

Interdisciplinary Pain Rehabilitation – When Pills, Potions, & Procedures are Inadequate

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Treatments Options

- **Pharmacological**
- **Surgical**
- **Neuroaugmentative (e.g., nerve block, spinal cord stimulation, implantable pumps)**
- **Physical modalities (e.g., exercise, TENS, ultrasound)**
- **Complementary (e.g., acupuncture, chiropractic)**
- **Psychological (e.g., biofeedback, cognitive-behavior therapy, hypnosis, relaxation)**
- **Multidisciplinary / Interdisciplinary**

Treatments for Pain - What's changed over the past 3,500 years?

Historical



Current



Future

What's the Evidence for Treatment Efficacy?



Monotherapies Only Modestly Successful

- **Injury prevention** programs for back pain have had minimal effects
- **Medications** (opioids, NSAIDs, anti-depressants, anti-convulsants, muscle relaxants, topical agents) reduce pain by ~**30%–40%** and in **fewer than 50%** of patients, and often with little if any improvement in physical functioning¹⁻⁵
- In **opioid** (putatively the most potent drugs) studies, from **19% to 50%** of patients terminate prematurely in clinical trials due to lack of efficacy or unacceptable adverse effects^{2,5}

¹Eisenberg et al. JAMA 2005;293:3043-52;²Turk et al. Lancet 2011;377:2226-35;³Stainer et al. Spine, 2003;28:2540-5;⁴Moore et al. The Cochrane Library 2011, Issue 3;⁵Reinecke et al. Br J Pharmacol 2015;172:324-33

Monotherapies Only Modestly Successful

- **Injections** (epidural steroids, trigger point, nerve blocks) are the most commonly performed pain management procedures yet there is no evidence of positive short-term effects of injection therapies and the long-term effects are unknown¹⁻⁴
- Although the numbers are increasing, a substantial proportion of patients who receive **spinal surgery** continue to report significant pain, functional impairment, and complications⁵ and for orthopedic conditions, sham surgery as effective as true surgery⁶
- **Implantable devices** are expensive and even carefully selected patients are not pain-free and have modest improvements in physical functioning⁷

¹Luijsterburg et al. Eur Spine J 2007;16:881–99;²van Tulder et al. Eur Spine J 2006;15:S89-92;³Bicket et al. Anesthesiology 2013;119:907-31;⁴Scott et al. Pain Med 2009;10:54-69;⁵Deyo & Mirza Clin Orthop Rel Res 2006;443:139-46;⁶Louw et al. Pain Med 2017;18:736-50;⁷Turk et al. Lancet 2011;377:2226-35

Monotherapies Only Modestly Successful

- Although **psychological factors** have been shown to predicting disability;¹ influencing perceptions and experience of noxious sensations;² directly affecting physiological processes (CNS, hormonal, peripheral);³⁻⁵ affect emotional responses to pain;⁶ affect behavioral responses to pain;⁷ influence responses by significant others;⁸ and Influence response to treatments...⁹⁻¹¹

¹Arnow et al. Gen Hosp Psychiat 2011;33:150-6;²Edwards et al. Clin J Pain 2006;22:730-7;³Colloca et al. Eur J Pain 2006;10:659-65;⁴Kucyi et al. J Neurosci 2014;34:3969-75;⁵Jensen et al. Pain 2012;153:1495-503;⁶Lumley et al. J Clin Psychol 2011;67:942-68;⁷Turner et al. Pain 2000;85:115-25;⁸Goubert et al. J Pain 2011;12:167-74;⁹Benyon et al. Musculoskel Care 2010;8:224-326;¹⁰Burns et al. Behav Res Ther 2003;41:1163-82;¹¹Wertli et al. Spine J 2014;14:2639-57

Monotherapies Only Modestly Successful

- **Psychological treatments alone result in modest benefits in pain and physical and emotional functioning and for select disorders.¹⁻¹⁵ However, evidence for long-term effects is inadequate, and evidence is somewhat contradictory for effects on vocationally relevant outcomes¹¹⁻¹⁴**

