OMT to Improve the Quality of Life in Patients?

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One of the central osteopathic tenets promotes a considered study of our patients’ triune (body-mind-spirit) well-being. While this tenet underlies overall patient Quality-of-Life (QoL), his or her definition of QoL varies depending upon individual values and even on the particular disorder affecting that person.

For these reasons, studying QoL issues may involve measuring pain versus comfort levels; physical versus non-physical perceptions; and functional capacity vs limitations – some being more difficult to study than others.

Recently data related indirectly to QoL has been mined from patient satisfaction data as have measures of empathy as previously discussed at this conference.
Despite being a bit more difficult to measure, the evidence-base needed to understand QoL issues is increasing. Fueled by – and powering – bedside-to-bench & bench-to-bedside observations, osteopathic practitioners are increasingly assessing outcomes (including QoL) by studying the physiology and outcomes associated with the application of one or more of the 5 Models of Osteopathic Healthcare.

Considering the biopsychosocial, neurological-autonomic, respiratory-circulatory, metabolic-bioenergetic, or postural-biomechanical models has inspired new hypotheses which can in turn be tested.
This lecture will attempt to look at improvement in QoL from this vantage point.

- Examples … to improve the QoL … modifying homeostatic mechanisms postulated to upregulate endothelial nitric oxide synthase (eNOS) or enhance cranial hemodynamics.
- Postulate … applying OMT to enhance homeostatic mechanisms to prevent loss of QoL in certain neurodegenerative disorders … as another interesting hypothesis to test.
Points #1–2: Encourage QoL Measures in Osteopathic Research
Still’s Aphorism to Seek Health

"To find health should be the object of the doctor ...

“Health” – “Wellness/Well-Being” – “Quality of Life”
According to the CDC, the difference between well-being and health-related quality of life (HRQoL) is:

- Well-being focuses on **positive** aspect of functioning
- Health-related quality of life focuses on the **negative** affect of functioning & patient outcome
Well-being: an individual’s perception of the quality of their life.

Health-related quality of life (HRQoL): the impact of disease from the patient’s perspective.
Synthesizing scientific literature with advice from its public health partners, the CDC has defined HRQOL as “an individual’s or group’s perceived physical and mental health over time.”

HRQOL as a national health standard can bridge boundaries between disciplines and between social, mental, and medical services.

*Healthy People 2000, 2010, and 2020* identified quality of life improvement as a central public health goal.
Medical Outcomes Study Short Forms (SF-12 & SF-36)

- The SF-36 measures are used by the Health Care Financing Administration (HCFA) and the National Committee for Quality Assurance’s Health Plan Employer Data and Information

Sickness Impact Profile

Quality of Well-Being Scale

Concerns: While many measures have been widely used / extensively validated in clinical settings & special population studies, their length often makes them impractical to use in population surveillance.

Needed! D.O. = “Document Osteopathy”
Find (and MEASURE) Health
Quality of life (QOL) is a **broad multidimensional “body–unit” concept** that usually includes subjective evaluations of **both** positive & negative aspects of life.

- Physical
- Mental/Intellectual
- Emotional
- Spiritual
- Social
- Environmental
- Vocational
Recruited from five sites: Philadelphia College of Osteopathic Medicine in Philadelphia, PA; University of North Texas Health Sciences Center- Texas College of Osteopathic Medicine (TCOM) in Fort Worth, TX; Washington DC Veterans Affairs (VA) Center; Rocky Mountain Multiple Sclerosis Center in Denver, CO and Saint Louis, MO Veterans Affairs (VA) Center.

Of the 111 potential subjects screened at all sites, 92 enrolled in the study; 2 week trial exposure & training

There were 70 subjects @ baseline.

