-D, ocular lock, oculo-basic, and gait testing, etc.).

The physician who evaluates proprioceptive function in his patient must have some understanding of the status of the sensory receptor system in the patient he is attempting to help and, most importantly, where any dysfunction may lie. Many aspects of proprioceptive dysfunction can be evaluated objectively using manual muscle testing and other assessment procedures developed in applied kinesiology.

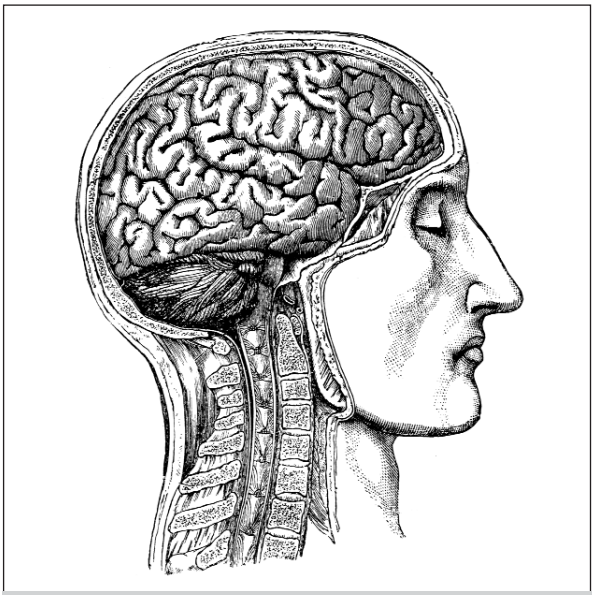
Symptoms in patients that suggest a need for proprioceptive evaluation and treatment:

a) Poor posture – stooping (especially when reading or writing)
b) True vertigo with a sense of directional imbalance triggered by movements of the head and neck.
c) Hypotonic muscles
d) Hypertonic muscles – stiff, jerky movements
e) Poor sense of balance
f) Dislike of heights, fear of falling
g) Constant fidgeting or moving
h) Motion sickness (gets car sick)
i) Problems with awareness, memory, or language
j) Inner ear problems
k) Oculomotor dysfunctions
l) Visual problems
m) Reading difficulties
n) Poor depth perception
o) Dislike of sporting activities, P.E. classes, running, etc.
p) Poor organizational skills

The most commonly employed methods for evaluation of the cerebellum and the vestibular system rely on the contribution of the body's proprioceptors for eliciting the equilibrium reactions that help maintain balance. Methods used to test the integrity of the vestibular, equilibrium, ocular, mechanoreceptor, and kinesthetic systems (all connected to the integrative function of the cerebellum), indicate the role that these systems are believed to assume in man's total body function.

The inseparability of proprioceptive and somatic functions has been discussed already. In addition to overt manifestations of proprioceptive imbalances, the AK method of proprioceptive testing is sensitive to the presence of abnormalities in somatic functions that are commonly undetected by the usual neurological evaluation. The existence of such factors as fine aberrations in mobility; impaired ability to converge the eyes at near point, with or without the presence of frank concomitant strabismus or nystagmus; mixed dominance; one-leg standing imbalance with visual righting reflexes removed; Hautant's test; tests of cerebellar function; gait testing; nutritional deficiencies (phosphatase) that affect proprioceptor receptor function…all of these tests identify the vulnerability of the individual to stress in environmental situations and postural challenges usually considered to be routine for most people.

Because of the importance of proprioception to the overall function of the human organism, direct clinical measurement of this factor in our patient's functional ensemble is very desirable. Before measurements can be meaningful, they must be directed to the right things and even in science, finding these things is the major achievement; the identification of something that has objective or physical reality and distinctness is even more important than quantitation.



More than 40% of the sensors relaying proprioceptive information to the brain are found in the cervical region. The suboccipital area is critically important to proprioception, and it is the area most frequently faulted in proprioceptive examination and treatment.[22]

Freeman Wyke Test

Goodheart introduced the Freeman-Wyke one-leg standing test into AK in 1989.[19] The test calls for organization of balance between flexor and extensor neuromuscular mechanisms, particularly the facilitatory and inhibitory factors mediated by the reticular system. Such organization involves the integration of 1) the alpha motor efferents from the larger anterior horn cells of the spinal cord which provide the prime stimulus to muscle contraction, 2) the finer gamma efferents which innervate the neuromuscular spindles of the muscle fibers and regulate muscle tone, 3) the muscle afferents which provide the proprioceptive sensory feedback which is essential for the regulation of motor functions.

The patient is asked to stand upon one foot in front of the doctor, to find their balance if they can, and then to close their eyes. If they lose their balance, the test is positive. Upon asking the patient to therapy localize to the cervical spine, they may immediately improve their balance. I have also found that therapy localization to the TMJ and/or the sacro-iliac joints may also improve their balance. Even the insalivation of a particular nutrient, when needed by the patient, may improve Freeman Wyke testing (cf. case history below). Subsequent specific challenges to these areas will find subluxations and other problems present. Therapy localization is difficult for detecting knee and foot or ankle dysfunction, and I have found that the physician can contact these areas very gently to observe for an improvement in postural balance.

Goodheart, citing the work of numerous physiologists, has pointed out repeatedly that there is a high density of proprioceptive fibers in the upper cervical spine. More than 40% of the sensors relaying proprioceptive information are found in the cervical region. The suboccipital area is critically important to proprioception, and it is the area most frequently faulted in proprioceptive examination and treatment. Grostic, Sweat, and other upper cervical chiropractic researchers have shown that joint dysfunctions of even less than 1 mm can disturb cerebellar function, muscle function, body posture, leg length inequalities, and nociception.[20, 21]

The Freeman Wyke one-leg standing test is a functional neurological evaluation that requires the integrated function of various proprioceptors all over the body, the integration of the right and left sides of the brain and spinal cord, and their related centers in the brain. These complex types of challenges are an important part of the differential diagnostic information that a physician using AK methods can employ to determine dysfunction in the sensory-motor-postural-proprioceptive systems.

Freeman Wyke one-leg standing test with eyes open.

[Proprioceptive problems should be suspected in the patient's ankle and leg if instability appears in these areas during testing. Hautant's test may be employed with this type of patient.]

Freeman Wyke one-leg standing test producing postural imbalance with eyes closed.

Freeman Wyke one-leg standing test with eyes closed, and simultaneous therapy localization to the cervical spine improves balance.

TL to the sacro-iliac joints will also improve postural balance if proprioceptive dysfunction originates there.

In the Freeman Wyke test, the perception of verticality acts on the postural mechanisms to help keep the body upright. The reflex is easily observed by comparing standing balance with eyes open and closed. This close interrelationship between the visual righting reflexes found in the Freeman Wyke test, and the effect of ocular muscle function on muscle testing outcomes throughout the body found in ocular lock testing, provides the basis for the assumption in AK that activating and normalizing ocular and somatosensory and postural mechanisms, especially in the supine, prone, sitting and standing positions, will provide a fundamental, natural, and optimum approach to improving neurologic organization, extraocular and body-wide muscle control, and proprioceptive facilitation.

This test can be used to demonstrate the importance of proprioception to our patients and it demonstrates how effective our treatments can be. This test is useful in effective treatment and patient management: we demonstrate to the patient after treatment that movement of the neck and postural function no longer provokes imbalance, dizziness, or vertigo. Older patients especially appreciate this demonstrable, very evident change in their balance before and after treatment. It is an excellent evaluation tool, and shows how much you can do to immediately change such a critical body function.

The standing deviations of the patient on one leg standing may also help assay the relative degree of neural integration of the two cerebral hemispheres, relating to which leg and to which side of the body the patient deviates. Dr. Carrick's method of blind spot mapping in order to determine the side of manipulation relates to this factor.[23]

Tests of standing balance should not be the sole criterion for evaluation of degree of integration of postural mechanisms. There is a fairly high natural variability in standing balance (especially among young children and older adults), and most patients have a large amount of practice balancing in the biped position.

Postural stability and adequate bilateral motor function required in the Freeman Wyke test depends upon two adequately coordinated extremities. If dysfunction in the foot, ankle, knee, acetabulum, or lumbo-sacral area exists in either extremity the two sides of the body cannot be expected to be well coordinated. The method used in AK to discover where this dysfunction exists is therapy localization and challenge.

Hautant's Test

In many patients who are dizzy, have vertigo, or are prone to postural embarrassment, the Freeman Wyke one-leg standing test is difficult to perform. Many patients have pronated feet, weak ankles, or other foot problems that make one-leg standing tests impossible to perform. Patients who are obese or who are simply too "proprioceptively disorganized" cannot perform this test well either. I have found another proprioceptive test to be simpler and as demonstrative to the doctor and the patient of their problem with proprioception.

Hautant's Test will usually confirm the findings of the Freeman Wyke one-leg standing test. Hautant's test has the patient seated during the testing, so that she feels safe even if dizzy. The patient is seated and the eyes are open, with both arms stretched out in front of them. The patient should point their fingers at the doctor's thumbs. The patient then closes her eyes in the neutral position while the doctor watches her hands and trunk for a few seconds to see whether the patient's hands deviate to one side in relation to his own fingers. After examination in the neutral position, the test is repeated in different head positions: rotated right, rotated left, extended back, flexed forward. While the patient changes position the doctor holds her hands in the neutral position to prevent deviation of the patient's fingers due to synkinesis of the arms (*synkinesis*: an unintentional movement accompanying an intentional movement). Drifting of the arms, deviation of the hands, vertigo, blurred vision are positive findings.

An advantage to the Hautant's test is that the patient feels safe even if they are dizzy because they are seated, and deviation is not caused by nervousness, foot or ankle dysfunctions, or the common postural faults seen in the feeble, the elderly, or the very young. This is often the case in Romberg's test or the Freeman Wyke one-leg standing test scenario.

Certain positions of the head will create deviation of the hands that are pointing at the doctor's thumbs, and certain positions will abolish the deviation. In this test any deviation that takes place when the patient turns her head is the result of the head position relative to the trunk. The cervical spine can be diagnosed as the primary suspect if the test is positive. In fact, I have found that this test gives useful information as to the subluxation present in the neck. Positions that cause or increase deviation, and those that abolish deviation can indicate (via body-language analysis) the subluxation positions to examine for during challenge testing of the cervical spine. Diagnosis is corroborated (or reversed) if the deviation disappears (or persists) after treatment.

If the Freeman Wyke test can be performed, I have found that correcting the factors causing it to be positive will also correct the factors creating positive testing in Hautant's test.

If the test remains positive after clearing the cervical spine of subluxations and soft tissue problems, then a disturbance to the labyrinth should be suspected, leading us into the cranial evaluation and treatment of the patient. As we know, it is not only by afferent stimuli from the joints and muscles that the cervical spine may cause disturbances of equilibrium; proprioceptive disturbances can also come from intracranial structures, including the labyrinth of the inner ear inside the petrous portion of the temporal bone; the vertebral artery may also be disturbed and must be evaluated in cases where treatment to the cervical spine do not correct the Freeman Wyke, Hautant's, and other cerebellar and proprioceptive tests.

Hautant's test unsteady in neutral position.

(Patient's hands drift to her left and inferiorly in each of these photographs.)

Hautant's test unsteady with head rotation.

(Doctor's thumbs – target of patient's fingers – not pictured.)

Hautant's unsteady with head extension (or flexion).

(More than 40% of the sensory receptors relaying proprioceptive information are found in the cervical region.)

DeKleyn's test for vertebral artery involvement. During rotation of the neck, the output of the vertebral artery on the side opposite the rotation is reduced. At maximal rotation, the carotid output is also diminished. Rotation combined with extension of the neck reduces output of the contralateral vertebral artery by approximately 30%. Normally, this creates automatic circulatory compensation in a patient who has no trauma or arthritis in the neck. It is much more difficult in a patient with cervical arthrosis, subluxation, and abnormal muscular/ligamentous/dural tension. Many studies have shown that the vertebral arteries play a primary role in vascularizing the cerebellum as well as the primary autonomic centers in the brainstem. Hypoperfusion through the vertebral arteries in turn reduces flow through its collaterals ultimately affecting blood supply to tissues throughout the brain.

The importance of differential diagnosis in cases of proprioceptive disturbance should be obvious after this complex discussion. All of the sensory organs that we treat in AK are a source of specialized proprioceptive inputs. But, many of the clinical assessments used by other methods of proprioceptive diagnosis do not enable the physician to differentiate between the proprioceptive, the visual, the vestibular, or the mechanoreceptor contributions to postural control and motor performance. The tests discussed here allow us to determine precisely where the proprioceptive dysfunction lies. This complex problem of proprioceptive differential diagnosis involves neurology, orthopedics, otorhinolaryngology and ophthalmology.

7. Applied kinesiology's proprioceptive treatment method: the motor system's contribution to the sensory system

Our objective in treating proprioceptive disorders is to increase the brain's capacity to integrate proprioceptive sensation from the body's receptors by developing the motor responses that aid this mechanism. This will allow the patient to gradually self-induce proprioceptive stimulation, thereby potentiating this portion of the sensory system on a daily basis.

Many of these proprioceptive receptors are embedded in the muscles and connective tissues surrounding the joints of the body, and it is thought within applied kinesiology that alteration in muscle or connective tissue tone (myofascial dysfunction) may interfere with these feedback mechanisms.

Treatment that leads to better processing of information at the sensory receptor, spinal cord, or higher level, should also reduce the neural consequences of proprioceptive dysfunction. Normalizing tissue tone, signaling, and circulation should help to normalize signals that are entering the nervous system, and so gradually allow the nervous system to shift back to normal.

Adequate muscle contraction, especially against resistance, provides one of the major means by which proprioceptive input to the central nervous system is enhanced, and the major source of resistance is the force of gravity acting upon a segment of the body. Improvement of muscle strength (a consistent outcome of applied kinesiology therapy) thereby improves the proprioceptive pathways into the nervous system. By normalizing the muscle spindle activity or Golgi tendon organ activity of muscles in the clinic, the physician can enable a more normal pattern of muscle response during implementation of an activity. The majority of the AK armamentarium is directed toward the therapeutic evaluation and treatment of this kind of dysfunction.

7a. Case Histories:

C.G. (1921) Initial examination May 29, 2001. After several days of neck pain and stiffness, dramatic dizziness occurred with all body motions. Going from a seated position to standing produced instant dizziness. Patient had a feeling of instability and fear of falling; neck motion caused dizziness; had blurred vision when getting out of a chair.

On examination there was a positive Freeman-Wyke test on the right foot only; Hautant's test was positive with right head rotation and cervical extension, with the hands deviating to the left and inferiorly. Romberg's test was positive; finger-to-nose test was right finger over left by one inch. Numerous muscles in the body were strengthened by an upper cervical fixation correction. SCM muscles weak bilaterally; strengthened with cranial fault corrections. After sacroiliac, spinal, and cranial corrections that strengthened all the hypotonic muscles in her body on MMT, the patient passed the Freeman Wyke test on her right foot and said she "feels more normal." Hautant's test still showed slight deviation to the left on right head rotation.