¹Edwards et al. Clin J Pain 2006;22:730-7;²Colloca et al. Eur J Pain 2006;10:659-65;³Kucyi et al. J Neurosci 2014;34:3969-75;⁴Jensen et al. Pain 2012;153:1495-503;⁵Lumley et al. J Clin Psychol 2011;67:942-68;⁶Turner et al. Pain 2000;85:115-25;⁷Goubert et al. J Pain 2011;12:167-74;⁸Benyon et al. Musculoskel Care 2010;8:224-326;⁹Burns et al. Behav Res Ther 2003;41:1163-82;¹⁰Wertli et al. Spine J 2014;14:2639-57;¹¹Hoffman et al. Health Psychol 2007;26:1-9;¹²Morley et al. Pain 1999;80:1-13;¹³Henschke et al. Cochrane Database Syst Rev 2010;20:CD002014;¹⁴Dixon et al. Health Psychol 2007;26:241-50;¹⁵Montgomery et al. Int J Clin Exp Hypn 2000;48:148-53;¹⁵Jensen & Patterson J Behav Med 2006;29:95-124

Treatments for Pain Only Modestly Successful

- Assessment of **1,016** Cochrane review articles¹
 - **44%** of the pain treatment interventions likely beneficial
 - **7%** harmful
 - **49%** inconclusive as to benefit or harm
- Majority of patients in drug trials have sufficient pain at the end of the trial to make them **eligible for another trial** (pain > 4/10)!
- Rehabilitation Programs may be reasonable options; however, long-term benefits of **any** of the current treatments are largely unknown²

Outdated Biomedical Perspective on Chronic Pain

- Pain viewed as solely a **signal of injury** directly related to **objective physical pathology**
- Continual quest to find **THE** structural cause
- Attempt a “**mechanical fix**”
- Provide purely **symptomatic** treatments
- **Active provider** takes over responsibility and control from the **passive patient**

Some Challenges to the Biomedical Perspective

- Patients with **minimal objective evidence of pathology** often **complain of intense pain** – False Negatives (*Disease Deficit Disorder?*)
- **Asymptomatic** people often reveal objective evidence of structural abnormalities using various imaging procedures – False Positives¹⁻⁶ (*Patients in waiting?*)

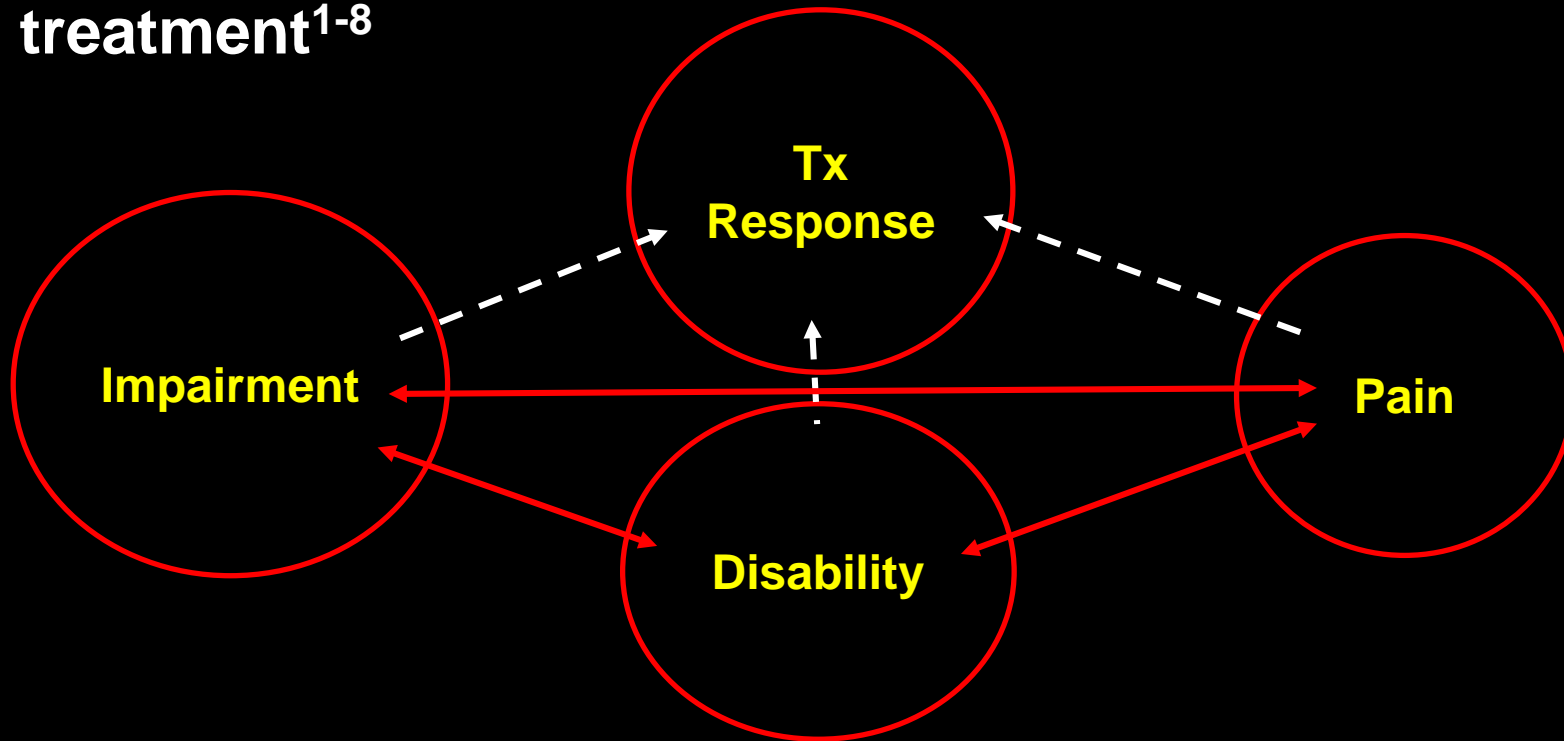
¹Hilselberger & Witten. J Neurosurgery 1968;24:204-8;²Wiesel et al. Spine 1984;9:199-206;
³Holt. J Bone Joint Surg (Am) 1968;50:720–6;⁴Boden et al. J Bone Jt Surg 1990;72-A:403-8;
⁵Jensen et al. NEJM 1994;331: 69-73;⁶Brinjikji et al. Am J Neuroradiol 2015;36:811–16

