Integrative Medicine
Approaches to Pain

Donald I. Abrams, M.D.
Chief, Hematology-Oncology
San Francisco General Hospital
Integrative Oncology
UCSF Osher Center for Integrative Medicine
Professor of Clinical Medicine UCSF
University of Arizona PIM Graduate 2004
U. Arizona Program in Integrative Medicine

- Philosophy of Medicine
- Art of Medicine
- Integrative Medicine
- Diet and Nutrition
- Physical activity
- Manual medicine
- Energy medicine

- Mind-body medicine
- Spirituality
- Homeopathy
- Botanicals
- Traditional Chinese Medicine
- Healing environment
- Legal issues
Integrative Medicine

“It is more important to know what sort of patient has a disease than what disease a patient has.”

Moses Maimonides and Sir William Osler
What is Integrative Medicine?

The rational, evidence-informed combination of conventional therapy with complementary interventions into an individualized therapeutic regimen that addresses the whole person (body, mind, spirit and community)
Integrative Medicine

- Provides relationship-centered care
- Integrates conventional and complementary methods of treatment and prevention
- Aims to activate the body’s innate healing response
- Uses natural, less invasive interventions when possible
Integrative Oncology

- Engages mind, body, spirit and community
- Encourages providers to model healthy lifestyles for their patients
- Focuses attention on lifestyle choices for prevention & maintenance of health
- Maintains that healing is always possible even when curing is not
The Tools for Healing: 5 Categories of CAM

- Mind/Body Medicine
- Manual therapy
- Energy Therapies
- Pharmacological & Biological Therapies
- Culturally-Based Healing Traditions
Mind/Body Medicine

- Yoga
- Tai Chi
- Hypnotherapy
- Biofeedback
- Meditation
- Imagery & visualization
- Relaxation therapies
- Spiritual healing/prayer
- Music/art therapy
Manual Therapy

- Massage therapy
  - Swedish, Deep-tissue, Rolfing, Manual Lymphatic Drainage
- Chiropractic manipulation
- Osteopathic manipulation
- Craniosacral therapy
Energy Therapies

- Biofield Therapies
  - Reiki
  - Therapeutic Touch
  - Qi gong

- Bioelectromagnetics
  - Light therapy
  - Magnet therapy
  - TENS units
Pharmacological/Biological Therapies

Diet, Nutrition and Lifestyle
- Dietary supplements/ vitamins
- Elimination diets
- Popular or fad-diets

Herbal Medicine
- Western
  - North American herbs
  - European herbs
- Eastern
  - Traditional Chinese or Ayurvedic herbs
Culturally-based Healing Traditions

- Traditional Chinese Medicine
- Ayurvedic medicine
- Homeopathy
- Naturopathic medicine
- Tribal medicine
Diseases/Conditions for Which CAM Is Most Frequently Used Among Adults - 2007

- Back Pain: 17.1%
- Neck Pain: 5.9%
- Joint Pain: 5.2%
- Arthritis: 3.5%
- Anxiety: 2.8%
- Cholesterol: 2.1%
- Head or Chest Cold: 2.0%
- Other: 1.8%
- Musculoskeletal: 1.6%
- Severe Headache or Migraine: 1.4%
- Insomnia

Conditions for Which the Centers Report the Most Clinical Success

- Chronic Pain: 75%
- Gastrointestinal Disorders: 59%
- Depression/Anxiety: 55%
- Cancer: 52%
- Stress: 52%

Therapies Used (by Number of Centers) for the Top Five Conditions

- Chronic Pain
- Gastrointestinal Disorders
- Depression/Anxiety
- Cancer
- Stress

Study on Integrative Medicine Treatment Approaches for Pain
SIMTAP Overview

- Evaluate the feasibility of assessing impact of IM intervention on chronic pain
- Specific Aim- Assess patient outcomes before, during and/or after a course of personalized treatment at an Integrative Medicine Center
- Measures- pain, quality of life, mood, stress and satisfaction
- Utilization- to calculate costs of IM and Non-IM service over the 6 months of study
Inclusion Criteria

- Age: At least 18 years of age
- Patients seeking their initial treatment for chronic pain at the IM center
- English or Spanish literacy
- Must provide written consent
- Must be able to understand and comply with study requirements
SIMTAP: Patient Demographics

- Total N = 409
- Gender: female = 73%
- Ethnicity: non-Hispanic = 90%
- Race: Caucasian = 81%
- Age: mean 48 (sd 14.2), range 18-88
- Duration of pain: mean 8 years (sd 9); median 5 yrs
- Related to accident: 19%
SIMTAP: Pain Location at Enrollment