6 weeks= 69 subjects; 65 completed the 10 week session

12-weeks follow-up session (n=56)

The mean age within the study population was 49.8 years and 58% were female.
Example:
Deconditioned Subjects: MS Population


- **RE-ANALYSIS MS FUNCTIONAL COMPOSITE:** Kuchera ML, Vardy TC, Yates H, Ripley B, Stouch B, Johnson JC. Prolonged effects of maximal effort exercise (with Valsalva) and osteopathic manipulative treatment in women with multiple sclerosis (abstract), *JAOA* 2007;107(8):332-333

- **SUMMARY PILOT & MULTICENTER STUDIES:** Vardy TC, Kuchera ML, Dombroski RT. Exercise countermeasures for zero gravity (AAS 12-659). In Robinson JA, Spencer DB (eds).  *Results and Opportunities - The Decade of Utilization (1st Annual ISS Research and Development Conference); Science and Technology Series: A Supplement to Advances in the Astronautical Sciences, American Astronautical Society* (2012); Vol 114: 17-21.
Maximal Effort Exercise (MEE) on IsoPUMP®
Isometric & Eccentric with Valsalva

We Aimed at
Physical ... & Hit QoL Elements
Fatigue is the most common reported symptom among MS patients with prevalence ranging from 60 to 90%. Negative implications on a person’s quality of life by affecting their family and social activities, vocational performance and cognitive processes.

Several research studies show correlation between fatigue, depression, anxiety, mood and decreased QoL within the MS population.
Multiple Sclerosis Quality of Life Inventory (MSQL)

MSQL

- Self-administered test -- measures quality of life in the MS population. It is based on the patient’s perspective of their current health status in prior 4 weeks.
- Two versions – Full = 138 items; Short = 81 items
- 10 individual scales (administer in entirety or in parts).
The **MSQL Inventory Modified Fatigue Impact Scale (MFIS)**

- 21 items re impact of fatigue on a patient’s life and activities of daily living (ADL).
  - **Physical subscale:** impact of physical fatigue on ADL & lifestyle alterations.
  - **Cognitive subscale:** impact of cognitive fatigue on a patient’s ability to think and concentration level.
  - **Psychosocial subscale:** impact of fatigue on a patient’s motivational level and social life.

- Displays high internal consistency and reliability.

Used physical and cognitive subscales to analyze the impact of MEE on mental and physical fatigue.
Pain Effects Scale

- Highly consistent and reliable test
- Goal to determine the extent in which pain and unpleasant sensations affect QoL
- Questionnaire asks subjects to indicate the impact of unpleasant sensation on their ability to walk, sleep, mood and ADL
MSQL Inventory: Multiple Sclerosis Quality of Life Measures

Mean MSQL scores from baseline to end of the exercise protocol and from baseline to six–weeks follow–up.
I don't want to get to the end of my life and find that I lived just the length of it. I want to have lived the width of it as well.

– Diane Ackerman

Recommend: Look into Functional Composite Scores
Measuring objective physical, psychocognitive & physiological parameters together permits assigning a “Body-Unity” value
Point #3:
Enhancing Homeostasis for QoL

Research: Physiology of Exercise & Extrapolation to OMT

- Physiological connections including enhancement of lymphatic flow and upregulation of endothelial nitric oxide synthase (eNOS) when considering interventions such as exercise, OMT to the cranial base, and/or lymphatic pump OMT.
- Potential links to immediate as well as preventive care related to quality-of-life.
Four Tenets of OPP
- Body is a Unit
- Structure–Function Inter–relationship
- Homeostatic Mechanisms
- All 4 should be Applied in Patient Care

Five Models of Osteopathic HEALTH Care
- Biopsychosocial
- Postural–Biomechanical
- Respiratory–Circulatory
- Neurological–Autonomic
- Metabolic–Bioenergetic

Research @ PCOM: Lymphatic Pump Parameters

- **Lymphatic Pump as commonly taught**
  - 120-140 per min
  - "slosh" observed

- **Compared hands-on to machine (accelerometer)**

- **Parameters measured**
  - 130-138 / minute (95% CI)
  - 0.24 – 0.32 G-force (95% CI)

- **Report for reproducibility; permit dose-response; etc**
Current Research for Possible Clinical Application?