Some More Challenges to the Biomedical Perspective

- Patients with the **same** extent of tissue pathology, treated with **identical interventions**, **respond in widely different ways**
- **Surgical procedures** designed to inhibit symptoms by severing neurological pathways believe to be the generator(s) of pain may **fail** to eliminate or even alleviate it substantially
- Often, even when spine surgery is a **technical success**, it is simultaneously a **clinical failure** -- patients continues to experience pain and disability despite correction of underlying pathophysiology

Even More Challenges to the Biomedical Perspective

- There are only modest correlations among physical impairments, pain reports, disability, and response to treatment¹⁻⁸



¹Hilselberger & Witten, J Neurosurg 1968;24:204-8; ²Holt, EP J Bone Joint Surg Am 1968;50:720-6; ³Wiesel et al. Spine 1984;9:199-206; ⁴Boden et al. J Bone Joint Surg 1990;72-A:403-8; ⁵Jensen et al. N Engl J Med 1994;331: 69-73; ⁶Kovacs et al. Spine 2004;29:206-10; ⁷Van Duijn et al. Spine 2004;29:178-83; ⁸Dunn et al. Bone Joint Surg Am 2014;96:793-800

No single treatment eliminates all symptoms for all people with chronic pain even if they have the same diagnosis

Thus, to improve outcomes we should be considering combinations of treatments for patients with chronic pain -- psychological as well as pharmacological and physical. A place for Interdisciplinary Pain Rehabilitation

Sometimes 1 + 1 does = 3

Multi/Interdisciplinary Pain Rehabilitation Programs (IPRPs)

- Psychological treatment are frequently incorporated within IPRPs
- Despite the recalcitrance of the pain problems of the patients treated at IPRPs, there are a growing number of studies, reviews, and meta-analyzes that support the clinical efficacy of IPRPs¹⁻⁶
- but not all⁷⁻⁸

¹Eccleston et al. Cochrane Database Syst Rev(2) 2009;CD007407;²Gatchel & Okifuji J Pain 2007;7:779-93;³Guzman et al. Br Med J 2001;322:1511-6;⁴Hoffman et al. Health Psychol 2007;26:1-9;⁵Scascighini et al. Rheumatology 2008;45:670-8;⁶Norlund et al. J Rehabil Med 2009;41:115-21;⁷Karjalainen et al. Cochrane Database Sys Rev 2000:CD001984 [FM & Musculoskeletal];⁸Karjalainen et al. Cochrane Database Sys Rev 2003:CD002194 [Neck & Shoulder].