- Lumbar Spine 199 (50%)
- Neck 196 (49%)
- Shoulders 184 (46%)
- Knees 143 (36%)
- Hips 139 (35%)
- Sacrum 121 (30%)
- Legs 118 (30%)
- Head 112 (28%)
- Buttocks 111 (28%)
- Thoracic Spine 109 (27%)
- Feet 106 (27%)
Brief Pain Inventory Scales

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>CONSTRUCTS</th>
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<tbody>
<tr>
<td>Worst Pain</td>
<td>Pain Severity</td>
</tr>
<tr>
<td>Least Pain</td>
<td>Patient Pain Experience</td>
</tr>
<tr>
<td>Average Pain</td>
<td>Interference</td>
</tr>
<tr>
<td>Pain Now</td>
<td></td>
</tr>
<tr>
<td>Relations with Others</td>
<td></td>
</tr>
<tr>
<td>Enjoyment of Life</td>
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</tr>
<tr>
<td>Mood</td>
<td></td>
</tr>
<tr>
<td>Sleep?</td>
<td></td>
</tr>
<tr>
<td>Walking</td>
<td></td>
</tr>
<tr>
<td>General Activity</td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td></td>
</tr>
</tbody>
</table>

Mild 1-4
Mod 5-6
Severe 7-10
SIMTAP: Baseline Pain

- BPI Pain Severity Scale: Median 5 (4,6)
- BPI Pain Interference Scale: Median 5 (3,7)
- Worst Pain Last 24 Hours: Median 7 (5,8)
- Least Pain Last 24 Hours: Median 3 (1,4)
- Average Pain: Median 5 (4,7)
- Current Pain: Median 5 (2,7)
- % Relief from current pain treatment/meds: Median 30% (10,60)
SIMTAP: Baseline QOL Measures

- **Health-related QOL (SF-12v2) (0-100*) = 81**
  - Mean Physical Component Score = 37 (sd 10)
  - Mean Mental Component Score = 44 (sd 11)

- **Depression (CES-D 20)**
  - Median 16 (10,25)
  - Depressed ≥ 16: 52%

- **Perceived Stress Scale (PSS – 4) (0*-16)**
  - Median 7 (4,9) [Norm 4.0 sd 2.4]
SIMTAP: Baseline QOL Measures

- Quality of Sleep (0-10* NRS)
  - Median 4 (2,7)

- Fatigue (0*-10 NRS)
  - Median 6 (4,8)

- Sense of Control (0-10* NRS)
  - Median 5 (3,7)
Current Treatments for Pain at Week 24 (N=223)

- Acupuncture, 108 (48%)
- Other*, 91 (41%)
- Massage, 82 (37%)
- Chiropractic, 49 (22%)
- Yoga, 45 (20%)
- Prayer for health, 43 (19%)
- Integrative Medicine Consult, 39 (17%)
- Deep Breathing Exercises, 38 (17%)
- Meditation, 32 (14%)
- Exercise consultation, 25 (11%)
- Psychotherapy, 24 (11%)

*Other includes physical therapy, ice, heat, stretching, bracing, injections

Duke Clinical Research Institute
From Thought Leadership to Clinical Practice
Current Supplements for Pain at Week 24 (N=220)

- Vitamin D, 179 (81%, was 53% at baseline)
- Fish Oil, 142 (65%)
- Magnesium, 71 (32%)
- Other*, 57 (26%)
- Green Tea, 53 (24%)
- Glucosamine, 41 (19%)
- Turmeric, 29 (13%)
- Zyflamend, 17 (8%)
- Mean monthly cost of supplements- $72 ($42 @bl)

*Other includes multi-vitamins, B-complex, St. John’s Wort, flax, fiber
## BPI Pain Severity and Interference Scores

<table>
<thead>
<tr>
<th>PAIN</th>
<th>SEVERITY</th>
<th>INTERFERENCE</th>
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<tbody>
<tr>
<td>Baseline</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Week 6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Week 12</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Week 24</td>
<td>4</td>
<td>3</td>
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</tbody>
</table>

Overall  

- 20% ↓  
- 40% ↓
# Depression Symptoms Score Over Time

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Week 6</th>
<th>Week 12</th>
<th>Week 24</th>
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<tbody>
<tr>
<td>Mean</td>
<td>18</td>
<td>16</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Median</td>
<td>16</td>
<td>14</td>
<td>13</td>
<td>11</td>
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<tr>
<td>% Depressed</td>
<td>52</td>
<td>44</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>SCORE</td>
<td>BASELINE</td>
<td>WEEK 6</td>
<td>WEEK 12</td>
<td>WEEK 24</td>
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<tr>
<td>--------</td>
<td>----------</td>
<td>--------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>SF-12 MCS</td>
<td>43</td>
<td>45</td>
<td>46</td>
<td>46</td>
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<tr>
<td>SF-12 PCS</td>
<td>38</td>
<td>39</td>
<td>40</td>
<td>41</td>
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<tr>
<td>PSS</td>
<td>7</td>
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<td>Sleep</td>
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<tr>
<td>Fatigue</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Control</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

