Born down in a dead man's town
The first kick I took was when I hit the ground
End up like a dog that's been beat too much
Till you spend half your life just covering up
Born in the U.S.A., I was born in the U.S.A.
I was born in the U.S.A., born in the U.S.A.
More than one third of U.S. adults were prescribed opioids in 2015.

The most commonly reported motivation for misuse was to relieve physical pain (63.4%).

Over 10% misused.
US Opioid Epidemic...

Americans, constituting only 5% of the world's population, have been consuming 80% of the global opioid supply, and 99% of the global hydrocodone supply.


The way we have looked at pain is...

Louw, A. (2016). “If we’re so good, then why are our patients so bad?” Pain and Rehabilitation Summer 2016(41): 4-5.

Rene and the Renaissance Period...

- Mechanical view
- Hollow tube with a cord, valves and spirits

Putting Out Fires…

Medical

- Medication, etc.
- 423% increase in expenditures for opioids for back pain in Medicare patients

Rene and the Renaissance Period…

- Mechanical view
- Hollow tube with a cord, valves and spirits


Born to Run?

If We Are So Good, Why Are Our Patients So Bad Off?

What's wrong with Rene?

- **Assumption**: there is a direct link between the amount of tissue damage and the level of pain experienced. (Patients truly believe this)

- All pain is caused by injury and increased pain means more damage

- Pain is either physical or psychological (mental versus physical)

- In chronic pain tissues are not healing and damage is ongoing

- Nociception and pain is synonymous


Gifford LS. Pain, the tissues and the nervous system. Physiotherapy. 1998;84:27-33.

Who is to Blame For the Current Opioid Crisis?

Stagnant Physical Therapy Referral Rates Alongside Rising Opioid Prescription Rates in Patients With Low Back Pain in the United States 1997–2010

What Can We Do About It?

The dogs on Main Street howl 'Cause they understand
If I could take one moment into my hands
Mister I ain't a boy, no I'm a man
And I believe in a promised land
Nijs J, Roussel N, Paul van Wilgen C, Koke A, Smeets R. Thinking beyond muscles and joints: therapists’ and patients’ attitudes and beliefs regarding chronic musculoskeletal pain are key to applying effective treatment. Man Ther. Apr 2013;18(2):96-102. ispaininstitute.com

Pain is produced by the brain...

Altering information the brain receives can potentially alter threat and thus the pain experience.

Fear

- **Definition:** A distressing negative sensation experience induced by a perceived threat
- **Fear-Avoidance Beliefs Questionnaire**
- **Tampa Scale of Kinesiophobia**
- **Clinical...**


Catastrophization

- **Inability to foresee anything other than the worst possible outcome**, however unlikely, or experiencing a situation as unbearable or impossible when it is just uncomfortable
- **Pain Catastrophization Scale**


Impaired beliefs...

- **Pain is always bad**
- **All pain must be gone before engaging in normal activity and movement (and therapy)**
- **Passive treatment is the answer**
- **Pain will increase with any/all activity**
- **Work is potentially harmful**


The efficacy of pain neuroscience education on musculoskeletal pain: A systematic review of the literature

The results of this updated **systematic review** of PNE for MSK pain provides strong evidence for PNE

PNE: Content

- Neurophysiology of pain
- Minimal to no reference to anatomical or patho-anatomical models
- No discussion of emotional or behavioral aspects in relation to pain
- Nociception and nociceptive pathways
- Neurones
- Synapses
- Action potential
- Spinal inhibition and facilitation
- Peripheral sensitization
- Central sensitization
- Plasticity of the nervous system

PNE Evidence

For chronic low back pain, the numbers needed to treat (NNT) and PNE:

- Function 2:1
- Pain 3:1


NNT for Opioids?

<table>
<thead>
<tr>
<th>TABLE 10</th>
<th>NNT</th>
<th>NNH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opioids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphine</td>
<td>2.6</td>
<td>NS</td>
</tr>
<tr>
<td>Codeine</td>
<td>2.6</td>
<td>NS</td>
</tr>
<tr>
<td>Tramadol</td>
<td>3.9</td>
<td>9.0</td>
</tr>
<tr>
<td><strong>Average combined opioids</strong></td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

*In trigeminal neuralgia. NS Nonsignificant. Data from reference 51
Pain and Behavioral Shift: "Despite The Pain..."