Meta-Analysis Patient Characteristics Interdisciplinary Pain Rehabilitation Programs

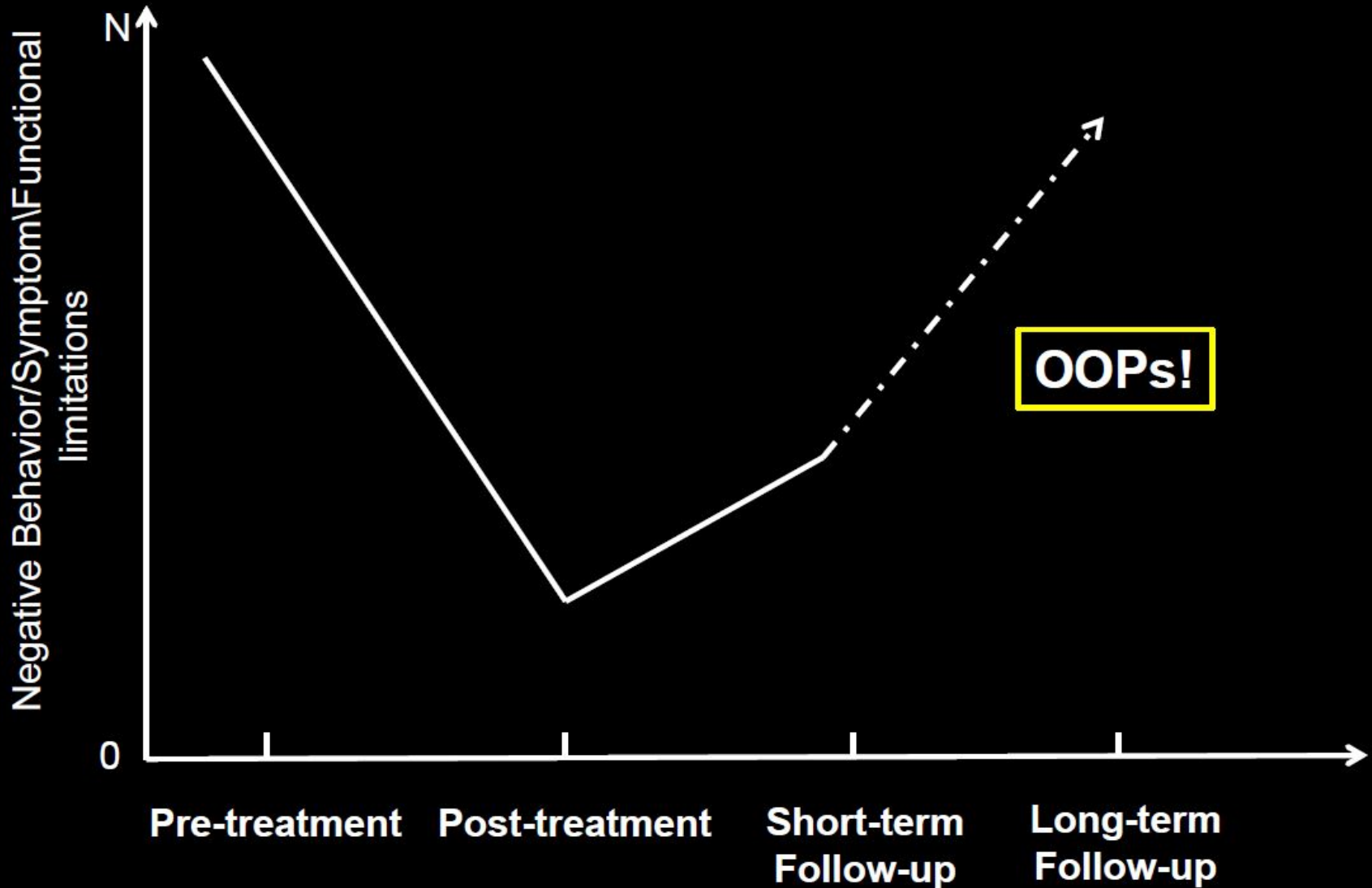
	Mean	Range
Age (yrs.)	44.93	34.5 – 56.0
Duration of Pain (mos.)	85.43	13 – 756
% Working	34.17	0 – 100
% with Litigation/ Compensation	20.53 / 51.64	0 – 63 / 0 – 63
% >1 Surgery	54.40	28 – 100
Mean # Surgeries	1.76	.4 – 4.60
% Taking Pain Medications	84.54	53 – 100

Pain Rehabilitations Programs – What Do They Consist Of?