On follow up exam May 31, 2001, patient's balance was much better. Only a slight dizziness now with certain positions of the head. Finger-to-finger and finger-to-nose tests accurate. Wyke testing remained imbalanced with eyes closed on the right foot; Hautant's test normal. Cranial faults now negative; spinal and sacral corrections correct proprioceptive testing. Recurrence of imbalance problem with getting out of a chair in August, 2001. Treatment of Adrenal Stress Disorder corrects this. No return of proprioceptive or equilibrium problems in the past 2 ? years. Patient seen on a monthly basis.

L.C. (1951) Initial examination on May 14, 2001. For the previous week the patient had dizziness and black outs. Neck pain, headaches, low back tension; digestive problems, insomnia, nightmares; on medication for pain; plantar fascitis; low blood pressure; varicosities. On examination there was imbalance on the right foot during Freeman Wyke testing, and TL to the cervical spine improved balance. Hautant's test showed deviation to the right, which improved on head rotation to the right as well as flexion of the neck. Ocular lock positive. Upper cervical subluxation corrected. Extensive findings of hypotonic muscles on MMT. Freeman Wyke testing improved, but Hautant's still positive. Negative findings in the neck and cranium leads to treatment of neuromuscular spindle cells in the TMJ. This corrects Hautant's testing.

On follow up exam May 18, 2001 patient had only one dizzy spell, but no black outs. Treated frequently for two weeks for numerous pain and visceral disorders. No recurrence of dizziness and blackouts in the past 2-? years.

T.D. (1958) Initial examination on July 17, 2003. This 45-year-old New York City resident lived 3 blocks from the World Trade Center on September 11th, 2001. He has suffered physically and psychologically since that time; adverse environmental exposures; business and personal misfortunes. Positive Freeman Wyke and Hautant's tests. Correction of cranial and cervical, pelvic and spinal faults improved proprioceptive testing. Curiously in this case, with the insalivation of Drenamin™, there was immediate improvement on Freeman Wyke testing. On the initial test, there was unsteadiness of the right ankle during the testing that was obvious to the examiner. The posterior tibial muscle on the right foot was also weak; as expected, the proprioceptive testing and posterior tibial weakness were both corrected by adrenal nutritional support.

On follow up exam the patient believed an enormous load had been lifted from him. Proprioceptive testing was now negative, with marked improvement on MMT. The patient was seen 3 times before he moved back to New York City (now living in Brooklyn).

P.Q. (1994) Initial examination on December 13, 2002. This 9-year-old child had problems with movement, clumsiness, and reading. She was forced to read slowly and with her finger; she trips and falls constantly; bumps into things; avoids physical competition and running; is mixed dominant. Difficult birth process due to delayed cervical dilation by her mother. Has had 18 sinus infections in her life; antibiotics used throughout her life. She did not go through a crawling stage; went immediately from scuttling on the floor to walking. Freeman Wyke test positive on right foot; TL to cervical spine improved balance on her right foot but caused imbalance to commence when standing on her left foot. She wobbles on her feet as she stands; she sits during the consultation on her own foot; touches things around her constantly. Near pointing is slightly off with her left hand. Hautant's test had deviation with all movements of the neck. Ocular lock is positive in both upper quadrants.

Weakening of indicator muscles with reading. Numerous problems in feet, pelvis, spine, jaw, and cranium are corrected. Uvula deviation corrected by Universal cranial fault correction. After treatment Hautant's test and Freeman Wyke are corrected.

On follow up examination December 19, 2002, mother reports that her child seems to be moving better and more confidently. Her habit of reading with her finger along the line of text has disappeared. Ocular lock testing and Hautant's still positive, but improved. Patient treated 4 times before all proprioceptive tests remained negative. Has progressed during the past year from being a very average student to being one of the best in her class.

L.P. (1997) Initial examination on July 14, 2003. This 6 year old girl has cystic fibrosis; Trisomy X; a gastric-tube is still in place for feeding; she has an "oral aversion" due to her first 3 years of life on a Naso-gastric tube. Projectile vomiting and reflux problem until she was 4 yoa. Patient grinds teeth at night; clumsy; hyperactive; adrenal stress disorder; tires easily; ADHD distractibility; if she cannot see her teacher or mother, she cannot hear them when spoken to; tactile aversions; on antibiotics most of her life in order to control cystic fibrosis.

Finger-to-finger, finger-to-nose, near-pointing, Freeman Wyke, and Hautant's testing are all positive; mixed dominance; during ocular lock testing the child was unable to find my finger in certain fields of gaze. Large sutural faults are found, especially in the occipito-parietal, occipito-mastoid sutures. Foot, pelvic, upper cervical, TMJ, and cranial faults corrected. K-27 testing remained positive.

On follow up examination August 1, 2003 patient's mother notices that she is moving more confidently. The child is more graceful and confident in her running, and her arms and head no longer flop about wildly as she scampers about. School is beginning now and the child is reading better than expected. This child did not respond as fully to manipulative therapy as desired, and so cross-crawl patterning was given. This improved her physical and mental performance further. On second day of cross-crawl therapy, mother was able to begin reducing dosage of Ritalin™. This case is still in progress.

These are all complicated cases and are interesting for many reasons. The same physical faults that were creating these patients' pain and discomforts were also the faults creating their proprioceptive and equilibrium disorders. As long as some underlying disturbance – in the feet, the jaw, the viscera, the cranium, and especially the upper cervical area – remained uncorrected, with its consequent faulty proprioceptive and movement disorders, relapses would occur. Examination and treatment of the entire system has proven to be necessary in complicated cases.

The interrelationships between proprioceptive testing and treatment, postural problems, the chiropractic subluxation, hypotonicity on MMT, cranial faults and other related factors found on AK evaluation may seem complex and tangled, but they are all causative factors that must be recognized and managed in our problem patients.

It is not believed that new anatomical pathways are developed with the improvements in muscle function found after AK therapy, but that already existing neuronal connections, which are lying more or less dormant, are used with greater ease and frequency and consequently become more important in directing behavior. Eccles has expressed the situation clearly. "Frequency of synaptic use leads to an enduring enhancement of synaptic function and prolonged disuse has a deleterious effect on the potency of synapses."[24]

Neuronal connections change as a consequence of experience. For a neuron, experience consists of either receiving or emitting an impulse. Therapy consists of correcting the sensory input problems in the patient that are transmitting aberrant experience into their CNS; corrections specifically planned, using the applied kinesiology differential diagnostic methods, to control sensory input and elicit output will bring about more normal function, especially at the brain stem level.
The objective is to simultaneously increase the brain's capacity to integrate optic, vestibular, and somatosensory (proprioceptor and mechanoreceptor) stimuli by developing the motor responses that aid integration and to gradually increase self-induced muscular, ocular, and vestibular (proprioceptive) stimulation.

This method of evaluation cannot stand alone, and constitutes just a part of how applied kinesiologists evaluate body function, health and disease. It is only when the ideas presented throughout the applied kinesiology teachings have been put together that one can appreciate the overall nature of the applied kinesiology chiropractic perspective on health and disease. This point is made as applied kinesiologists feel that to resolve locomotor and biomechanical problems, many areas of the body must be explored in order to achieve long lasting symptom relief.

Afterword: A Note On Oliver Sacks

Just as this paper came to completion I began to read Oliver Sacks' book "A Leg To Stand On."[25] This afterword will serve as an encouragement to read Dr. Sacks' books, his neurological novels, his "pathographies" and "neurographies."

"A Leg To Stand On" is a personal, book-long case history about Dr. Sacks' loss of proprioception in his left leg after his left quadriceps muscle was severed just above the knee while climbing a fjord in Norway. The book is a wonderful journey into the world of neurology and proprioception, and tells us what it feels like for a patient (who is also an exceptionally lucid neurologist) to lose the proprioceptive sense. His answer to the question, "Do severe disturbances of body-image and body-ego occur as a result of peripheral nerve and muscle injury?" is a resounding "Yes." Every patient with proprioceptive loss participates, in some measure, with the "internal amputation," and "dissociation of gnostic systems" suffered by many patients with more severe neurologic disorders.

Dr. Sacks is creating or perfecting a new genre of writing, not so much a scientific genre, as a literary one. It is not simply the technical penetration of Sacks' observations that make his books successful both scientifically and as literature, but the human quality, the compassion of the author in recognizing the human plight of his patients.

These are not cold, clinical accounts, but compassionate interpretations of what it means for somebody to live with a nervous system that works differently than our own. These humane yet naked stories of neurological disorder and disease are related, for me, to the expansion of our selves and our capabilities through the medium of literature and poetry. For physicians like us, working with the ceaseless flux presented by our patients, this kind of literature helps us better comprehend the meaningful lessons we can learn from our patients' pain and despair.

In this new genre of neurological story telling that Dr. Sacks exemplifies, "pathology" becomes not a domain alien to the human condition, but part of the human condition itself. Rather than dismissing the ill and the injured as beyond the pale of human explication and understanding and brotherhood, we need to ask instead about their subjective landscape, their implicit and personal epistemology, their presuppositions…what makes THEM work? *What are their gifts and strengths?* Dr. Goodheart's famous question, "*Why is that?"* is an example of this kind of clinical questioning. They cease being "cases" in Sacks' hands and become human beings again. They become part of literature as well as science.

Sacks: "Scientific observation is not merely pure description of separate facts. Its main goal is to view an event from as many perspectives as possible." In the end, we must find the "inner laws" that produce the uniqueness of each event and patient in their own unique setting; we must finally (in words he borrows from Karl Marx) "ascend to the concrete."

"A Leg To Stand On" is an exemplary source of information about proprioception.

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The L5-S1 Fixation Revisited

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Abstract

OBJECTIVE: Description of the fifth lumbar-sacral (L5-S1) fixation analysis and treatment in applied kinesiology.
CLINICAL FEATURES: Goodheart described an L5-S1 fixation as relating to a unilateral teres major muscle inhibition.[1]
CONCLUSION: To bring attention to a fixation pattern not in general use among applied kinesiology practitioners.

Key indexing terms: applied kinesiology, spinal fixation, muscle inhibition, teres major muscle

Introduction

Spinal fixations are typically diagnosed via inhibition of the same muscle bilaterally, therapy localization of the affected spinal area with movement, palpation findings, and challenge. There are two exceptions to the rule of bilateral muscle inhibition. A unilateral neck extensor inhibition may indicate an iliac fixation and a unilateral teres major inhibition may indicate an L5-S1 fixation.[1, 2] It is the authors' impression that the L5-S1 fixation is not in wide usage in the applied kinesiology field as indicated by personal communication with practitioners as well as its absence in major applied kinesiology texts.[2, 3]

Discussion

The authors were trained in the unilateral teres major/L5-S1 fixation by attending basic applied kinesiology courses as taught by Daniel H. Duffy, Sr. in 1980.[4] He has continued to train his students in this fixation technique.[5]

Procedure for diagnosing and correcting an L5-S1 fixation is as follows:

1. Unilateral teres major inhibition that facilitates upon therapy localization of the L5-S1 region.
2. Palpation of L5 and S1 is performed as per other fixations. Apply pressure from right to left and left to right on the L5 spinous process and the first sacral tubercle. One direction will be fixated. The side in which the spinous process of L5 and the sacral tubercle of S1 will not move towards is the posterior side as described in fixations. There are two possibilities: A. Pressure applied from left to right on the left side of the L5 spinous process and first sacral tubercle that is fixated (won't go to the right) is a relatively right posterior L5-S1 fixation. B. Pressure applied from right to left on the right side of the L5 spinous process and first sacral tubercle that is fixated (won't go to the left) is a relatively left posterior L5-S1 fixation.
3. Correction: Release the centerpiece of the adjusting table, or use a pelvic drop, if available. Contact on the relative posterior side of L5 and the opposite side of the sacral base and adjust from posterior to anterior.[4]
4. Following correction, retest for facilitation of the teres major originally found inhibited.

Clinical indications for investigating an L5-S1 fixation with a unilateral teres major inhibition according to Goodheart are chronic, tonic, clonic, intermittent torticollis and chronic cervical or shoulder problems.[1] Duffy teaches that this fixation is particularly important in difficult shoulder cases.[4]

Conclusion

A useful technique in spinal fixations that appears to be underutilized in the applied kinesiology field is presented with clinical indications for its usage.

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The Fitness of Human Nature

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Abstract

Human nature is the epigenetic rules that bias cultural evolution in any one given direction. It is the summation of individual's most basic beliefs that determine our attitude towards each other. If our basic belief systems are reversed, that is; an individual weakens (utilizing manual muscle testing) to a positive life statement and strengthens to a destructive life statement, then across evolutionary time the composite choices of many individuals determine the fate of the planet, the human species, culture, and all other life as we know it towards eventual extinction.

Introduction

It is now recognized that biological expression is actively determined by the perception of its life experiences. Resulting learned experiences have been observed to pass to future generations as modified behavior. Thoughts are extremely powerful in determining behaviors as well as physiology. Thoughts act as filters through which we perceive ourselves and the world around us.

If our basic belief systems (thoughts) are in essence reversed, then our response to environmental stimuli will also be switched. Growth behaviors are associated with attraction whereas protective behaviors with repulsion. This analog response may be thought of as love (attraction) and hate (repulsion).

Umbilical reversal (UR) was first introduced by John Diamond, M.D. If the individual tested positive for UR then all his/her basic belief systems were switched. That is, love is reversed to hate, good for bad, etc. This is very profound since a mother's perceptions directly impact the selection of gene programs, which have been established to effect subsequent generations altering the phenotype. The future for human civilization may be viewed as the archaeology of these fractal patterns.

Discussion

The umbilicus test (John Diamond, M.D.) is performed by testing a subject's strong indicator muscle, placing his/her right fingers into his/her umbilicus, which should test negative. The doctor's left hand's fingers when placed into the subject's umbilicus should also test negative. The subject's right palm is placed on the doctor's left palm which should also test negative. A positive umbilicus test is with the test subject's right palm on the doctor's left palm up with his/her fingers inserted into the umbilicus of the test individual and a strong indicator muscle weakens.

A test subject displaying a positive umbilicus test will weaken to positive (constructive) life statements such as God is good (if they believe in God), I am good, love is good, clean air is good, pure water is good, etc. These same individuals will strengthen to a negative (destructive) life statement such as God is bad, (if they believe in God), I am bad, hate is good, polluted air is good, pure water is bad, etc. It's as if their most basic belief systems necessary for growth and survival are reversed. Originally Dr. Diamond recommended R.N.A., choline, inositol, and a brain tissue extract as a nutritional approach to this positive umbilicus test.

