



# **Hypnosis for Chronic Pain Management: New Findings for Clinical Efficacy**

**Mark P. Jensen, Ph.D.**

University of Washington, Seattle, WA, USA

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# Overview

- A small taste of the effects of suggestion
- Three clinical studies supporting the efficacy of hypnosis analgesia
- Imaging studies supporting the efficacy of hypnotic analgesia
- Implications of the findings for the treatment of chronic pain

## Themes/hypotheses underlying program

- Peripheral activity may trigger pain, but *it is the brain that creates the experience of pain*
- Treatments that impact brain can produce relief

# A taste of suggestion

- Imagine a taste
- Heavy hand
- Participation not mandatory

# What happened

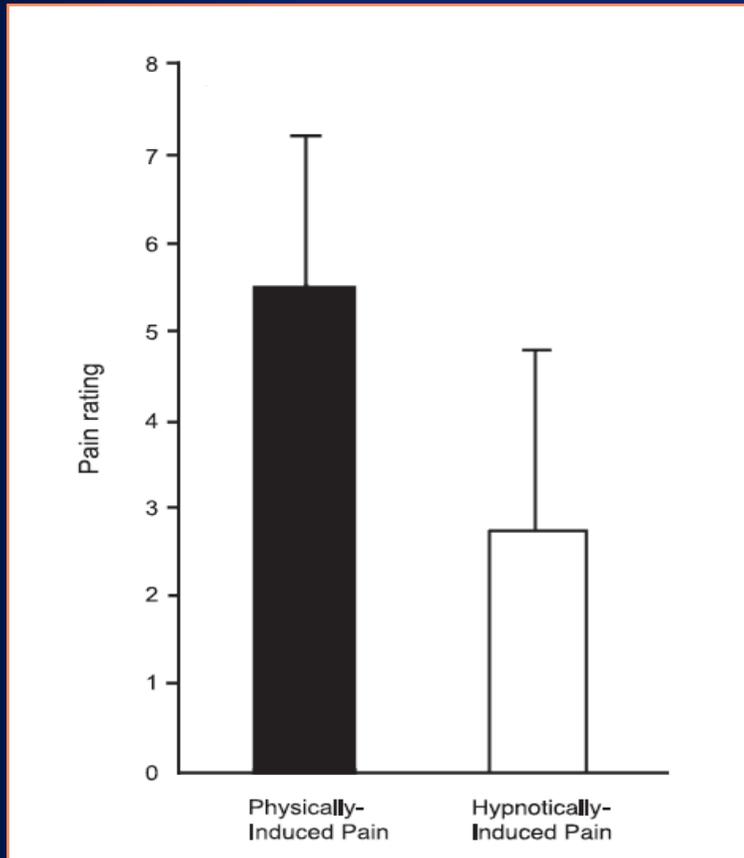
- Effects are “real”
- Effects are variable
- What happened with brain activity?

# Hypnotic pain

## Derbyshire et al., 2004

- Can one use hypnosis to induce pain?
- Does “hypnotic pain” differ from “imagined pain” and “real” pain?
- Intensity and cortical activity in response to painful heat, hypnotic pain, & “imagined pain”.