- Multi/Interdisciplinary is a **generic phrase**, there is a great deal of variation in the specific aspects of the treatments offered and the formats
- Thus, there is **no standards** but there are some **general characteristics** that they share
 - Several disciplines involved (e.g., physician, nurse, PT/OT, psychologists)
 - Rehabilitation **not** cure
 - Elimination/reduction of opioids
 - Emphasis is on **self-management** and activity
 - Physical conditioning and **functional improvements**
 - Behavioral treatments (e.g., coping skills, work to exercise quota vs. pain)



Typical Pattern of Treatment Response



How Can Maintenance Be Facilitated?

Controlled Processing --

increased attention, thought
guide behavior

- When first learn new skills
- Circumstances novel
- Situation demanding

For example,

- Playing an instrument
- Driving in heavy traffic, inclement weather, unfamiliar area

VS.

Automatic Processing--

decreased attention,
thought guide behavior

- Routine
- Habitual
- Self-reinforcing

For example,

- Buckling seat belts
- Flossing teeth
- Weekly weight check

Is Maintenance Enhancement Possible?

- Longer treatment?
- Different emphases and proportions of time?
- Take in to consideration patient preference?
- Incorporate patient goals?
- Treatment matching?
- Involve significant others?
- Make use of advanced technologies?
- Transfer into natural environment?
- Booster sessions?
- **Anticipate and be proactive !**

Comments About Pain Rehabilitation Programs

- Attention needs to be given to attempting to identify characteristics of **responders** so that treatment may be prescribed to improve the likely outcomes
- Long-term follow-ups are required to demonstrate **maintenance** of benefits over time and **generalization** of outcomes beyond the clinical context
- It is important to acknowledge that they do not offer cures -- **not going to eliminate all pain for all patients**
- We should not be naïve to assume that the major lifestyle changes required will continue without some long-term continuity of care and reinforcement of skills learned and **encouragement for persistence and resilience** in the face of a chronic, symptomatic disorder

The **WRONG** question

“Is Tx A effective?”

What are the right questions?