This is very profound since culture is created by the communal mind. The mind grows by absorbing parts of the culture from birth to death with selections guided by the epigenetic rules. These rules then display in the species via prepared learning, meaning they are predisposed to learn certain behaviors while prepared to avoid others. This bias forms a subclass of the epigenetic rules.

Memory may be divided into episodic and semantic. Episodic memory recalls the direct perception of concrete entities whereas semantic memory recalls meaning by connecting concrete objects to ideas and symbols denoting the objects. This may be defined as a concept. The adaptiveness of human behavior arises from these concepts that we call reference points. Altered reference points change the direction of culture.

So what happens if our most basic reference points are reversed? In what direction will the ship of humanity fail? Primary epigenetic rules are automatic processes that extend from the filtering of stimuli to perception of same. Secondary epigenetic rule are the integration of this information. Culture arises from human action, and human action arises from culture. Construction of the environment is what culture does by the summation of individual behavior. Moral concepts are defined from innate feeling. Insanity is the inability to choose among false alternatives.

A positive umbilicus test which denotes what I will label Umbilical Reversal involves the basic concepts of money (material), love (immaterial), prejudice (bias), and addiction (obsession).

The original tokens of money were copper, silver, and gold. These metals are related to brain function as midline, right brain, and left brain respectively. This also relates to Goodheart's idea of vivaxis (all muscles weakening when the test subject faces a particular direction – often times towards the birthplace).

Love is an attractor field whereas hate is repulsive. Attraction leads to growth and repulsion to protection. These two polarities which are relevant to all living system's survival is based upon its perception of the environment. Signals of love (nurture) encourage growth, threat signals (hate) encourage a Darwinian response of combative behavior (survival of the fittest) and stunts growth. Generations will respond in the same way as they are born in via their developmental programming.

Prejudice is a preconceived notion leading usually to intolerance and revulsion. This revulsion causes excitement. Excitement often provokes feelings of impending harm. Fear is the result which may lead to protective behavior and extends to its offspring extremely biased learning.

Addictions are the persistence of harmful learned habits in spite of damage to the subject. This implies some sort of memory that enables recognition of stimulus to be classified as safe or unsafe. This is dependent on resonance of the subject with his/her past patterns of behavior as well as those whom they imitate (the hundredth monkey effect).

Brains that choose wisely display superior fitness and a high biological imperative. This fundamental drive for survival will depend on the function of dynamical systems that are adaptive to environmental stimuli and capable of choosing wisely to accommodate to change in one's own arena of life. Attraction towards clean air, water, food, and healthy lifestyle with repulsion from life threatening behavior is fundamental to healthy growth.

However, if our most basic points of reference are reversed involving money, love, prejudice, and addictions; the ability to choose wisely is not possible. This analog response is what occurs when an individual has umbilical reversal. Umbilical reversal involves all emotional beliefs and includes the two ways humans learn: reason and revelation. Three muscles will always test weak in these individuals; pectoralis major clavicular, supraspinatus, and the abdominals tested as a group. These muscles will respond structurally to sacral wobble, nutritionally to sesame seed oil perles, and homeopathically to Momordica, in a homaccord form. This com-

bined structural, nutritional, and homeopathic approach appears to help prevent the recurrence of umbilical reversal, but will not cure it.

Four homeopathic medicines in a potency of 1M each, not to be administered at the same time, but usually waiting a six month period between doses seems to treat deeply enough to effect a cure. These four remedies are (not in order necessarily of prescription) Anthemis Nobilis, Spiraea Ulmaria, X-Ray, and Zincum Muriaticum.

Anthemis Nobilis is the common chamomile. It is clinically useful with colic, dyspepsia, liver congestion, ascarides, and headache. Spiraea Ulmaria is meadow sweet. Clinically we find a morbid disposition, convulsion, epilepsy, afflictions of eyes, hydrophobia, urinary deposits, fearful quams of conscience and loathing of him/herself. X-Ray has been used successfully for skin lesions, distressing pain, sexual dysfunction, anemia, leukemia and burns which refuse to heal. Zincum Muriaticum which is zinc chloride, has clinically useful properties in kidney dysfunction, constipation, convulsions, cramps, hiccough, hydrocephalus, smell and taste perversion, wounds, and excessive nervousness, anxiety, and depression. For a more detailed clinical picture of these four remedies, please refer to Boericke, Herring, and/or Clarke's Materia Media. A single dose is all that is required. Wait approximately six months before testing the other three remedies, proceed with what tests in succession.

Many times a patient is highly suspect to have umbilical reversal and yet upon testing this is not found. Additional research revealed that if the subject therapy localized (TL) the governing vessel/conception vessel pulse point, with flexion (females) or extension (males) then a positive TL would occur. This could be negated by the wearing of violet colored glasses indicating the involvement of the negative feelings of guilt and/or shame. After positive TL to the fourth pulse point in flexion or extension, then a positive umbilicus test would display in the clear. The feelings of guilt and/or shame appears to cause a covert umbilical reversal which is brought to the surface with this additional procedure.

Will power will also be restored to these umbilically reversed patients. This is easily tested with statements such as I'm okay without tobacco, alcohol, sugar, drugs, etc. Indicating an attraction towards life enhancing (positive) habits and a repulsion away from life compromising (negative) behavior. Interestingly, these same products will now weaken a strong indicator muscle as opposed to strengthening a weak muscle.

Conclusion

The fitness of human nature which in essence is instinct that is evoked by environmental cues and is controlled by prepared learning creates human action which directs culture either into growth (love) or repulsion (hate) is dependent upon reference points (basic beliefs). If these basic beliefs are reversed, then bias free learning and hence appropriate life enhancing responses are not possible. Emotion driven epigenetic rules involving all categories of behavior under the combined influence of heredity and environment operate innately from the summation of individual intention which if umbilically reversed works against the best interests of society.

A story is often told of a little girl who was vying for her father's attention. The father was engrossed in a championship football game that was on the television. The little girl asked her father if he would play question and answer where she would ask him questions and he would answer them. Questions like …why is there world hunger? Why is there pollution? Why do people hate each other? Why do people take drugs? Why is there war and fighting in the world and so on? The father just wanted to watch the football game. In hopes that his daughter would let him do that, he took a picture of the planet earth cut out of a magazine, tore it into about forty pieces and told his daughter that this was a puzzle of the world and when she was done

assembling it he would answer her questions. He figured it would take her at least two hours if it was possible at all to assemble the picture of the earth. Five minutes later the little girl returned to her father with the puzzle completely assembled with every piece perfectly placed. Stunned at what she had done, he turned to her and asked, how could you have possibly done this in only five minutes? She went on to tell her father that on the other side of the picture of the earth was a picture of a man. I figured that if I could fix up the man and put him back together, then the world would take care of itself.

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Reactive Tendon

G. Kingman Fung, D.C.

Abstract

This paper contributes to the existing body of soft tissue therapies accumulated in applied kinesiology. It can be utilized in many sport situations when fast twitch movements are starting to break down due to deaffrentation of descending pathways.

Introduction

Applied kinesiology has introduced some original therapies and adapted others in an effort to have a wide range of treatments for soft tissue injuries. Tendon overload helps to complete the best collection of therapeutic soft tissue available and can contribute in preventative as well as in the treatment of sports injuries and repetitive stress injuries.

Method and Summary of Procedures

Adjust and clear the body of weak or inhibited muscles. In a sport related or work load related joint have the person mimic a movement at full speed. Test a posterior muscle above the waist or flexor muscle below the waist related to the movement. A weak or inhibited muscle is a positive for the technique. Usually the muscle will inhibit for one muscle test and then restrengthen. Test that muscle in the clear with a patient Therapy Localization on the tendon of an antagonist in that area. The weakening of the original muscle tested confirms the tendon overload situation. The antagonistic muscle is hypertonic in relation to the original muscle tested. On the muscle that the patient Therapy Localized, the antagonistic muscle, turn the golgi tendon/organ down by pushing both ends towards their origins and insertions four to five times. On the original muscle turn up the golgi tendon organ by pushing the GTO towards the muscle belly 4 to 5 times.
Have the patient re-enact the full speed movement and retest the original muscle. It should now hold strong. Some golgi tendon organs are not as palpitable as others. The doctors contacts will be at the sites of the T.L.

Discussion

With the many stresses that the human body can incur it can result in decreased frequencies of firing of cortex and the expression can be the loss of inhibition of inhibition of anterior muscles above T6 and the posterior muscles below T6. This deaffrentation of cortital and reticulo spinal pathways causes obvious muscle imbalances that express it self as rolled in shoulders, tight hamstrings and calves. These muscle imbalances can produce the type of tendon overload that this technique demonstrates. Example of posterior or extensor muscles above T6 are the posterior shoulder muscles, triceps, the forearm and wrist extensors. Flexor muscles below T6 would be the iliopsoas and hamstrings. This technique may be considered advanced in terms that the practitioner familiar with the kinetic chain firing of certain motor movements i.e.; throwing, kicking and running as examples have a great advantage on finding breakdown that occurs as opposed to the tedious method of testing every muscle related to a joint in motion.

Conclusion

Reactive tendon technique provides another valuable tool in sports specific injury situations as well as in preventative situations. It once again puts the applied kinesiologist at the head of the class as the preeminent sports medicine doctor.

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Fractionated Muscle Testing: The Missing Component of Muscle Testing

G. Kingman Fung, D.C.

Abstract

I believe fractionated muscle testing gives applied kinesiology a standard where all can benefit and uniformly covers all the different levels of practitioner's strength, endurance and artistic expression.

Introduction

Whereas a full contraction of a muscle being tested may be sound, it can be exhausting, impractical and not nearly as user friendly as the equally sound method of fractionated muscle testing.

Method and Summary of Procedures

The practitioner simply commands the patient to contract at a level that the tester feels comfortable and is able to match and then exceed by 5 to 7 percent.

The doctor or practitioner chooses a muscle and states to the patient, "In this position I will simply ask you to push in this direction; I will match your contraction and test if the muscle neurologically responds by locking." If it does, it is strong or facilitated, if it does not, it is weak or inhibited. In that first contraction, the practitioner gauges his comfort level to that contraction and if need be, changes the test by asking the patient to push lighter, or harder, or at maximum contraction. The result will be the same, but at a level that with which both the patient and doctor can feel comfortable.

With fractionated muscle testing, when the muscle is weak, simply double check the inhibited muscle by asking the patient to maximally contract. It should still go weak, and you have confirmed your test.

Discussion

There are three major components to muscle testing: position, timing and intensity. I believe position is very well documented and very sound. Timing is an area where novice muscle testers usually hold the test way too long. The proposed standard is one and a half second. I've observed that the best muscle testers get their results in about one second. I believe that the half second variant is acceptable.

In the intensity part of muscle testing, controversy reigns with constant comments of, "everybody tests differently." The fact remains, everybody is different, and I believe a system that can accommodate for everyone's different strength, size, and endurance level is a total win/win situation.

Fractionated muscle testing gives the practitioner levels of control, reliability and ease for both doctor and patient. Full maximum contractions can be also exhausting for the patient as well. Maximum contraction testing for demonstration purposes is great, but to do it all day for some people does not make sense when you can get the same results in a much more user friendly capacity. It has been demonstrated many times that a tester of limited strength, can still test a weak muscle with the same results as a strong tester. Conversely, on a very strong patient, the tester would be overpowered and not able to match a maximum contraction of muscles such as the rectus femoris, pectoralis major-sternal division and the muscles of the foot, such as tibialis anterior and peroneus tertuis.

The test conducted in a fractionated manner is also neurologically, "threshold" sound. That is to say that the threshold is still the sum of the input at the anterior horn, the final common motor pathway. In other words, whether the practicitioner asks the patient to push with light, medium or maxinum contraction strenght, as the practitioner matches that push and increases it by 5 to 7 percent, an inhibited muscle will be inhibited at all levels.

Conclusion

I totally believe in setting a standard to the "muscle testing" world where we can finally truly distinguish ourselves, if need be, from anybody else that does not meet that standard. However, it does not make sense to have a standard that is not able to be met and which few adhere to presently and can not account for all the variations that already exist.

I propose to include this concept of Fractionated Muscle Testing, under the intensity definition, as part of the standard for applied kinesiology muscle testing. It would allow the artistic expression of the practitioner to make a choice between light to maximum patient contractions which most practitioners are already doing.

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Iodine and Tyrosine: The Most Misused Nutritional Support for the Thyroid

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Abstract

This paper will discuss the negative impacts tyrosine and iodine may have on thyroid metabolism. Physiological mechanisms will be provided with references made to the all-muscle-strong phenomenon observed (not universally but by this author) in applied kinesiology.

Discussion

Tyrosine and Thyroid Hormones?

Caution should be used in supporting the thyroid nutritionally with products that contain tyrosine. Although these compounds are important for thyroid metabolism, their use in many cases will actually suppress thyroid function. Examining thyroid function in a textbook is not always relevant in clinical practice. This is especially true when you look at the published studies on tyrosine. No study using tyrosine has shown the ability to increase thyroid hormones, even when they are low. The use of tyrosine and thyroid hormone metabolism is much more complicated than tyrosine supplementation. On the other hand, there are several published studies that show tyrosine supplementation has the ability to immediately increase catecholamines such as epinephrine and norepinephrine. Catecholamines have a suppressing impact on thyroid peroxidase which is the rate-limiting enzyme in thyroxine supplementation. Therefore, using tyrosine as a supplement may have very little influence on increasing thyroid hormone synthesis but it has an immediate impact on increasing catecholamines that suppress thyroid hormone production.[1,2] Caution should be used in supplements that contain tyrosine when supporting the thyroid nutritionally, especially if the patient has indications that they are in a stress response. When Tyrosine is used for oral applied kinesiology testing, it, in most cases, creates an all-muscle-strong pattern suggestive of sympathetic dominance. Muscle testing facilitations when testing Tyrosine may therefore be misleading if the clinician does not screen for all-muscles-strong pattern.

Iodine and Thyroid Hormones?

Caution should be used when using supplements that contain iodine. Iodine intake as it relates to thyroid hormone is a double-edged sword. Iodine is needed for T4 production. On the other hand, excess iodine intake is suppressive on thyroid hormone synthesis. Once again if you look at a textbook concerning thyroid hormone metabolism iodine seems a logical compound to use in patients with low thyroid hormone metabolism. However, in the United States we have iodized salt. Iodine is added to our source of salt, which means anytime a person eats salt they are getting exposure to iodine. The average intake of sodium in the United States is astounding, especially with the patients we see in our offices that eat an unbalanced diet. Adding extra iodine to the diet of individuals that are already overexposed to iodine, from high sodium diets, may have a suppressing impact on thyroxine synthesis. Normal subjects given 1 to 2 mg iodide per day (in addition to their usual diet) have a transient decrease in T4 and T3 secretion and transient increase in TSH

secretion.[3] In regions of iodine deficiency, iodine supplementation precipitates Grave's hyperthyroidism and other types of hyperthyroidism, by means of the Jod-Basedow phenomenon.[4] Iodide and drugs that contain pharmacologic amounts of iodide may cause hyperthyroidism in euthyroid patients with thyroid autonomy – that is multinodular goiter or hyperfunctioning thyroid who live in areas of severe iodine deficiency.[5] When using applied kinesiology testing with iodine it is important for the clinician to test for conditional inhibitions of facilitated muscles as well as for all-muscle-strong pattern.