{med 7}
# Work Productivity and Activity Impairment (N=145)

<table>
<thead>
<tr>
<th></th>
<th>BASELINE</th>
<th>WEEK 6</th>
<th>WEEK 12</th>
<th>WEEK 24</th>
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</thead>
<tbody>
<tr>
<td>Absenteeism</td>
<td>9</td>
<td>8</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Presenteeism</td>
<td>36</td>
<td>32</td>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>Work Prod Loss</td>
<td>41</td>
<td>36</td>
<td>34</td>
<td>31</td>
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</table>
SIMTAP: Baseline vs Wk 12 Vitamin D Values

- **Vitamin D**
  - **Mean:**
    - n=351: 32
    - n=216: 40
  - **Desirable (>30):**
    - n=351: 50%
    - n=216: 69%
  - **Insufficient (10-30):**
    - n=351: 47%
    - n=216: 30%
  - **Deficient (<10%):**
    - n=351: 3%
    - n=216: 0%

- hsCRP did not change over the 24 week study
SIMTAP: SUMMARY of FINDINGS

- Chronic pain improved 1 point (20%) on BPI severity index and 2 points (40%) on BPI interference index
- Percent of participants with symptoms of depression decreased from 53% at baseline to 35% at 24 weeks
- Stress and fatigue decreased
- Quality of life and sense of control increased
- Of 145 employed participants, scores decreased for presenteeism (9 to 5), absenteeism (36 to 30) and productivity loss (41 to 31)
In the BraveNet practice-based research network, a personalized integrative medicine intervention for chronic pain was successful in significantly reducing long-standing pain while also impacting positively depression, stress, fatigue, QOL, control and work productivity.
Illustrative Case: Low Back Pain

27 yo male, resident physician, ICU rotation
• single, girl friend, no children
• mid to R LBP for 2-3 weeks
• into R buttock + down leg to lateral ankle
• SLRT L 60° neg, R 70 ° neg
• no clear sensory, reflex or motor deficit
Low Back Pain Epidemiology

• life-time prevalence: 80%
• point prevalence: 12%
• one-month prevalence: 23%
• >85% nonspecific LBP
• >4 w subacute; >12 w chronic
• number 1 cause of disability in US
• 1990 → 2010: years lived with disability: +25%

Deyo 2015 BMJ; US Burden of Disease Collaborators 2013 JAMA
national telephone survey of 2,055 adults

37% had seen a conventional provider and 54% had used complementary therapies for neck or back pain

20% chiropractic
14% massage
12% relaxation techniques

conventional provider

“very helpful”

61%
65%
43%
27%

Wolsko: Spine 2003
Diagnosis and treatment of LBP: a joint clinical practice guideline from the American College of Physicians and the American Pain Society (2007)

RECOMMENDATION 7:

“For patients who do not improve with self-care options, clinicians should consider the addition of non-pharmacologic therapy with proven benefits

- for acute low back pain, spinal manipulation;
- for chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation (weak recommendation, moderate-quality evidence).”

Spinal Manipulation: Definition

application of high-amplitude manual thrusts to spinal joints within their passive range of motion to treat specific, reversible, segmental hypomobility.

universal tradition: China, Greece, Rome, bone setters
**Spinal Manipulation in LBP**

- **UK BEAM trial**: effective for pain, function, and costs in UK NHS above best primary care.
  - UK BEAM trial team: *BMJ*, 2004

- **2004 review**: 31 LBP trials, >5,000 participants:
  - “viable option for treatment of LBP and neck pain”.
  - No complications.
  - Bronfort: *Spine J* 2004

- **2011 review**: 6 studies, cost-effective for neck + LBP (alone or in combination) compared to GP care, exercise and physiotherapy.
  - Michaleff: *J Electromyogr Kinesiol* 2011
Chronic LBP : Massage

Two systematic reviews:

8 RCTs: Moderate evidence for pain and function compared with sham (> exercise, acupuncture, relaxation, self-care education)¹

3 recent RCTs (since 2000): effective for subacute and chronic back pain.²

Massage: How does it work?