To answer, need to consider some background

Snapshot vs. Motion Picture

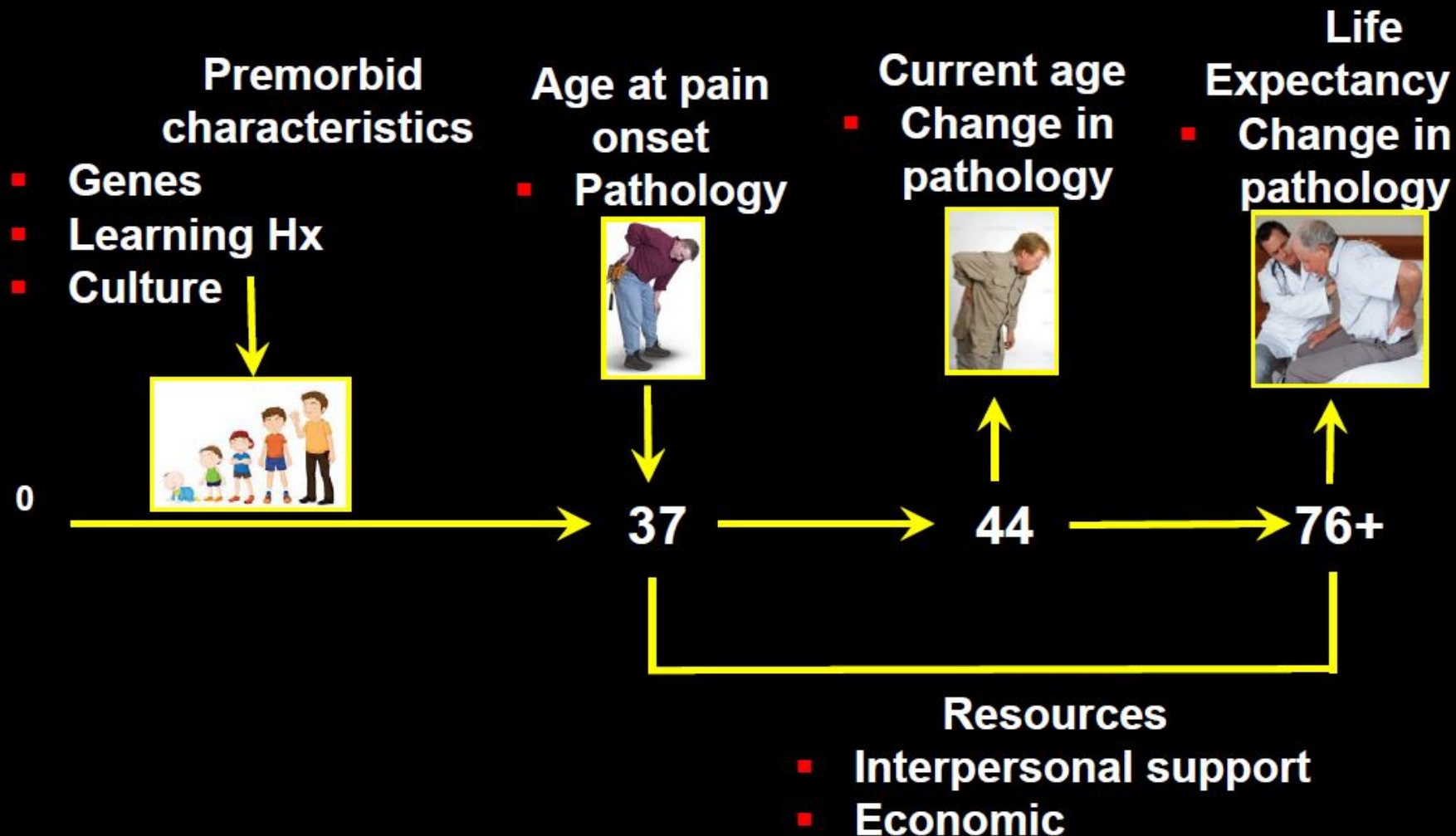


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Longitudinal (Motion Picture) vs. Cross-sectional (Snap Shot) Perspective

Socioeconomic Context



Treatments for Pain Only Modestly Successful – What to do?

There are two kinds of people in the world...

those who think there are two kinds of people and those who don't.

The first group can be labeled **splitters, the latter **lumpers**.**

Patient Uniformity Myth

Tendency to **treat patients** with the same diagnosis as a **homogeneous group**

Patient Uniformity Myth

Ignoring patient heterogeneity

Treating all patients the same

Inconsistent results

Little understanding of what treatment(s) works

and for whom



New Way of Thinking About People with Chronic Pain

Must assess and address:

- The **biologic basis** of impairment and pain
- Individual's **history**
- The patient's **attitudes and beliefs, emotions, and behavior** not just pathology
- Coping, social supports, and financial **resources available**
- Responses by **significant others**
- **Context** in which a person/patient resides
- **Social, work, and economic** influences and impact

Some of the **RIGHT** Questions

- Is Treatment A more **clinically** effective than Treatment B?
- On **what criteria** (symptoms, functioning, health care utilization, satisfaction)?
- **Measured how and by whom** (e.g., self-report, performance, electronic records)?
- With what **adverse effects**?
- Are the effects **maintained** if not by what means can they be **augmented**?
- Initiated **when, by whom, how, and at what “dose”**?
- For **whom**?
- What are the **necessary and sufficient components**?
- Is Treatment A more **cost** effective than Treatment B?

Some Challenges and Opportunities

- Chronic pain - **huge** and **growing** with aging population
- Majority of pain management occurs within **primary care**, yet disproportionate research attention given this effective means to **early intervention**, the **prevention of disability**, and **maintenance** over long periods of time
- Lack of adequate **biomarkers** of pain
- Limited understanding of **associations of subjective and performance-based** measures of function

Some Challenges and Opportunities

- **No** significant advances for “**cures**” on the horizon
- Development and evaluation of **early intervention** strategies to **prevent disability** within primary care needed
- Traditional biomedical model is inadequate
- Wide **variability in response** to existing treatments
- Monotherapies provide modest benefits, develop and evaluate **treatment combinations**

Some Challenges and Opportunities

- Maximizing **patient acceptance** of treatments and treatment demands (e.g., exercise, home practice, self-management, side-effects)
- Individualization of strategies to **facilitate the motivation, self-management, and resilience** of those impacted
- **Maintenance** enhancement of benefits over time and **generalization** of outcomes beyond the clinical context relatively untapped area
- Since symptoms will persist, **long-term** monitoring and support for those effected will be required by **health care providers** and **significant others**