Conclusion

In conclusion iodine and tyrosine should be used with caution, especially with patients that are under a stress response and/or exposed to excess amounts of sodium in their diet. If applied kinesiology muscle testing is used in testing these nutrients, screening for an all-muscle-strong pattern should be conducted to avoid iatrogenic problems.

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Nutritional Support for the Thyroid: A Brief Review

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Abstract

This paper will review less well known nutritional and herbal compounds that have, shown to support thyroid metabolism. References will be made to Withania somnifera, vitamin A, vitamin D, selenium, zinc, and guggulsterones.

Discussion

Withania somnifera contains compounds that have been shown to have a stimulatory impact on both T3 and T4 hormone synthesis. It also has been shown to reduce hepatic lipid peroxidation and increase the activity of superoxide dismutase and other antioxidant systems.[1 2] This is important because numerous studies have demonstrated that peroxidation and oxidative stress significantly alters thyroid metabolism.[3 4 5 6 7 8] Whithania somnifera also exerts adaptagen-like glucocorticoid activity, which makes it helpful in thyroid imbalances that are negatively influenced by the stress hormone cortisol.[9 10] Cortisol has the potiential to lower TSH, suppress peripheral T3 conversion, increase inactive reverse T3 production, and antagonize the effects of thyroid signaling at the genome.[11] Since Withania somnifera has demonstrated abilities to increase T3 and T4 hormone levels, decrease peroxidation, and act as an adaptagen to modulate the release of cortisol it should always be considered a powerful agent to use when supporting the thyroid.

Once thyroid hormones bind to receptor sites, a series of biochemical reactions called intercellular transduction are initiated. This intercellular transduction response carries the message of binding to the nuclear receptors. Once the nuclear receptor has been activated, it will respond by producing proteins that express enhanced metabolic rate and energy production. Vitamin A appears to influence thyroid hormone nuclear receptors. Thyroid hormone nuclear transcription activation involves vitamin A dependent retinoic acid-specific receptors.[12]

Elevated autoimmune thyroid antibodies are a very common pattern associated with the etiology of thyroid disorders. Vitamin D has shown to be an effective immune modulator as well as an effective suppressor of autoimmune disorders.[13]

Selenium is the major cofactor for the enzyme 5'deiodinase which is responsible for converting T4 into T3 as well as degrading rT3. Studies have confirmed lower production of T3 in individuals with lower selenium status.[14 15 16] Numerous studies have demonstrated increased T3 synthesis as well as decreased reverse T3 production with selenium.[17 18 19 20 21]

It has been shown that low zinc status compromises T3 production.[22] Studies have also demonstrated that zinc supplementation improves thyroid hormone production.[23 24 25 26] These effects may be due to the cofactor role zinc plays with type I 5'deiodinase. In addition zinc may play a role in reducing thyroidal antibodies.[27]

The guggulsterones compounds in Commiphora have shown to stimulate the synthesis of T3 hormones.[28] They also appear to have the ability to reduce LDL cholesterol and decrease lipid peroxidation.[29]

Commiphora's ability to increase T3 production, its ability to reduce cholesterol, and its antiperoxidative effects make it a very useful herb to consider with low T3 patterns.

Lipid peroxidation and antioxidant enzyme systems have been shown to play a profound role on its impact on peripheral thyroid hormone conversion. Numerous studies have demonstrated that peroxidation and oxidative stress significantly alters thyroid metabolism.[30 31 32 33 34 35] compounds that help quench perioxidation directly and indirectly via glutathione synthesis can be helpful in optimizing thyroid hormone metabolism.[36 37]

Conclusion

Many compounds have been important in supporting thyroid metabolism. It appears compounds that quench lipid perioxidation, have adaptagen-like impacts, posses immune supporting properties, and enhance intercellular transduction should be considered in man aging the thyroid nutritionally.

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Muscle Testing as an Aid In Rehabilitation

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Abstract

Specific forms of muscle testing are an aid in setting proper goals in a rehabilitation program. A description of these procedures is covered with specific examples of using them in setting individual goals.

Discussion

Muscle testing can be used for a number of purposes. Goodheart defined a specific type of testing in 1980[1] for testing either the aerobic or anaerobic response of a muscle. In doing this variation of testing, the rate of the muscle test is altered for repetitive tests.

Aerobic testing involves repeated testing of a muscle at approximately contraction every 1.5 – 2 seconds. Testing at approximately 1 test every .5 – 1 second, tests anaerobic, fast twitch response.

Originally, Goodheart described using different reflex techniques to increase the number of repetitions and certain specific nutritional approaches to increase the number of repetitions before the involved muscle would fail on the repeated tests.

These same procedures should be employed on a muscle that tests weak to repeated testing to ensure that the maximum number of repetitions that the muscle can perform has been found before the muscle fails.

Both the upper and lower extremity muscles of the shoulder should be tested for both aerobic and anaerobic weakness patterns. If both upper and lower muscles are found to fail to respond to a test at approximately the same number of contractions, then nutritional support for the muscle should be explored. Aerobic fibers are dependent on fat utilization and the level of myoglobin in the muscle fibers. Iron and related nutrients related to oxygen usage and myoglobin production need to be tested for. In the case of anaerobic fibers, glycogen converted in the Krebs's cycle. The nutrients required for this conversion need to be tested for.

After maximizing the response to repeated muscle testing, exercise – rehabilitation programs can be set that are individualized for the patient. For example, if the quadriceps weaken on the fifth repetition, then exercise repetitions should be no greater than 4.

For example, if you are seeing a person recovering from a leg injury that is a skier. Test the muscles and find the number of repetitions that the person can do before the muscle fails. Advise the person to exercise at that level and if they go skiing to stop and rest after making those numbers of turns.

In exercise, approximately a five second rest period between sets is usually sufficient for the muscle to be able to respond to another set of exercises.

Using muscle testing, you can determine which muscle fiber type needs to be rehabilitated. You can also find the maximum number of repetitions that can be done before micro-trauma to the muscles occurs.

Conclusion

This procedure has been used for over 10 years on professional athletes with no adverse effects and a positive response in accelerating the rehabilitation program. This answers the question of why some people respond to programs that are set on a set number of repetitions and others do not.

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Low-Tech Indicators of Decreased Blood Oxygen Levels

David Leaf, D.C., DIBAK

Abstract

A low-tech method of determining possible low blood oxygen levels will be described.

Discussion

Measurement of blood oxygen levels has become increasingly prevalent in the chiropractic profession over the past five to eight years. This is as a direct result of its neurological implications.

The author has used a Pulse ox meter for the last three years in his office. It has proved useful in helping to determine why some people respond quickly to therapy and others do not.

In 2003, Dr. George Goodheart demonstrated the use of testing the muscles of the fingers in relationship to a decrease functioning of the respiratory system.[1] His test consisted of having the patient attempt to hold a dollar bill between their fingers while he attempted to pull bill from between their fingers.

Following his demonstration, the author began to measure the relative strength of these muscles using a pinch meter. The patients who failed to hold the dollar bill were found to be able to pinch with less than 5 lbs. of force. These values were then correlated with the blood oxygen level as measured by the Pulse ox machine. Consistently, the values obtained would be below 96 in patients who failed the simple test.

The following chart represents the findings of 20 patients tested in this manner. Patients chosen for this experiment were those who said that they suffered from symptoms, which were made worse by activity. The symptoms included fatigue, muscle weakness and loss of strength. A control group of 10 patients who did not have the symptoms were put through the same procedure.

The patients were originally tested for their ability to hold the dollar bill between their fingers against resistance, the value of the pinch meter test and finally their pulse oxygen level.

The dollar bill resistance was recorded on a pass of fail basis, the meter reading of the pinch gauge held between the second and third fingers was measured and the Pulse Ox reading of the middle finger was recorded.

Patients who had blood oxygen normal values, strong finger muscles and corresponding pinch values above 4 lbs. were then asked to exercise in place. They were to march raising their knees up to a horizontal for 90 seconds. The above tests with then repeated.

Symptom group

	Before		After Exercise		
	Bill test	**Pinch Oxygen**	**Bill test**	**Pinch**	**Oxygen**
1	P	9	97	f	4	94
2	p	8	98	f	3	94
3	p	8	98	f	5	95
4	p	8	96	f	3	94
5	p	8	98	p	6	97
6	p	7	96	f	3	93
7	p	6	96	f	3	94
8	p	5	97	f	3	94
9	p	6	97	f	3	93
10	p	7	97	f	4	94
11	p	8	98	f	4	95
12	p	9	98	p	7	97
13	p	6	97	f	3	94
14	p	7	97	f	4	95
15	p	8	97	f	3	93
16	p	6	96	f	2	92
17	p	6	97	f	3	93
18	p	7	98	f	3	94
19	p	6	97	f	3	93
20	p	7	97	f	4	95

Control group – no symptoms

	Before		After Exercise		
	Bill test	Pinch Oxygen	Bill test	Pinch	Oxygen
1	p	7	98	p	6	98
2	p	8	98	p	8	98
3	p	9	99	p	9	98
4	p	10	99	p	10	99
5	p	6	98	p	7	98
6	p	7	97	p	7	97
7	p	8	98	p	7	98
8	p	6	98	p	7	98
9	p	8	99	p	6	98
10	p	7	97	p	6	97

For the patient's that had the above indicators, decrease in strength and lowered blood oxygen levels, the patient was put through a treatment protocol aimed at increasing respiratory function. This treatment consisted of normalization of rib function corrections to impairment of diaphragmatic function, cervical Imbalances affecting the phrenic nerve and normalization of oral and nasal breathing patterns. Following these corrections, the above tests were repeated.

Symptom group post treatment for respiratory function

	Before			After Exercise		
	Bill test	Pinch Oxygen		Bill test	Pinch Oxygen	
1	P	9	99	p	8	97
2	p	8	98	p	8	97
3	p	10	98	p	7	98
4	p	8	97	p	6	97
5	stayed strong on first test					
6	p	7	98	p	6	96
7	p	6	97	p	6	97
8	p	5	98	p	5	97
9	p	6	98	p	6	97
10	p	7	98	p	5	98
11	p	8	98	p	6	97
12	stayed strong on first test					
13	p	6	98	p	5	96
14	p	7	99	p	6	98
15	p	8	98	p	8	97
16	p	6	97	f	3	94
17	p	6	98	p	6	97
18	p	7	99	p	6	97
19	p	6	98	p	5	97
20	p	7	98	p	6	97

Results

In the control group, following exercise, the average drop in the pulse oxygen level was 1%. This drop did not adversely affect the strength of the fingers in the simple bill pulling test or the pinch meter test.

In the symptom group, 18 of 20 patients had their blood oxygen levels drop by an average of over 3% and weakening of their finger muscles as evidenced by a drop in the pinch test to 4 lbs. or less and an inability to hold the dollar bill against resistance.

Treatment directed at increasing respiratory function was shown to improve performance of the finger muscles as evidenced by an increase in the pinch meter measurements, which correlated, with a stabilization of the blood oxygen levels in all but one case.

Conclusions

In patient's who have weakness or fatigue on activity, a simple screening test for imbalances in their respiratory function affecting their blood oxygen level can be the simple dollar bill resistance test.

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Case Study: Severe Adrenal Stress Syndrome as a Cause of Anxiety in a 17-Year-old Caucasian Female

Tyran Mincey, D.C.

Abstract

A 17-year-old female presented to my office with a past medical history of anxiety. In addition to the anxiety she has a past history of a light persistent diaphoresis, and amennorhea. She underwent approximately one year of medical treatment on the drug Paxil.

Introduction

As an applied kinesiology (AK) practitioner, I have recently come to a new level of understanding of the crucial role that the adrenal glands play in the functional illness scenarios, such as the Adrenal Stress Syndrome, as addressed in many areas in AK literature. Recent promotion by pharmaceutical companies for the use of psychotropic drugs that impact adrenal function prompted me to write this case study, as the epidemic problems known as anxiety and depression have myriad causes, none of which is a lack of psychotropic drugs in the diet. This case clearly shows the gargantuan impact that functional illness can have on the life of an individual and the power and potential that AK can have in the restoration of health.

Diagnosis: Anxiety secondary to severe hereditary Adrenal Stress Syndrome with associated chronic subluxation complex and toxicity.

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Chief complaint: Nausea, fatigue (of seven years), aches (4 to 5 years) and, weight gain (2 years). Patient indicates that the nausea and fatigue have persisted since the 6th grade.

History: This 17 year female reports a history of extreme anxiety, slight diaphoresis, particularly in the hands, that she describes as "clammy", and crepitus in the hips. This was addressed by her Pediatrician by prescribing Paxil for 15 months. Her family history is positive for maternal and paternal alcoholism and depression.

Examination

Examination revealed vitals within normal limits, a low breath holding time, orthostatic hypotension, and body fat measurement within good limits for her age. Other testing revealed positive zinc taste test, adrenal stretch reflex, and positive homocysteine challenge. She also demonstrated neurologic disorganization. The patient's history also revealed signs of yeast overgrowth. Salivary Ph was a 6.0. Nails were flaccid and beds pale, poor circulation was noted in the hands and feet. Multiple muscles related to liver and heart were inhibited and responded to targeted nutrition. Gustatory challenge with homeopathic heavy metals lead to suspicion of barium, arsenic, and radium sensitivity or toxicity. Postural evaluation showed possible inhibition of gastrocnemius and Pectoralis major sternal and as well as subscapularis.

Lab Testing

A CBC with a differential revealed elevated total cholesterol. All other markers on lab for thyroid, and blood glucose were unremarkable.

Adrenal Stress Index (ASI), a salivary test that measures free cortisol revealed a circadian profile that demonstrated elevated A.M. cortisol levels and borderline midnight levels.