Alzheimer Disease: Early Sign = Anosmia

Viral infection

Lymphatic drainage of CSF through the cribriform plate

Olfactory Bulb

CSF in Subarachnoid Space

Bone - Cribiform Plate

Nasal lymphatic

Cervical Lymph nodes

Bone - Cribiform Plate

Nasal Mucosa
Aging: Is there a Common Pathophysiological Pathway for Neurodegenerative Disorders?
Is there a Role for OCMM?
CSF/Venous Drainage
Postulations re Cranial Compliance & CSF Flow

- Transcranial Doppler & Rheoencephalography
- Moskalenko Method
- CC: Altered in Dementia? In Multiple Sclerosis? In Parkinsons? In MS?
- See if ΔPre-Post OMT
Equipment & Finding TCD “Window”
Transcranial Doppler (TCD)
Finding the Windows (Middle Cerebral Artery)

Adjust TCD power settings to identify exact site along the MCA bilaterally.
Bilateral Middle Cerebral Arteries on Transcranial Doppler
CSF mobility in response to voluntary breath holding for 30-seconds (27 y/o)
TCD/REG Measurement Protocol --
Baseline Physio Functions: OMT: Post-OMT Functions

Functional Tests to Physiologically Modulate Vascular Fluid Flow

- Frequency Spectrum (1 minute)
- Respiratory cessation (30+ seconds)
- 7 seconds cessation after inhalation
- 7 seconds cessation after exhalation
- Hyperventilation (20 seconds)
- Stookey test (20 seconds)
- Frequency Spectrum (1 minute)

Also Perform Cognitive Test (PASAT-3) Before & After
Measurements of Cranial Compliance & CSF Distribution of Intra-Cranial Stroke Volume

- **TCDG**: cm/s
- **ΔP**: 3-5 ml of stroke volume changeable component
- **6-7 ml of stroke volume**: Depends on Vascular Resistance (Steady state blood flow)

**Expanding of the Skull (Cranial Compliance)**

**CSF-Movements**
- Inside skull and between skull and spinal cavities
Responses to holding breath & the Stookey test in a healthy young adult male. (Correspond to rest conditions)
CHANGES OF CIRCULATORY–METABOLIC INDICES AND SKULL BIOMECHANICS WITH BRAIN ACTIVITY DURING AGING

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CSF Mobility Changes with Age

MOBILITY OF CSF
(normalized units)

0.0 0.1 0.2 0.3 0.4 0.5

10 before 10-15 16-25 26-35 36-45 46-55 56-65 66-75 AGING GROUPS

AGING GROUPS
Gr I: mentally healthy, Gr II: initial dementia, Gr. III: moderate dementia, Gr IV: pronounced dementia. Significance * $p > 0.1$, ** $p > 0.05$. 

Dementia Stratification (78–84 y/o): Cranial Compliance & CSF
Changes of TCD/REG Pulse Pattern as Result of Application of VENOUS SINUS DRAINAGE TECHNIQUE
(Note increase in compensatory phase)

BEFORE TREATMENT     AFTER TREATMENT

(PATIENT WITH INCREASED INTRACRANIAL PRESSURE)

PULSE PATTERN

SLOPE OF ANACROTA

PHASE RELATIONS
Frank 11/10/2011
Pre-treatment:
Frequency: Appx. 6 cycles/min
Amplitude: .1336 comparative units

Moskalenko Method
Transcranial Doppler Rheoencephalography
MLK Data Pre-OCMM
Concussion Hx
Doubled slow wave frequency
≈ Increased blood flow to brain

Increase in Amplitude directly proportionate to increase in cranial compliance

2nd Harmonic arrival ≈ skull expansion; stems from energy increase of the slow fluctuation

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Post treatment:
Frequency- Appx 114 cycles/min
Amplitude-.1946

Moskalenko Method
Transcranial Doppler
Rheoencephalography
Post-OCMM with CV4