Meta-Analysis 2004

37 RCTs, 9 dependent variables:

- Largest standardized effect sizes for multi-dose massage:
- Reduction of trait anxiety and depression, same magnitude as psychotherapy


Mechanism of action: Oxytocin↑. Positive mood. Stress reduction (Cortisol ↓, Serotonin↑)
 Massage

2 systematic reviews
13 RCTs (2008):

- moderate evidence for pain and function compared
  > sham best when combined with exercise and education
  = exercise
  > acupuncture or relaxation or self-care education

Furlan: Cochrane Library 2008
Chronic LBP : Acupuncture

Two meta-analyses:

1) 33 RCTs:
   More effective than sham
     (SDM*: 0.54; 95%-CI 0.35-0.73)
   or no treatment (7 trials)
     (SDM*: 0.69; 95%-CI 0.40-0.98)
   for short-term relief (8 trials)¹.

Insufficient data for short-term effectiveness compared with most other therapies


*SDM= Standardized Mean Diff: 1 unit = 25 mm VAS and/or 6-points RM
chronic LBP: Acupuncture

2) 35 RCTs: Acupuncture, added to other conventional therapies, relieved pain and improved function better than conventional therapies alone. However, effects are small.

Furlan et al, *Spine* 2005:30(8)944-63
Acupuncture: How does it work?

Endorphins, serotonin, substance P, cortical effects, mechano-transduction? Expectancy?

Acupuncture: How does it work?

Pooled analysis of 4 RCTs (n = 864)
12 sessions of acupuncture vs. sham acupuncture (migraine, tension HA, cLBP, knee osteoarthritis):

OR for personal expectations at baseline for acupuncture to be effective: 2.03 (1.26-3.26)

“In our trials a significant association was shown between better improvement and higher outcome expectations.”

Linde et al. *Pain* 2007; 128(3)264-71
Yoga for Chronic LBP

- Use nearly doubled 2002-2012

4 RCTs: clinical meaningful benefit for pain compared with self-care booklet¹ or waitlist / usual care² but not when compared with conventional therapeutic exercises¹ or stretching⁴

- meta-analysis (10 RCTs):
  strong evidence for short-term, moderate evidence for long-term effectiveness for pain and function.⁵

¹ Sherman et al, Ann Intern Med 2005
² Jacobs et al, OCIM UCSF, unpublished
² Williams et al. Spine 2009:
⁴ Sherman et al. Arch Intern Med 2011
⁵ Cramer: Clin J Pain 2013
Chronic LBP : Mind-Body Therapies

- Mindfulness Based Stress Reduction (MBSR) Group Program

8-week course developed at Pain Center in Mass Gen Hospital by John Kabat-Zinn (~4 hrs/w)

Non-denominational teaching based on Vipassana meditation and Yoga.

Observational studies or non-RCTs: significant benefit for patients in chronic pain parallel to reduced anxiety and distress.
DR. WEIL’S ANTI-INFLAMMATORY FOOD PYRAMID

HEALTHY SWEETS (such as plain dark chocolate) Sparingly

RED WINE (optional)
No more than 1-2 glasses a day

SUPPLEMENTS
Daily

TEA (white, green, oolong)
2-4 cups a day

HEALTHY HERBS & SPICES (such as garlic, ginger, turmeric, cinnamon) Unlimited amounts

OTHER SOURCES OF PROTEIN (natural cheeses, lowfat dairy, omega-3 enriched eggs, skinless poultry, lean meats) 1-2 a week

COOKED ASIAN MUSHROOMS
Unlimited amounts

WHOLE SOY FOODS (edamame, soy nuts, soymilk, tofu, tempeh) 1-2 a day

FISH & SEAFOOD (wild Alaskan salmon, Alaskan black cod, sardines) 2-6 a week

HEALTHY FATS (extra virgin olive oil, expeller-pressed canola oil, nuts - especially walnuts, avocados, seeds - including hemp seeds and freshly ground flaxseeds) 5-7 a day

WHOLE & CRACKED GRAINS
3-5 a day

PASTA (al dente)
2-3 a day

BEANS & LEGUMES
1-2 a day

VEGETABLES (both raw and cooked, from all parts of the color spectrum, organic when possible) 4-5 a day minimum

FRUITS (fresh in season or frozen, organic when possible) 3-4 a day
Supplements for Chronic Pain

- Cannabis
- Glucosamine-Chondroitin
- S-adenosyl methionine (SAMe)
- Turmeric
- Zyflamend®
- Bitter cherry
- Vitamin D
IM Therapies in Low Back Pain

- Benefits of many IM therapies may be small or nonspecific, however.
- They appear to be real and maybe substantial enough to help patients.
- Conundrum for us who believe in EBM: Should we reject treatments found to help through nonspecific effects?
  - or take advantage of nonspecific effects?
“The role of the physician is to cure sometimes, heal often, support always.”

Ambroise Pare