Treatment

1. Immediate modification of diet to correct the aberatted carbohydrate to protein ratio (her diet diary revealed 75% of her calories were from carbohydrates). We increased raw vegetables and protein and decreased carbohydrates from grain sources.
2. We used injury recall (Schmitt) as a method of correcting her neurologic disorganization. She immediately began to laugh following this low force correction. From that point on she began to heal nicely.
3. Manipulation based on findings on the TS line was performed on each visit. This included treatment of the factors influencing the adrenals, heart, and ovaries.
4. The Addition of EFA's to the diet to bring up the salivary Ph. Total Flaxseed Oil (Nutri-West) was suggested.
5. Increase in the number of meals consumed each day was suggested.
6. Adrenal support was suggested DSF (Nutri-West) tablet daily, which was increased to 2 and then decreased at the end of care to once per month.
7. Detoxification orally using Hi Pro (Nutri-West) (1 Tbl. b.i.d , Total Systemic Detox (3 capsules daily), and Total Probiotics (2 on empty stomach).
8. EB305 (foot bath) an ionic body-balancing device. 10 visits.
9. Parzyme A (Nutri-West) for parasitic support (2 at bedtime on an empty stomach).
10. Ovary Lyph F Ovarian (Nutri-West) support (2 tabs daily with meals).
11. Total Yst Redux (Nutri-West), this is Yeast overgrowth support (3 tabs daily) (all from Nutri-West).

Results: Patient made a fantastic recovery after 6 months of care. She was functioning at about 95%.

Conclusions

As of the final visit before going off to school, the patient indicated that she no longer had diaphoresis, anxiety, nausea, fatigue, or aches. She did recover her menstrual cycle many months later and is doing very well. It has been two years since we have seen this patient. This author's evaluation has lead to the conclusion that this patient may have a hereditary adrenal weakness. This is evidenced by history, response to this treatment and the need to give small but periodic dosages of adrenal support to maintain corrections.

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Treating Emotional Faults with Neurolinguistic Programming & "X" Image Tools

Jose Palomar Lever, M.D.

Abstract

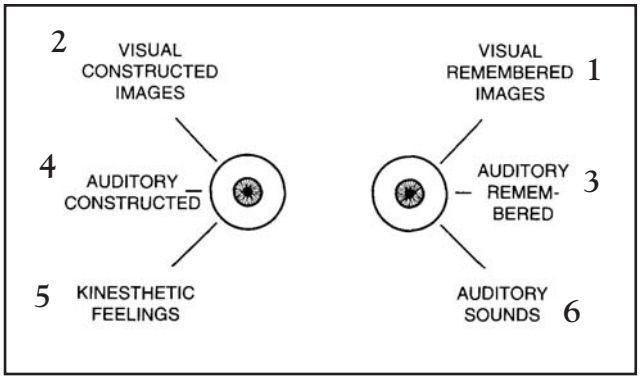
This paper presents a new technique that can be used to treat mental/emotional faults, using a combination of Neurolinguistic Programming (NLP) and an "X" image, uncovering detrimental subconsciously-encoded mental data which can be erased thereby avoiding recurrence of structural &/or chemical faults or as a primary treatment by itself. This technique also bolsters the underlying neuro-emotional link within the triad of health.

Introduction

A basic concept within NLP as described by Bandler and Grinder,[3] is that the eyes move to six different positions to access information corridors within the mind's processes.

The six eye positions, which will activate specific mental – cerebral activity that relate to how a person accesses information for his mind processes, are:

1. Eyes moving to the upper left for visual remembered images.
2. Eyes moving to the upper right for visual constructed images.
3. Eyes moving to the left for auditory remembered sounds.
4. Eyes moving to the right for auditory constructed sounds.
5. Eyes moving to the lower right for kinesthetic feelings.
6. Eyes moving to the lower left for auditory sounds (internal dialog).



For example, if you ask a person the color of his house, he will move his eyes up and to the left as he visually remembers or recalls it. If one is thinking creatively about a house he would like to build, the eyes move up and to the right as he constructs the image. Eyes moving to the left indicate that the person is accessing remembered sounds or words, such as a poem once memorized. When the eyes move to the right, the person is constructing what he wants to tell you, or composing a song. Eye movement down and to the left indicates accessing auditory sounds or words, as if having a conversation with himself. Eyes down and to the right indicate kinesthetic feelings, which include smelling and tasting.

When the patient has a full knowledge of an event, he must move his eyes in all six movements to access a complete range of experience. If the patient has a problem or the experience caused trauma, then the mind blocks a piece of the experience to avoid hurting himself. Normally the mind keeps the noxious piece of the experience in the subconscious. And the eyes won't move to the position related to accessing the injurious subconscious data.

People can access information in ways different to the way they process the same information. For example they can access in visual remembered images and process this information in a kinesthetic way.

To diagnose and treat a mental problem, we need to recall the information from the subconscious, and reorganize, by having the patient look at an "X" image while the injurious process is activated by moving the eyes to the related position. Looking to the "X" draw re-organizes the brain process.[1 2]

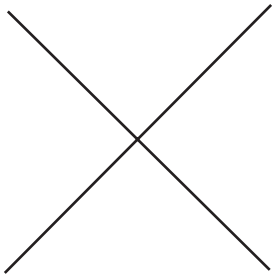
Procedure

Method

I studied 85 random patients, 35% of which were males and 65% were females, seeking consultation for various reasons, and *who either showed positive TL to the emotional Neurovascular reflexes* located bilaterally or the frontal bone eminence (a related weak muscle becomes strong or a indicator muscle becomes weak with TL), or present *symptoms related to an emotional condition*.

1. Initially check for and correct if found EYES INTO DISTORTION (EID) and/or OCULAR LOCK.
2. There will be Positive TL to the emotional Neurovascular reflexes i.e.: A weak muscle strengthens or a strong indicator weakens with the palm of the hand on the forehead, or there would be positive TL to the emotional Neurovascular reflexes while the patient thinks about the symptoms (such as pain, headache, etc) or a specific emotional condition (phobia, etc). Occasionally the emotional neurovasculars will not give a positive TL even though a strong emotional factor is present. Hidden emotional problems may be uncovered by two means: the Conception Vessel is traced by the physician from the beginning (CV1) to its end (CV24) at the lower lip or have the patient insalivate Thymus substance, simultaneous with TL Note: patient must face to the front *without* unfocusing the eyes, since unfocused eyes can access visual images.
3. TL the emotional Neurovascular reflexes while the patient looks to the six different positions. The patient will have one or more eye positions that maintain the positive TL and others that cancel the initial positive TL The eye position that maximally maintains the positive TL is to be used. Sometimes the patient needs to think about their symptoms or about his/her problem to elicit a positive neurovascular reflex. In such case mentalizing the situation/problem preferably should relate to the eye movement. For example: If the established eye position is to the upper left, ask him to think about visual remembered images related to his situation/problem or if the established eye position is to the lower right for auditory sound, ask him to remember his internal dialog when he had the greater symptoms or experienced the problem.

4. Find, if possible, a Visceral Referred Pain area (VRP) or a Neurolymphatic reflex that when rubbed or pinched by the Physician or TL by the patient, cancels the positive indication. Usually the emotion is related to the involved organ like in the Five Elements Associations chart in the Meridians. Example: Kidney with fear, Lung with grief, and so on.
5. While the palm of one hand remains over the Emotional Neurovascular reflexes, the other hand is placed over the VRP of the involved organ found above. For example: liver, (or the navel if there is no VRP) and the eyes are maintained in the position that maintains positive TL while the patient look's at an "**X**" image for an average of 1 to 5 minutes, or until he initial positive TL is negated. Correction is enhanced if the patient thinks about his problem or symptoms in the context related to the eye position as in step 3 above. This procedure will on rare occasions elicit the transitory expression of a new symptom (e.g. Back pain). Continue treating the patient for another minute or so and this new symptom will disappear signaling that the treatment is now complete.
6. Repeat the same procedure if now another eye position is found to be positive.
7. Subsequently, if possible, ask the patient to remember the traumatic event, and check for weakening of an indicator muscle (better if TL to the emotional reflexes), or evaluate the presenting symptoms. Check if the patient moves his eyes to all six positions while speaking about his problem.



Crossed lines

Results

The following results were found:

85 patients with positive TL to the emotional reflexes with any of the six (6) eye movements, a 100% correction were achieved using the visual "**X**" treatment.

All 85 patients report feeling much better after treatment, but 12 of them reported feeling worse for the first 24 to 48 hours after treatment and then feeling much better after that.

83 patients move their eyes to all six positions while talking about their problem after treatment. Two patients have one eye position unused before and after treatment. One was cleared after a second session. 78 Patients with structural problems related to the emotional condition had no recurrence of their symptoms.

Discussion

All emotional problems have their source in the subconscious mind. It has many advantages over the conscious mind (like perfect memory, etc), but the subconscious is unable to criticize or establish the relative importance of the information it receives, thus the information's influence over it is greater. Most Psychological treatment consists of pulling the information forth from the subconscious mind which allows the conscious mind to criticize and compare. We all have the resources within us to achieve what we want. This technique permits the practitioner to treat the emotional problems with or without involvement in the personal problems of the patient, by just recalling the injurious emotion and reorganizing it, allowing the conscious mind to work on it. The therapist is simply there to guide you on your inner journey.

Conclusion

The use of different tools working together has great potential and need much more investigation. Psychological research made by Grinder and Bandler mixed with visual reflexes (like the crossed and parallel lines images) and manual muscle testing together help to treat patients in a faster and easier way, but we need to discover the neurological links existing between them. I believe that visual inputs have the potential to expand the repertoire of valuable diagnosis and treatment tools. This technique is another option for resolving difficult or recurrent cases. The mental side of the triad is as important as the others.

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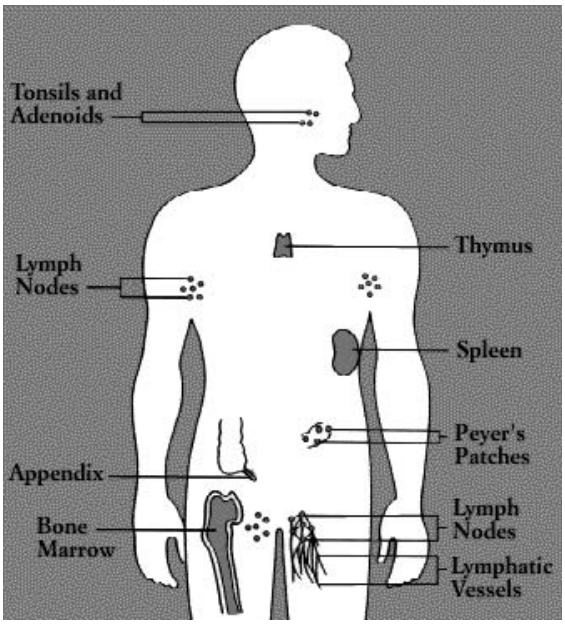
The Immune System Understanding T-Helper Cells

Eric Pierotti, D.C., D.O., Ch.D (Adel)

Abstract

The relevance of T lymphocytes in the maintenance of health and disease has been studied and well understood for some period of time. The unique balance of their various subsets and subsequent cytokine secretions is an accurate indicator of the immune system's response to foreign and or domestic cells that can have both a good and adverse effect on the body. This paper will focus on a better understanding of the role of these lymphocytes (Th1-Th2) and introduce a new finding of bilateral muscle inhibition related to excess secretion of these lymphocytes using manual muscle testing as taught in applied kinesiology.

Introduction



The immune system, an intricate collection of cells and organs evolved over millions of years and whose complex interactions form an efficient system. Under normal circumstances, is system is able to protect the body from foreign invaders and its own altered or mutant cells. Operating throughout the body, the immune system is organized into specific structures which are classified as central lymphoid tissue (such as bone marrow and the thymus) and peripheral lymphoid tissue (which includes lymph nodes, spleen and mucosa-associated lymphoid tissue).

These organs produce specialized cells that comprise the immune system such as

Lymphocytes
B Cells
T Cells
Macrophages

Discussion

The immune system can be divided into two functionally distinct components. Recent studies have discovered these two components are involved in a complex and constant dialogue. These are the Innate or Non-Adaptive (Self) and the Acquired or Adaptive (Non-Self) elements. In order for the body to distinguish "Self" from "Non-Self" almost every cell has been built with a specific identification (Self) tag known as a Major Histocompatibility Complex (MHC). Cells carrying an antigen or a Non-Self tag are identified and help ensure that the immune system does not accidentally try to harm itself.

The T-lymphocyte is regarded as one of the most important parts of the immune system and the control center for both the Self and Non-Self systems. Their role in directly destroying both infected cells as well as altered or malignant cells is vital to health and wellbeing. Their production of various cytokines with an array of specific surface molecules is critical for the control of all other immune functions. As AIDS demonstrates, the destruction of T-helper cells results in the total collapse of the immune system. However it is becoming more, evident that a delicate balance between T-cells and B-cells is vital to a healthy immune system and homeostasis.

B-Cells

These originate from bone marrow and are responsible for the creation of antibodies or immunoglobulins (Ig) which are specific to an antigen and hence are responsible for "Non-Self" or what is termed Humoral Immunity because of it effect in the "humors" or blood. There are five specific immunoglobulins, IgM, IgE, IgA, IgD and IgG, designed to recognize specific antigens, clonally expand and produce many B cells that recognize the same target. B-Cells differentiate into:

Plasma Cells:

- which proceed to secrete vast quantities of immunoglobulins circulating though body searching out and attaching to foreign cells.

Memory Cells:

- which are much smaller than plasma cells. They collect in the lymph nodes and are programmed to recognize the same foreign cell that caused their creation and developement into plasma cells.
- rapidly secrete immunoglobulins (having fought off an infection once) and are able to produce Ig again very quickly by remembering the "enemy."
- allow for immunization and resistance to the same micro-organism(s).

T- Lymphocytes (T-Cells)

Pre T- Lymphocytes also arise in bone marrow and migrate to the thymus where they mature into functional T Cells capable of identifying and responding to foreign antigens in the periphery.

In the periphery, mature T cells can be divided into several major subpopulations, based on the expression of different cell surface marker molecules. There are two distinct subsets of T-Cells, CD4+ and CD8+ which when presented with an antigen give rise to T-Helper Cells (Th1-Th2) and T-Cytotoxic Cells respectively.

In contrast to the immunoglobulin on B cells or soluble antibody molecules, T cells do not recognize free soluble or surface bound antigen, but require the antigen to be processed and presented by an "antigen presenting cell" (APC) also known as dendritic cells. T lymphocytes recognise antigens in the form of short peptides presented in association with "self" class I or class II major histocompatibility complex (MHC) molecules at the surface of an antigen presenting cell (APC). In general, class I present antigens to CD8+ cells and class II presents to CD4+ cells.

T-Helper cells act by releasing cytokines (interleukins) in response to antigenic stimulation. Cytokines are soluble intercellular messenger molecules, which interact with specific receptor molecules on their "target" cells. The release of cytokines allows cells of different types to "talk" to each other in the on-going immune response. A wide range of cytokines are involved in the immune response, each of which has a specific set of activities on its target cell(s). By releasing cytokines in response to antigenic stimulation, T-Helper cells are able to orchestrate an appropriate cell mediated immune response to infection.

T- Helper 1 Cells (Th1)

These participate in cell-mediated immunity and are essential for controlling intracellular pathogens such as bacteria, viruses and fungi. They are also the major defense mechanism for control of tumours.