# Hypnotic pain

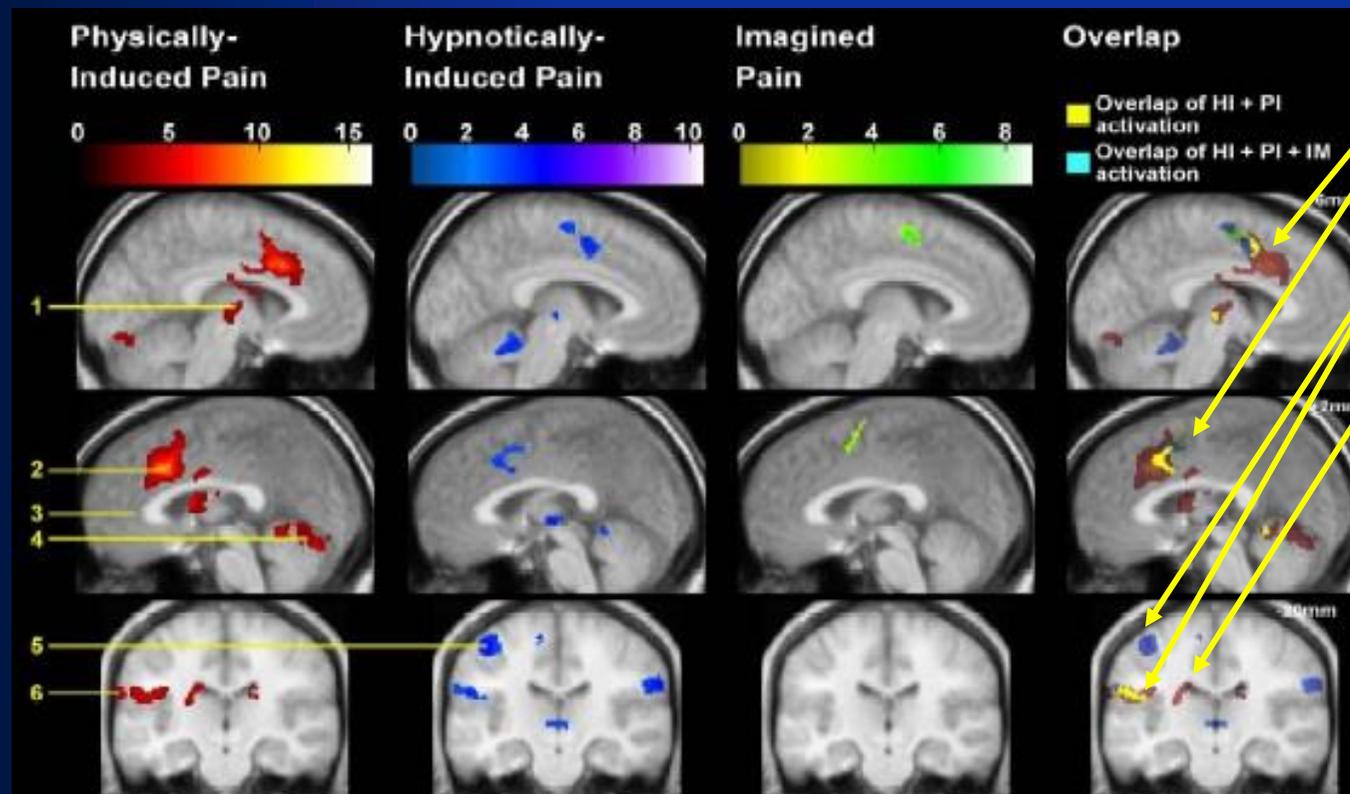


Effect on pain experience:

- Stimulation: 5.7/10 (3-10)
- Hypnotic pain: 2.8/10 (1-9)
- Imagined pain: 0/10 (0)
- Response to stimulation and hypnosis was variable

# Hypnotic pain

Derbyshire et al. (2004). Cerebral activation during hypnotically induced and imagined pain. *Neuroimage*, 23, 392-401.



ACC

Sensory Cor.

Insula

The evidence indicates that...

- Brain is final common pathway to experience
- Hypnosis can enhance ability to alter experience

# The problem of chronic pain

## Chronic pain is common:

- Chronic pain of all types: 15% - 20%  
(Blyth et al., 2001; Sjogren et al. 2008; Verhaak et al., 1998)
- Chronic widespread pain: 5% - 7%  
(Gerdle et al., 2008)
- Neuropathic pain: 3% - 8% (Gustorff et al., 2008)

# The problem of chronic pain

## In individuals with disabilities:

- SCI: 77-79% pain, ~ 33% severe pain
- MS: 53-83% pain; 10-20% severe pain
- Amputation: 70-85% phantom pain, 74% residual limb pain, 51-71% back pain; 32% severe pain
- CP: 67-84% pain; 31% severe pain

# The problem of chronic pain

Chronic pain is, by definition, refractory:

Analgesics most common (Schappert, 1998)