The Latest in Pain Sciences
A Modern Approach to Treating Pain

Everybody’s got a hungry heart
Everybody’s got a hungry heart
Lay down your money and you play your part
Everybody’s got a hungry heart

The Neuroscience of Pain

“Pain” fibers and “Pain” nerves...

- Eyes: Contain light receptors; not vision
- Ears: Contain vibration receptors; not hearing
- Tissues: Contain nociceptive receptors; not pain
- Tissues: Contain danger receptors; not pain

Nociceptive or Danger fibers

Pain and Injury is not synonymous...

- Biologically coded
- Environmentally sculpted
- Changes occur in minutes...


The WHOLE brain is involved in Pain...

Amyg – amygdala  
BG - basal ganglia  
HT – hypothalamus  
M1 - primary motor cortex  
PAG - periaqueductal grey  
ACC - anterior cingulate cortex  
PCC - posterior cingulate cortex  
PF - prefrontal cortex  
PPC - posterior parietal complex  
SMA - supplementary motor area  
PB - parabrachial nucleus (dorsolateral pons)  
Si and SII - somatosensory cortical areas


Environment influences pain...

- STRESS


Cortisol
- (Hydrocortisone)
- Adrenal cortex

**Cortisol**

- **Brain**
  - Memory
  - Sleep
  - Concentration
  - Blood pressure
  - Reproduction
  - Other

- **Immune**
  - Cytokine signaling
    - IL – 1
    - IL – 6
    - TNF- \( \alpha \)
  - Increased nerve sensitivity
  - Persistent inflammation
  - Brain plasticity

---

**The Clinical Application for PNE**

**Fighting Opioids with Patient Empowerment**

Comes on up for the rising
Comes on up, lay your hands in mine
Comes on up for the rising
Comes on up for the rising tonight

---

**The “Rules” when considering PNE**

- Screen accordingly
  - Red Flags
- Use outcome measures
- Thorough interview
- Thorough “low tech” examination
Interview...peeling layers

Beyond the basics:
- What do you think is going on with your back?
- What do you think should be done for your back?
- Why do you think you still hurt?
- What would it take for you to get better?
- Where do you see yourself in 3 years in regards to your back?


Starting “the pain talk”
- Has anyone explained to you why you hurt?
- Would you like to know why your pain is not getting better?
- Before we start some of the “physical” treatment, I’d like to explain to you a little more about your pain


Physical Examination

- THOROUGH
- More “low tech” than high tech
  — Large, functional, physiological
- Neuro
  — Neurodynamic tests (active > passive)
  — Nerve palpation
  — Pressure algometry
  — Two Point Discrimination

Why did my nerves not calm down?


How do we turn down the alarm system?


**Chronic LBP**

- Widespread pain
- Non-responsive to treatment
- Various providers
- Spreading pain
- Increasing pain

**Why this approach for her?**

**Central Sensitization**


**After an interview, physical examination and pain neuroscience education**


In all but one of these studies did patients have statistically significant (p<0.05) decrease in pain ratings

The other group: NONE

A six mile run stimulates endorphin release that is equivalent to 10mg of morphine

There are thresholds for both the intensity (>50% Vo(2)max) and duration (>10 min) of exercise required to elicit exercise analgesia
It does not take much...

- Start with 3-5 minutes
- 50% max heart rate
- Add 1-2 minutes every other day
- Goal: 30 minutes

Goal Setting

Most patients:
- No goals
- Poorly defined goals

You have to have a reason to get out of bed


Goal Setting/Pacing/Graded Exposure

One approach does not have the answer

One profession alone does not have the answer

Side Effects of Physical Therapy?
I’ll finish with the MOST IMPORTANT slide of the program...

Louis Gifford

Patients want to know...
1. What is wrong with me?
2. How long will it take?
3. What can I (the patient) do for it?
4. What can you (the clinician) do for it?
5. How much will it cost? (I added this one)

For more information:
www.ispinstitute.com
www.evidenceinmotion.com
info@ispinstitute.com
1-866-235-4289