Th1 cells are produced when dendritic cells (D.C.1) present an antigen to a pre- T cell's receptor site for antigens. The cytokine interleukin 12 (IL-12) is secreted which drives the production of Th1. This further stimulates the newly formed TH1 to secrete their own lymphokines such as Tumour Necrosis Factor (TNF) – beta (TNF-β) and Interferon – gamma (IFN-γ). These lymphokines stimulate macrophages to kill the invading organism by phagocytosis as well as recruit other leukocytes to the site producing a high level of inflammation.

T-Helper 2 Cells (Th2)

These are produced when D.C.2 type dendritic cells present an antigen to the pre T cell's receptor for antigens and presumably one or more paracrine stimulants. The identity of these lymphokine(s) is still uncertain. The major lymphokines secreted by Th2 are interleukins (IL-4), (IL-5), (IL-10) and (IL-13).

T-Helper 3 cells (Th3)

Researchers have identified various regulatory T cells that interestingly were all in association with mucosal immune response. Werner et al coined the term Th3 cells for those cells activated in Peyer's patches after exposure to antigens. It was shown that these Th3 cells produced a powerful immunomodulatory cytokine, Transforming Growth Factor – (TGF-β) and IL-10. Werner's group has suggested that Th3 cells are responsible for the phenomenon of ***oral tolerance*** which is the activation of an antigen-specific non-response to an antigen given via the oral route. Studies in animal models have shown that bowel inflammation is due to an imbalance of pro-inflammatory cytokines IFN-γ, TNF-β and TGF-β with researchers such as Monteleone et al finding markedly reduced levels of TGF-β in the serum of patients with Ulcerative Colitis and Crohn's disease.

Functions of Interleukins

Interleukin 4 (IL-4)

- stimulates production of antibody-producing B cells which lead to the formation of immunoglobulins IgG and IgE.
- stimulates CD8+ cell growth which promotes Th2 cell differentiation. Its effect on macrophages is to inhibit the pro-inflammatory cytokines IL-1,TNF-β and prostaglandin E2 (PGE2).
- inhibits D.C.s from producing IL-12 hence driving the immune response along a Th2 pathway away from Th1

Interleukin 5 (IL-5)

- chiefly a growth and activation factor for eosinophils, mast cell degrannulation and stimulation of B cells and production of immunoglobulins.
- inhibits D.C.s to from producing IL-12 hence driving the immune response along a Th2 pathway away from Th1

Interleukin 10 (IL-10)

-Predominantly found in the gut mucosa it down regulates anti-viral responses by inhibiting the production of Interferon – gamma (IFN-γ), antigen presentation cells and macrophage production of IL-1, IL-6, IL-12 and Tumour Necrosis Factor –alpha (TNF-a). IL-10 is also important in B-cell activation. Increased levels in the

gut tend to be anti-inflammatory by inhibiting pro-inflammatory cytokines from the Th1 pathway such as TNF-β and IFN-γ. Favours the development of '*gut tolerance*' rather than immunity.

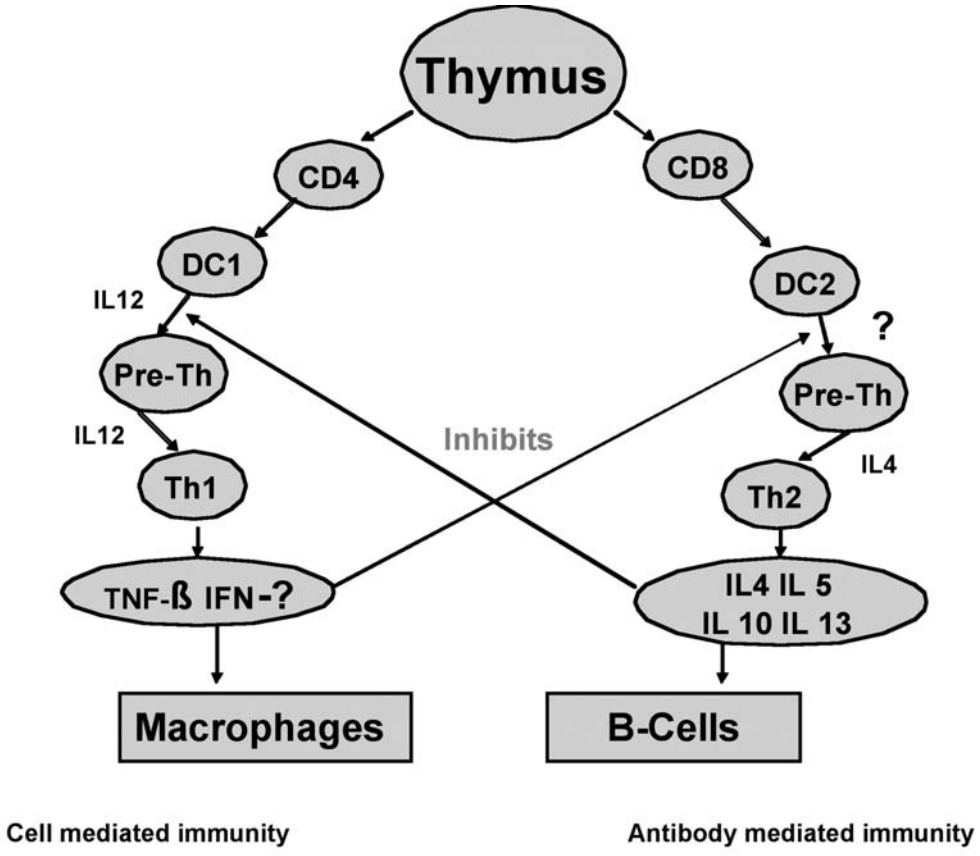
Interleukin 12 (IL-12)

- induces the development of naïve T-Helper cells to differentiate into Th1 cells and is essential for induction of autoimmunity.
- stimulates production of IFN-γ.

Interleukin 13 (IL-13)

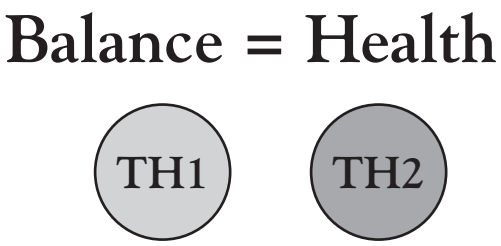
- has functional and structural similarities to IL-4 and promotes B-cell differentiation promoting the synthesis of the antibody IgE.

Tumour Necrosis Factor-β (TNF-β) and Interferon-Gamma (INF-γ) with IL-12 (IL-2) are the principle lymphokines secreted by Th1 cells and stimulate macrophages to kill bacteria which have been engulfed by phagocytosis as well as recruit other leukocytes to the site, producing inflammation. They furthermore inhibit the production of IL-4 from D.C.2 cells driving the immune response away from the Th2 to the Th1 pathway.



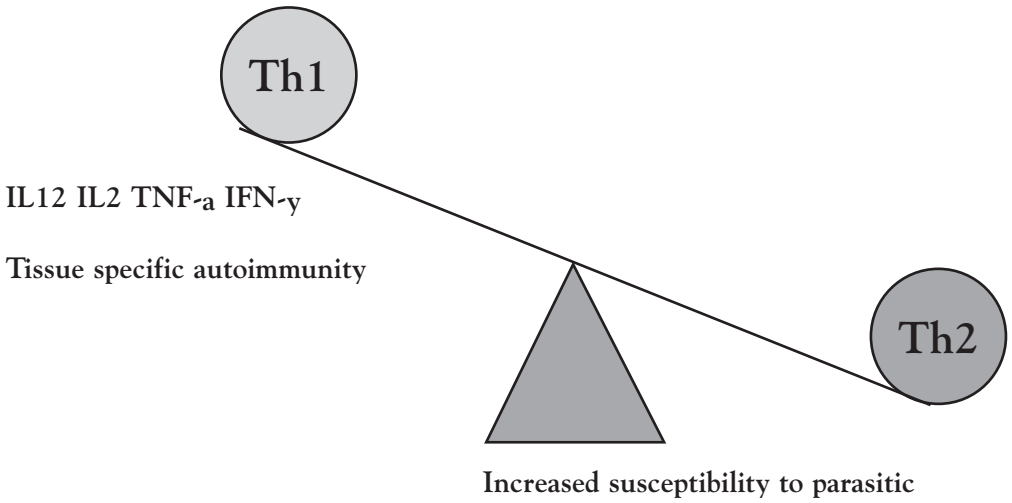
In summary, the tendency to the Th1 pathway has an inhibitory effect on the Th2 pathway and vice a versa with the immunomodulatory Th3 as the pivotal point of balance between the two.

For the immune system to be functionally efficient there has to be a balance between all of its participating elements, especially the T-helper cell subsets. Immune dysfunction or dysregulation, with resultant inflammatory responses, has been shown to contribute to many pathologies and increase the risk factors that comprise the leading causes of disease in western civilisation, such as allergies, autoimmunity and heart conditions. There is strong research to suggest that therapeutic manipulation to balance immune function can have dramatic effects on local and systemic inflammatory processes.



A shift to the dominance of one pathway over another has been linked with tissue-specific autoimmune and hyper-inflammatory conditions.

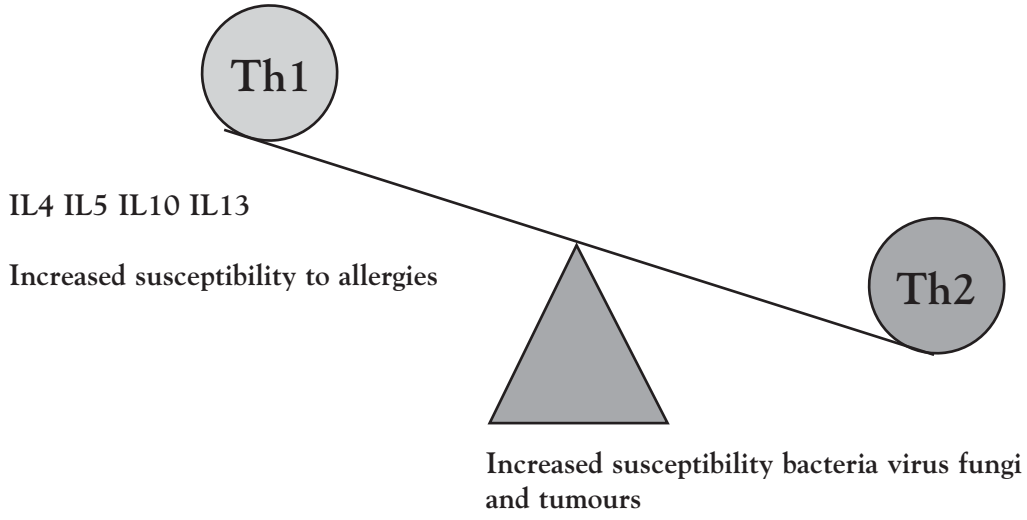
Th1 Excess



The following are some of the conditions that have been found to be characterised by Th1 dominance

Hashimoto's Thyroiditis, Multiple Sclerosis, Type -1 Diabetes, Rheumatoid Arthritis, Vitiligo, Crohn's Disease, Ulcerative Colitis, Psoriasis, unexplained recurrent abortions.

Th2 Excess



The following are some of the conditions that have been found to be characterised by Th2 dominance;

Allergies, Hay fever, Rhinitis, Urticaria, Asthma, Eczema, SLE, Irritable Bowel Syndrome, Chronic Fatigue Syndrome, Graves Disease, (Successful pregnancy).

Etiology of T-Helper cell Dysregulation

A number of causes have been identified as leading to a polarization of T-Helper cells along one or the other pathway. These include:

Stress:

The works of Hans Selye has demonstrated that many of our modern day diseases can be directly attributed to our inability to adapt adequately to stress. Stress can be categorised into:

- **Physical:** the physical stress of work, posture, sport, cumulative effects of accidents even the stress of a sedentary lifestyle.
- **Mental (emotional):** stress of relationships, work, lifestyle, and upbringing even the emotional baggage we are born with.
- **Chemical:** in the form of our diets, quality of air we breathe and exposure to many thousands of chemicals and chemical additives in products we take for granted on a daily basis.

Selye describes three distinct phases of adaptation to stress:

Alarm Phase:

- categorized by a burst of noradrenaline leading to adrenal cortical output, especially cortisol, which in turn suppresses the hypothalamus via a negative feedback loop.

- both adrenaline and cortisol act by blocking IL-12 thus suppressing Th1 cells, but stimulate antigen presenting cells (APC2) and therefore stimulating Th2 cell production. This model explains the highly trained group of athletes that are superbly fit during the season and as finals approach they come down with a debilitating influenza en masse. Exercise generally enhances the immune response, especially Th1 cells, but too much exercise coupled with a long demanding season of niggling injuries, rehabilitation to be right for the next game, the stress of combining sport and home life and the mental stress of the winning mentality all combine to drive the immune response to Th2 cell production with the resultant lack of protection from viruses and bacteria.

Adaptation Phase:

- this phase is characterized by hypertrophy of the adrenal cortex, atrophy of the thymus gland and other lymphoid tissue as well as ulceration of the gastrointestinal tract, leading to hormonal, immune and digestive dysfunctions. Approximately 70% of the immune system is localised in the gastrointestinal tract (Th3) with the mucosa having around 200 times the surface area of the skin. Any compromise of the mucosa-associated lymphoid tissue (MALT) results in increased entry sites for environmental toxins and antigen, so called "leaky gut syndrome" and compromise of general immunity.

Nutritional Deficiencies

Poor and-or improper diets with increased consumption of cooked, processed or heavily refined foods that are denatured of a broad range of vitamins which should act as vital co-factors and anti-oxidants and are essential to immune balance. Heavy consumption of these foods suppresses the Th1 pathway with resultant polarisation to the Th2 side.

- **Vitamin E and Omega 3 essential fatty acids** are very heat sensitive with deficiencies driving a Th2 excess.
- **Zinc deficiency** directly results in Th1 suppression. Studies performed by the Waite Institute in recent years have found that 67% of the population in South Australia was both Zinc and Magnesium deficient. This staggering statistic is most probably reflective of the rest of Australia and the rest of the industrialized world.
- **Chromium deficiency** has a direct link with insulin dysfunction which results in increased insulin production which in turns drives Th2 excess.

Hormonal Dysfunction

- **Estrogen and Progesterone** enhance Th2 expression and suppress Th1 production with the result that tissue specific autoimmune disease is suppressed but allergic responses are heightened. This swing to the Th2 side (from the elevated levels of Estrone) is necessary during pregnancy as it prevents fetal rejection. However the new baby is also born with a Th2 bias and so is susceptible to infection and allergies. The gut is a major player in developing and balancing the infant's immune system (Th3) and is reliant on supply via the mother (from immunologically active components of breast milk) and environment (ingestion of micro-organisms to enhance adequate gut flora) as well as challenges to the Th1 pathway by various endotoxins in the first few weeks of life.
- **Excessive Insulin** as a result of poor dietary choices, high sugar consumption and increased carbohydrate intake initially leads to excessive insulin production and eventual insulin resistance. This has been shown to promote Th2 polarization.