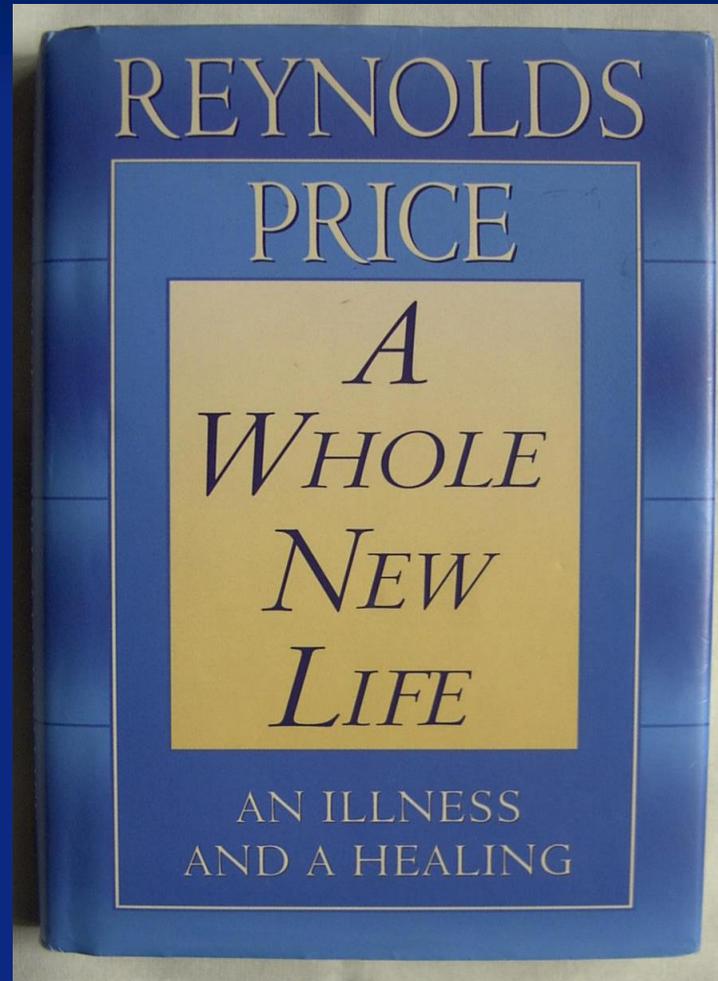
Analgesics do not eliminate pain (Turk, 2002)

- Average pain reduction for opioids: 32%  
(Turk, 2002)

- Meds for neuropathic pain 30%-40%  
response rate (McQuay et al., 1996)

→ *There is a need to develop new effective interventions*

# Maybe hypnosis?



# Initial case series

Funded by the PVA in 1995

Provide four patients with SCI self-hypnosis training and write a research proposal