Some Challenges and Opportunities

- Development and evaluation of strategies to **promote and reinforce adherence and maintenance**
- Identification of strategies for **identifying “slips”** and interventions **prior to total full-blown relapse**
- **Availability** of effective treatments and treatment components may be limited and **costs** may be prohibitive

Some Central Questions

- **What treatments** should be implemented for **which problems**?
- What best **format** (individual, group, technology-augmented for treatment and maintenance enhancement)?
- What **combinations** of treatment components optimal [additive, synergistic, iatrogenic (too much diminishes treatment effect; decrease engagement & adherence as requirements increase, negative effects of excessive demands)]?
- Is treatment **acceptable to patients** (enrollment, engagement, motivation, side-effects, persistence, long-term adherence, attrition)?

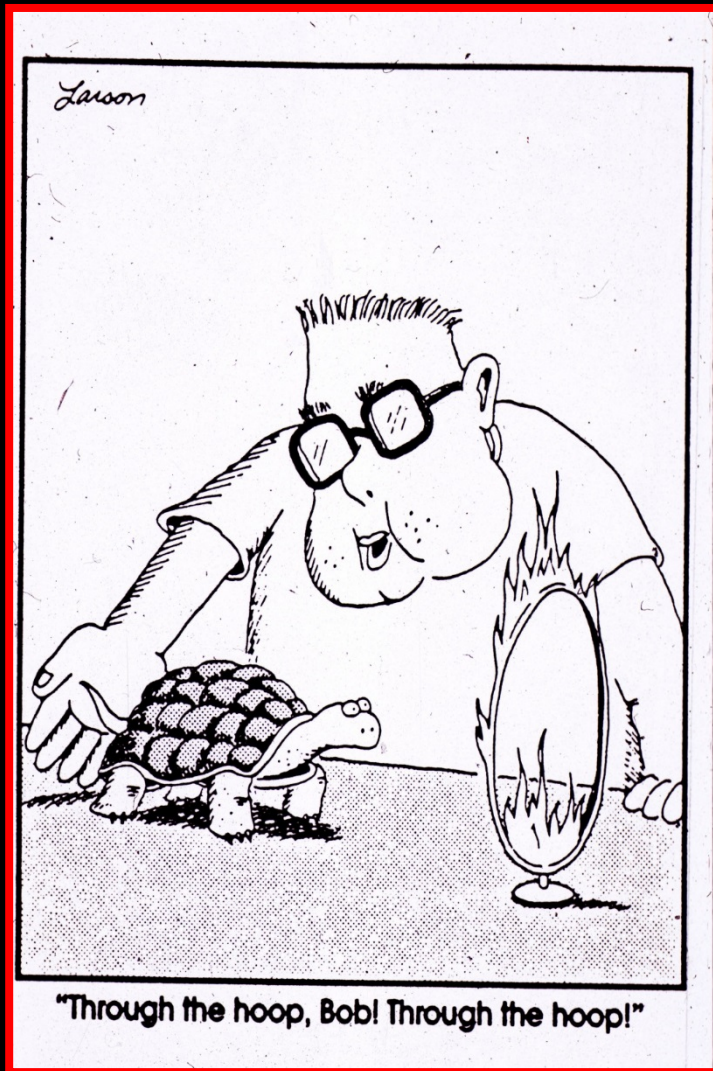
Some Central Questions

- What are the physical and psychosocial **mechanisms** underlying successful outcomes (moderators)?
- How should treatment **success be determined** (e.g., symptom severity, physical function, work performance)?
- **Who should determine the success** of treatments (patient, provider, third-party payer compensation provider)?
- Are initial benefits **maintained & generalized** outside hospital, clinic, clinicians' office?

Some Central Questions

- What are the **economic trade-offs** of treatment components?
- Is more treatment better? – **dose-response** [how much optimal, necessary, sufficient to maximize acceptance, outcomes, and maintenance]?
- Can treatments be **matched** to patient characteristics lead to improved acceptance, outcomes, and maintenance?

Lots of challenges and opportunities but progress has been slow and needs to accelerate because the need is great and growing!



Need for a National Pain Strategy