Gut Dysbiosis

- As previously discussed, mucosal immunity plays a powerful role in the maintenance of homeostasis in the local and systemic immune system and control of inflammatory processes. This is strongly influenced by the gastrointestinal environment and the nature of antigen exposure and consequent APC's

which determine the eventual T-helper response. Macrophage response from the innate immune system and subsequent cytokine production signal naïve T- helper cells to differentiate into Th1, Th2 or Th3. The gut flora plays an integral role in the direction that the innate immune response takes.

- Probiotics: some sixteen strains have been identified, including the more common Lactobacillus Acidophilus, Bifidus and the latest Lactobacillus Plantarum 299V are able to modify the mucosal response by controlling and regulating cytokines that ultimately stimulate Th1 cell production reducing bacterial translocation and inflammation by improving enteric flora populations. Ongoing research suggests that other strains may very specifically influence polarisation of one pathway or another. This research is still in the very early stages.

Intracellular Pathogens

Our immune system is constantly being challenged by various organisms in our environment. The over prescribing of antibiotics has in no small way contributed to immune compromise as well as this new overwhelming need for ultra-cleanliness where every surface of our home needs to be sterile for fear our children will fall foul to some horrible disease. As a consequence of this bombardment of advertising propaganda from companies more intent on profit margins and market share than a genuine concern for our health, brainwashed mothers wage a constant battle with bacteria that have been there for ever with every type of antibacterial cleaner available. However, this battle is being won by the "little guys" who simply mutate and become resistant to all we can throw at them. A healthy immune system is not only capable of ***handling*** this but requires these challenges to strengthen and store memory each time this occurs. Intracellular pathogens like *Listeria monocytogenes*, a common food borne bacteria, that infect macrophages, in a shaky immune environment secrete cytokine-like secretions which stimulate the production of IL-10 and results in a Th2 bias and Th1 suppression ensuring their survival. Th1 cells are essential in the control of intracellular pathogens.

Parasites

- In recent times we have witnessed an increase in cases of parasitic infestations in our water supply. The epidemic outbreak of Giardia Lamblia which effectively shut down Sydney's water supply a few years ago and more recently a larger than usual number of patients diagnosed as having been infected by Cryptosporidium in the southern districts of Adelaide, are two examples. Investigation found that the level of this organism was higher than normal in the local water supply but 'within acceptable limits' according to the health authorities. Just what constitutes an acceptable limit? In the past so called "hikers dysentery" and "Bali Belly" was reserved for travellers to third world countries. Medical practitioners are now prescribing more and more Metronidazole (Flagyl) for suspected parasite overgrowth-especially Giardia. According to Dr. D.W.T. Crompton in his article "This Wormy World" published in the Journal of Parasitology, some 342 different species of parasites have been identified that invade the human alimentary canal, varies cavities, circulatory system, skin and tissues. There is also speculation that some 80% of the world's water ways are contaminated by Giardia and various other organisms. This constant exposure to intra and extra- cellular parasites and pathogens is one of the biggest challenges to our immune system.
- Helmiths, the collective name for several types of worm-like parasites including Cestodes such as Tapeworms and Nematodes such as Threadworms as well as Protozoa (Giardia, Cryptosporidium, Entamoeba histolytica) are parasites that create a strong Th2 response with resultant eosinophil activation and excess IgE secretion. The consensus seems to be that they achieve this by secretion of pseudo- cytokines with the activity of IL4 and IL10 driving the response to the Th2 pathway at the expense of the Th1 side. Interestingly, it is the Th2 side which is the defender of parasitic infection, so the reason why this side is initially triggered remains a point of research. Authors such as Dudler,

Machado et al have suggested that the initial Th2 response is relatively harmless in the early stages and that as soon as the response in a specific sense begin to harm the parasite, it induces a Th1 bias by secretion of other pseudo cytokines IFN-? and IL-12 which then suppresses the Th2 pathway. It is then easy to see that outbreaks of threadworms in children, especially in child care facilities, tend towards immuno- suppression with the result that they are subjected to recurrent bacterial and viral infections.

Vaccinations

The ever escalating incidence of allergic disorders in Western Society are of universal concern, with statistics suggesting that every third child in industrialised societies has an allergic disorder. Not surprisingly this trend coincides with vaccination programmes. Reports are now surfacing which question a possible relationship between vaccines and increasing allergies.

Four controlled studies from widely separate geographical regions show a marked elevation in allergic disorders among fully vaccinated children compared to those with limited or no vaccinations (Odent, Hurwitz). Kosecka and Terpstra et al in separate studies found that the vaccines for Hemophilus influenza (Hib) and B. pertussis had a strong propensity to induce hypersensitivity reactions and-or encephalitis. Along a similar line, Taylor Robinson in the journal *Allergy* cited actions of vaccines which shifted the immune profile in favour of the TH2 system and therefore playing a significant role in the rapid increase in atopic disorders.

Although final proof among medical circles is thought to be lacking, there is much indirect evidence that vaccines may be skewing the healthy immune system away from the normally more dominant cellular response (TH1) towards the weaker humoral (TH2) system- which is indisputably associated with allergies and autoimmunity as well increasing vulnerability to viral and fungal infections.

A study by Sudhir Gupta of 20 autistic children (a condition thought by a growing number of parents and physicians to be largely vaccine related) found consistent elevation of humoral cytokines and lowering of cellular cytokines. If vaccines are skewing infants' immune systems by inducing a humoral dominant system at a highly vulnerable time of life, they could be creating double jeopardy from the standpoint of genetic mutations (previous evidence to increased tumour incidents in TH2 dominant individuals)

Diagnosis

Applied Kinesiology Testing

The introduction of high quality homeopathic biomarkers (cytokine kit) from Metabolics UK have made assessment of T-helper cell excess and relative deficiency much more objective rather than reliance on subjective symptom based diagnosis. Simple global muscle inhibition from contact of a specific biomarker indicates a relative excess of that particular test substance, and facilitation of an inhibited involved muscle is an indication of a relative deficiency of the test substance. Since strict AK protocol frowns on evaluation of test substances other than by the placement of the substance in the mouth, there was a need to identify some sort of specific reference zone or muscle indicator that was constant when not only symptoms, but biomarker testing, was suggestive of excess of specific T-helper cells.

Specific muscle to organ association has long been an accepted part of AK procedures. Walther et al have identified the infraspinatus muscle as being specific to the thymus gland and generally involved with immune system dysfunction. Its associated nutrition of vitamins C and A and zinc are also specific nutrients associated with immune stimulation. Other authors have cited the mid deltoid (Portelli, Marcellino) also as being involved in some cases of immune dysfunction when the thymus gland is specific but the infraspinatus fails to elicit any change.

Interestingly, in almost all cases tested in my clinic (around one hundred) neither the infraspinatus nor the deltoids have ever shown an inhibition in "the clear" (which is what would be expected and is taught in the literature, when there is obvious immune compromise). A suspicion of a reactive hypertonicity rather than a hypotonic state as could be found in an "alarm phase" adrenal reaction was discounted by the usual methods of spindle cell techniques as well as meridian tonification point stimulation to inhibit each muscle. No other muscle was found to be "weak" in the clear by general muscle testing and Temporosphenoid (TS) line screening.

However, I found that a challenge to the area of the thymus gland by firm but gentle striking of the mid-body of the sternum with a lateral edge of a closed fist over 4-5 repetitions elicited an unusual and reproducible response on all patients with immune system dysfunction. This challenge causes either:

a) Bilateral inhibition of the infraspinatus
or
b) bilateral inhibition of the mid deltoid muscle, when tested in the usual method.

This elicited inhibition can be negated by therapy localization (TL) of the infraspinatus neurolymphatic point (thymus, 5th ICS right). These cutaneous visceral reflex points in applied kinesiology influence specific organs and stimulate drainage of lymphatic congestion of that organ(s) (Chapman). If we accept the concept of cross linking (TL) an inhibited muscle response to a specific neurolymphatic point which negates the inhibition as relating to an organ, then this would indicate that the thymus gland in this case, is at least involved if not dysfunctional.

Cross checking with specific cytokine biomarkers to the bilateral muscle inhibition found the following pattern;

Bilateral infraspinatus inhibition correlates with Th2 excess

Bilateral mid deltoid inhibition correlates with Th1 excess

This consequential bilateral weakness is negated by challenging with the biomarkers for the various cytokines that relate to one or other of the T-helper subsets. This in my opinion this is further evidence of the relevance and effectiveness of this type of testing protocol.

Furthermore, once initiated this inhibition persists for quite some time, and helpfully allows the challenging of several specific nutrients as necessary in the recovery and balance of the immune system process.

Correcting Immune Dysfunction

The key to correcting immune dysfunction is to balance the Th1 to Th2 ratio so as to be more compatible with homeostasis. Key nutrients and botanicals have recently been identified which play a major role in achieving this balance and a range of other nutrients is available that support tissue repair and control resultant inflammatory responses. These will be discussed individually.

- **Perilla frutescens;** A Chinese herb (Su Zi) which has been used in traditional Chinese medicine for many years for the control of allergic reactions and to "redirect the qi". Contains several flavonoids including luteolin, chryseriol and rosmanaric acid. It been shown clinically to posses anti-inflammatory, anti-spasmodic and immuno-regulatory properties by inhibiting the release of histamine, leukotrienes and prostaglandins. It down regulates the **Th2** cytokines IL-4, IL-5, IL-10, IL-13 production as well as decreases IgE, thereby reducing mast cell degrannulation. This has the effect of moving Th2 dominance more to a homeostatic position.
- **Polypodium leucotomos;** A fern found in Central America and Northern Honduras with a long traditional history of use as a blood tonic. It has been shown in human trials to have powerful immunoregu-

latory effects especially in moderating production of IL-2, IFN-γ and TNF-α while increasing secretion of IL-10 and TGF-β. This has the effect of moderating **Th1** activity and increasing Th2 activity.

- **Coriolus versicolor (Karawatake mushroom)**
- **Grifola frondosa (Maitake mushroom)**
- **Lentinus edodes (Shitake mushroom);** All enhance the proliferation of B and T-lymphocytes; activate macrophages and memory T cells. They have also been shown to stimulate natural killer cells and enhance the effects of chemotherapeutic drugs while reducing their damage to healthy tissue. Strong immune modulators.
- **Plant Phytosterols (sitosterol, sitosterolin);** Trials in South Africa have shown phytosterols to be powerful immune balancers with the paradoxical effect of stimulating Th1 deficiency and suppressing Th2 excesses. Trials on patients suffering allergic conditions and rheumatoid arthritis have shown consistent improvement (≥50%).
- **Shark Liver Oil;** High in Alkyglycerols (as found in bone marrow and breast milk) are stimulators of T cell and NK cell counts.
- **Astragalus membranaceus;** As well as anti-inflammatory and anti-hypertensive properties astragalus balances the **TH1**-Th2 response and enhances phagocytosis, NK cell counts and prevents suppression of macrophage activity and increases B-Lymphocyte activity. Astragalus has proven antibacterial activity particularly against Shigella dysenteriae, Staphylococcus aureus and Streptococcus pneumoniae probably due to its ability to greatly increase Th1 cells.
- **Cat's Claw (Uncaria tomentose);** A herb native to the Peruvian Amazon it contains powerful alkaloids which increase the T-Helper cell production, increase macrophage activity and show strong anti-inflammatory properties. It has been shown to inhibit the progression of viral disease with research demonstrating great potential in the treatment of AIDS.
- **Polyunsaturated Fatty Acids (PUFA's);** All fatty acids decrease IL-12 release in concentration dependant manner with Omega 3 (**Ω**-3) PUFA's (in controlled mouse studies) being the most potent inhibitors. Oils rich in eicosapentaenoic acid and docosahexaenoic acid (EPA/DHA) also decrease INF-? production reducing Th1 bias and acting as a strong anti-inflammatory agent.
- **Probiotics;** As previously mentioned, proper levels of endogenous gut flora play a major role in differentiation of T-lymphocytes to their subsequent subsets. Lactic acid bacteria are not only immuno-regulatory by promoting TGF-β secretion by Th3 cells but provide pro-Th1 activating signals reducing Th2 type responses, improving inflammatory symptoms, intestinal function and bioavailability of nutrients. Good levels of gut bacteria further provide oral tolerance and decrease the prevalence of allergy.
- **Curcumin;** A type of phenolic acid, curcuminoid inhibits IL-12 production driving the Th2 pathway and reducing the inflammatory response. Proven to alleviate the symptoms of Irritable Bowel Syndrome, one of the prominent conditions associated with Th2 excess.

Promoting Tissue Repair and Reducing Inflammation

Antioxidant therapy which induces superoxide dismutase production is useful in controlling free radical tissue damage as well as controlling inflammatory responses and speeding the repair process. Bromelain, flavonols like quercetin, isoflavonoids like diadzein and genistein and various herbs like sillymarin, ginger, curcumin and bioflavonoids are all useful in the control of mast cell degrannulation and consequent histamine production which leads to an increase in inflammatory processes. Adequate levels of levels of zinc, vitamins A, C, E, and beta-carotene are also essential in the repair stage.

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A Tarsal Relationship with the Hamstrings

William H. Tolhurst, D.C.

Abstract

This paper discusses the influence of tarsal subluxation on hamstring strength and resultant pelvic obliquity. It will also outline procedures to diagnose subclinical faults of these same structures.

Introduction

It has been this author's clinical observation that a recurrent hamstring weakness that does not respond to standard applied kinesiology treatment will often greatly be influenced by tarsal subluxation. Review of standard AK texts suggest that this may augment previous tarsal treatment protocols.

Methods

Part of my clinical exam for more than ten years includes standing posture analysis for asymmetry of the pelvis. Supine and prone leg length are also observed. If there are lower back, pelvic, leg or foot complaints, standard AK diagnostic procedures are followed. During this process the hamstrings are tested as a possible indicator muscle in the prone position. If this tests weak and none of the five factors of the I.V.F. influence this fault, I then static challenge possible tarsal bone subluxations to confirm possible lateral talus, posterior calcaneus, or an inferior navicular. Leaf[1] and Walther[2] describe different associated muscles for these same misalignments. Correction of these lesions as described in standard AK texts restrengthens the hamstring and allows for a more reliable correction of the related anterior ilium.

Discussion

Under normal findings as outlined above these procedures are a valuable time saver for persistent hamstring weakness or for a long leg that just won't go away. Practioners even at a beginning AK level can use this protocol reliably. Occasionally these standard methods cannot allow the examiner to have clear clinical findings, especially in athletes. If the hamstrings are testing strong and there are not any clear findings for pelvic obliquity, have the patient bilaterally therapy localize the neurovascular points at the parietal eminence and retest the hamstring on the long leg side. If this tests weak and there are no other associated weak muscles, correct the tarsals as described while the patient TLs these neurovascular points. It is unclear to me why these points affect this condition. The best reason I have is that these points have a relationship with the gastrointestinal system, as do the hamstrings. Therapy localizing these points may increase attention to this system of the body and emphasize a certain stress that brings these hidden conditions to the surface.

Conclusion

There is a simple way to evaluate tarsal subluxations and subclinical (hidden) subluxations. By testing for a weak hamstring with and without TL to the parietal eminence neurovascular persistent anterior ilium (posterior ishium) and weak hamstrings can often be corrected through this evaluation and treatment.

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Secondary Gait Reflexes of the Hand

William H. Tolhurst, D.C.

Abstract

This paper examines certain characteristics of the gait mechanism, expands existing understanding of paired muscles used in running, and introduces cumulative mechanical stress of the hand as a cause of possible gait impairment.

Introduction

Primary ambulation in mature humans relates to bipedal gait with facilitation of walking muscles as described by Goodheart,[1] Leaf,[2] and Walther[3] and their references. There are gait reflexes in the foot known through standard applied kinesiology texts that link specific meridian points to paired muscles of that lower extremity and the contralateral arm or trunk. Expanded discussion of walking gait temporal pattern[4] integrates testing the sternocleidomastoidius, upper trapizius, and deep cervical extensors. In the description of these muscle groups I observed all tests were done with the knee in a non-flexed position. During running the knee joint is actively influenced by a cyclic contraction of the hamstring.

I was curious why there is no mention of the biceps femoris (Hamstrings) as an individual muscle versus the defined posterior group that mainly tests the gluteus maximus paired with the opposite posterior deltoid and tricep. Secondly, I was curious why the biceps brachii is flaccid during walking but highly facilitated during running gait. The third question that needed consideration was the element of infant development as a pseudo quadraped through the crawling phase as well as our genetic relationship with most other mammals that are quadrapeds. "We are structurally biped creatures with quadrapedal nervous systems that allows the vertical bipedal stance and walking ability."[5] In an effort to investigate if other muscles were involved in certain variations of human gait, I postulated that there may be defined pairs of muscles that could have reflex points of the meridian system in the hand.

Materials and Methods

My first attempt at researching my proposed theory was to test random patients in the prone position, testing first the biceps brachii and then the opposite hamstrings. If they both tested strong individually, they were then tested similarly to paired gait muscle testing as previously noted. If either muscle tested weak during that test, meridian points corresponding to the metacarpal-phylangeal joints were tested. In this case SI3 at the fifth MCP joint was therapy localized and proved to be the treatment point to correct this fault.

The following chart was developed using similar investigate testing:

Dorsal Surface of the Hand	Paired Muscle Group
LU10	Infraspinatus and/or Teres minor and contralateral Piriformis
LI3	Supraspinatus and contralateral TFL
TH3	Teres Major and contralateral Gracilis
SI3	Biceps Brachii and contralateral Bicep Femoris

Palmar Surface	Paired Muscle Group
CX8	Wrist Flexors and contralateral Soleus
HT8	Subscapularis and contralateral Pectineus

Methods of testing these muscles simultaneously needed to be developed to get accurate pre and post treatment results. The following descriptions should assist the practioner in his/her exam.

LU 10 Patient supine. Doctor on Teres minor/infraspinatus side interlocking flexed forearms with patient attempting to externally rotate arm testing Teres minor or overhead to test infraspinatus. Doctor's other hand tests against patient's attempt to externally rotate femur.

LI3 Doctor at supine patient's waist level on TFL side and contacts above ankle and opposite forearm above wrist to perform standard TFL supraspinatus test.

TH3 Patient prone. Doctor on Teres major side standard test and uses modified method of graclis test with straight leg in extension lifted off the table and internal rotation. Doctor tests with an anterolateral force.

SI3 Patient prone. Doctor on bicep brachii side with above wrist contact and opposite hamstring standard test.

CX8 Patient standing on one foot with back leaning on wall. Stands on involved ball of foot only. Opposite wrist flexors are tested.

HT8 Doctor on Pectineus side with interlocked forearms testing against internal rotation of the humerus. Modified method of Pectineus with straight tensioned leg and foot. Doctor contacts first metatarsal region of the foot against patient's attempt to internally rotate whole leg. Doctor observes the trochanter region for motion of external rotation. Similar to anterior tibial tubrical drift of popliteus test.

Results

Two AK trained chiropractors used this technique on ten patients over the course of one week and found the following:

Patient Description	Right Hand	Left Hand
Baseball player (right handed)	LI3, SI3, HT8	LI3, SI3, CX8
Part-time Construction (right)	LI3, TH3, SI3, HT8	LU10
Chiropractor (right)	None	None
Construction Worker (right)	LI3, TH3, SI3, CX8, HT8	CX8
Massage Practioner (right)	HT8	LI3, TH3, CX8
Volleyball Player (right)	LU10, LI3, TH3, SI3, CX8, HT8	None
Office Admin (right)	HT8	HT8
Hair Stylist (right)	None	CX8
Chiropractor (left handed)	None	LU10, LI3, CX8
Water skier/mother (right)	LU10	LI3, SI3

Discussion

Although time constraints limited the number of patients examined, these results indicate a pattern of muscle weakness heretofore not considered. I initially began testing patients for this condition in 1996 and as needed applied it; formal statistics were not kept. Leaf[6] describes phases of gait and specific muscles (not groups) involved. Two pairs of muscles in his findings that correspond with mine are biceps/hamstrings and piriformis/infraspinatus. However, the author describes no specific treatment point to integrate these two-paired muscles during gait. Additionally, both Leaf[7] and Walther[8] describe hand stress receptors sites that appear to be a separate type of treatment points of the hand. The implications of these findings open up additional areas of study and injury treatment especially to athletes and people who do heavy repetitive work with their hands. The hitting or hammering hand in certain cases was more affected and a larger group of these individuals needs to be examined to accurately document the influence of this type of stress.

Conclusion

The goal of this study was to investigate additional paired muscle groups involved with gait mechanisms beyond standard walking. Possible influence of meridian points of the metacarpal-phylangael region of the hand were tested and treated to restrengthen specific paired muscles consistently. Further applied kinesiology research in the sports injury field is warranted and would help develop this concept to its full potential.

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Division III

Comments

Overactive Meridians And Food Sensitivity Testing

Paul T. Sprieser, D.C., DIBAK

Abstract

The effect of positive indicator muscle weakness during allergy or food sensitivity testing when the nutrient or food supports the overactive meridian.

Introduction

Over a year ago a long-term female patient with sundry digestive problems asked me to test her nutrient supplements that she had brought to the office in a multiple compartment case. Check each nutrient and one prescriptive item I noted a muscle weakness when the patient ensalivated Armour thyroid (Thyrolar).

I thought this a little strange because the product was natural and she did have a diagnosed thyroid problem. She had been taking Armour thyroid for the past eight years with no problems. Could she have developed a sensitivity to the medication or be reacting to a binder in the table?

Discussion

Having noted this weakness in the patient's record I continued my examination. While check pulse point I found involvement in Tri-Heater meridian, upon checking the alarm point to the meridian I found a high energy or over active circuit. I made my correction to this circuit by way of the Mid-Day/Mid-Night law I found weakness in the Gall Bladder meridian and I treated the connecting point GB-37.[1,2]

I had planned on using Nambudripad Allergy Elimination Technique (NAET) to correct the sensitivity to the Armour thyroid, but to my surprise when I had patient place a small part of the tablet in her mouth she no longer showed any muscle weakness.[3]

I wondered if this was a common factor in overactive meridians that were a universal response? Or was it, as Dr. Goodheart would say "Wednesday night upside down in a canoe" phenomena?

Method

All patients both male and female over the last 13 months that showed any meridian involvement were tested against this nutrient support challenge. Standardized pulse diagnosis using TL to the pulse point and again to the alarm point to determine whether the meridian was over or under active.[4]

From my past experience when examining patient through muscle testing and therapy localization to the pulse point of the wrist, that at least 50% or more of patient's seen will have a meridian involvement in their complaint. This study consisted of 1236 patients showing meridian involvement 827 women and 409 men in this study.

The overactive meridian once identified through the alarm point TL was challenged through the appropriate organ concentrates and vitamins or minerals. Examples of this would by Tri-Heater (T) thyroid concentrate, iodine, RNA-Gall Bladder (GB) vitamin A, and bile salts-Stomach (ST) betaine, stomach concentrate, vitamin B complex etc.[5]

Discussion

The significance of this phenomenon can be understood particularly if you are doing allergy or sensitivity testing with your patients. You must clear all general meridian involvement's before you start you testing for food allergies or sensitivity because the elements you might be challenging could be reacting to the over active meridian. This would be creating a false positive test causing you to make the wrong recommendations to the patient.

Conclusion

Correct all meridian imbalances before nutrient or allergy testing is done.

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The Anterior Atlas of HO Points System Covering Up the Presence of Atlas Laterality

Paul T. Sprieser, D.C., DIBAK

Abstract

The use of therapy localization with the thumbs to transverse process is a simple tool to see whether further investigation of the tendino-muscular meridian HO points need to be examined.

Introduction

For the past eight or so year Dr. Goodheart talked about and demonstrated the presents of a tendino-muscular meridian, known as HO point. The presence of this meridian pattern in our general patients' population is 50% or better on any given day.

I use TL with thumbs to atlas transverse as a screening method to see if the HO points are involved since the atlas is the associated point for all 12 meridians in this system. If there is a positive localization there is better than 90% chance that the HO points are involved. Remembering that right thumb on right atlas transverse process and left on left is the indication of a lateral atlas. Crossed TL with right thumb to left atlas transverse process and left thumb to right atlas transverse indicates anteriority in the mass of the atlas.

Discussion

This is a separate part of the regular meridian system with its diagnostic point at the elbow and knee region rather then the pulse points of the wrist. The other difference is the positive TL will only effect the muscles on the same side where as the wrist pulse points will TL to both sides of the body with an indicator muscle.

Another difference is that each meridian is connected to a specific month. For example, January is bladder, June is thyroid, etc. The diagnostic points are GB-34, BL-54, ST-35, LI-11, SI-8, TH-10, KI-10, SP-9, LIV-8, CX-3, LU-5, HT-3. The other difference is that there are only four treatment points ST-3, GB-13, CV-3 and GB-22. These points are seasonal, meaning that same point is tapped for three months. Winter; January, February and March is ST-3, Spring; April, May and June is GB-13, Summer; July, August and September is CV-3, and Fall; October, November and December is GB-22.[1,2]

A number of months ago I had two hot category #2 back to back, one a man the other a woman. I had checked both for HO point involvement. Both were positive and showed the presence of an anterior atlas. I made my correction to the atlas and treated the appropriate treatment point. Then I listed the category #2, the side involved and which leg was short or long. When the patients were placed face down the leg length reversed just opposite of what I had listed when they were supine. That meant there was a lateral atlas present, but I had already checked that when diagnosing the HO point and the lateral atlas was not present. I wondered if anteriority of the atlas covers up the presence of a lateral atlas, and was this a common occurrence?

Method

Every patient that came into the office was examined for the presence of anteriority of the atlas and also for laterality by the method explained before. When anteriority was diagnosed I would then make a correction followed up by cross TL to the atlas to make sure it was corrected. I then had the patient therapy localize for laterality of the atlas. I examined this with the thumbs on the transverse process of atlas.

What I found after checking 400 patients is when the HO pattern is present about 25% of the time the anterior atlas covers up the presence of atlas laterality.

Conclusion

The presence of hidden atlas laterality being covered up by the anterior atlas in the HO point, is a common enough problem to warrant a recheck after the atlas anteriority correction.

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The New Alarm Points For The Governing and Conception Vessels

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Abstract

Finding the location of the alarm points for the governing and conception vessels of the general meridian system. According to our applied kinesiology textbooks on acupuncture, these two secondary meridians showed the alarm points for the 6.V. to be Gv1 and conception vessel to be Cv24.

Discussion

The Governing vessel is located in the rear centerline of the body. Starting at Gv 1 at the tip of the coccyx, and moving up the center of the sacrum and up the spinous process and ending in the gingiva inferior to the insertion of the frenulum, below the nose at point Gv28. The conception vessel is located in the front centerline of the body beginning in the perineum Cv1 and ending in the gingiva area below the lip at Cv24. These two meridians are referred to as the reservoir of used energy.[1] The pulse points for these two meridians had been discovered by Dr. Goodheart to be located in the palm surface near the base of the thumb. The superficial point is the conception and the deep point is the governing vessel.[2]

These two meridians have associated points at the level of sixth and seventh thoracic vertebra respectively but did not have an alarm point.[3]

In applied kinesiology we know that a weak muscle can be immediately strengthen by placing the tongue to the roof of the mouth or on to Gv26. This places the additional energy from these meridians in the that specific circuit.[4]

When we find an imbalance in these two secondary meridians, how can we tell which is over or under active? We know that each of these meridians has associated muscles. The governing vessel is the teres major and the conception vessel is the supraspinatus. Another method is to challenge the alarm point with a sharp tap of the finger tip. The alarm point for the governing vessel is Gv1 and the conception vessel is Cv24.[5]

The rules of the twelve major meridians should hold true for these two meridians and that is the over active meridian muscle should test strong and the under active meridian associated muscle should test weak.

A few months ago a female patient complained of pain in the area of the coccyx. I had her therapy localize (Gv1) this area with no response. I then had her therapy localize Gv26 with no response, but when both were therapy localized simultaneously I got a positive response with weakening of the gluteus medius indicator muscle.

Maybe there were other points that were the alarm points for these meridians. Since six meridians have their alarm points on the conception vessel, I search each point that was not associated with a known meridian. What I found was that the governing vessel alarm point was Cv22 just above the sternum at the base of the neck. The alarm point for the conception vessel was Cv2, which is at the lower part of the synthesis pubis.

Method

On every patient that I examined I would check the general meridian pulse points and also the separate point for governing and conception vessels. What I consistently found was over activity in the governing vessel and low energy in the conceptual vessel. This was confirmed by testing the teres major. It would test strong and the supraspinatus tested weak unilateral or bilaterally. If what I had found was true, the supraspinatus should strengthen when the patient contacted Cv22 the alarm point for the governing vessel and all other muscles weaken because of the overload. The supraspinatus would strengthen when the conception vessel alarm point was contacted Cv2.

At the present time I have checked this on 110 patients who showed involvement in the governing and conception vessel. I found this muscle pattern to be consistent.

Conclusion

There appears to be two other points that are alarm points for the governing and conception vessels that should be considered when imbalances are found in these secondary meridians.

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