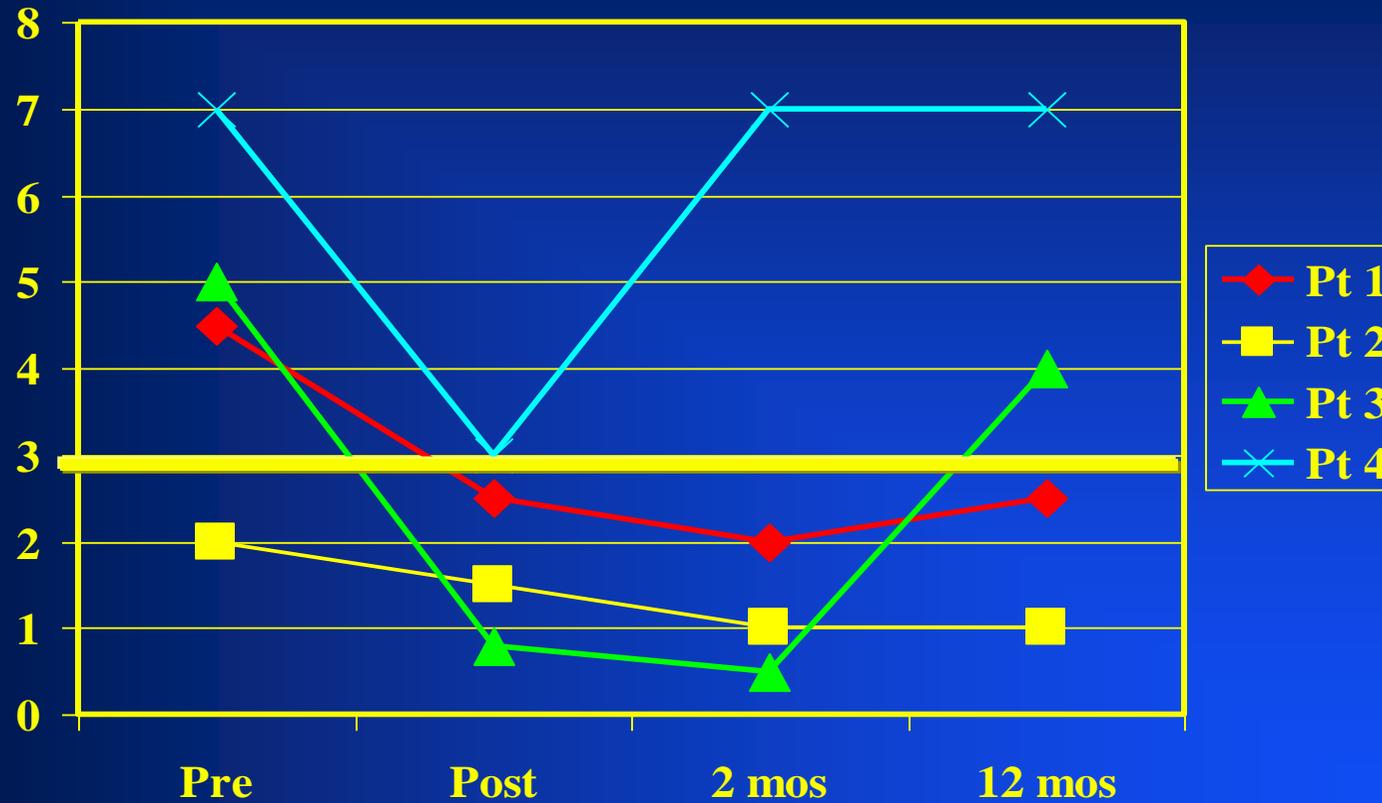
All four reported initial improvement

Three maintained or built on gains by 2 mos; one patient's pain returned to pre-treatment levels at 2 months

At 12 months, two continued to maintain gains, while the third reported increases in pain.

Responders: 2/4 (50%)

# Initial case series



~ Jensen & Barber, 2000

# Clinical trial

RCT of Self-Hypnosis Training versus EMG-biofeedback for SCI-related chronic pain

Funded by NIH, NICHD, NCMRR

Questions:

- What percent of patients benefit?
- Do benefits last beyond the sessions?
- Is self-hypnosis training more effective than a viable alternative treatment?

# Procedures

N = **37** patients with SCI and chronic pain assigned to hypnosis (HYP) or EMG-assisted relaxation (BIO).

10 sessions of treatment

Outcome assessed before and after treatment, and at 3-month follow-up

# Study participants

Mean age = 49.5 yrs (Range, 19 – 70)

76% males, 24% females

95% Caucasian, 5% Native American

45% Neuropathic pain; 55%

Nonneuropathic pain

28 (76%) completed treatment (5 HYP and  
4 BIO dropouts)

# Primary outcome measure

## Usual pain intensity

- Rating of average (past 24 hours) intensity on 0-10 scale four times in 7 days.
- At pre-baseline, post-baseline, post-treatment, and 3-month follow-up.
- 4 ratings averaged into single score, range from 0-10.
- Assessed by phone by blind RA.

# Secondary outcome measures

Current pain intensity before and after session: 0 – 10

Numerical Rating Scale (NRS).

Frequency and effects of practice (for those in HYP):

Number of days of practice and relief on a 0-10 NRS.

# Self-Hypnosis training intervention

**Induction**: variant of Barber's Rapid Induction

Analgesia.

**"Special Place" imagery**: A safe and comfortable place.

**Decreased unpleasantness**: "You can experience being less and less bothered by any sensations..."

**Diminished pain**: "Any sensations are becoming less and less clear, getting smaller and smaller..."

**Imagined anesthesia**: "Picture any areas of discomfort being engulfed and infused with a powerful psychological anesthesia..."

# Self-Hypnosis training intervention

**Sensory substitution**: “Notice feelings like numbness or warmth in areas that used to be uncomfortable...”

**Deep relaxation**: “Imagine your right hand becoming more and more relaxed, heavier and heavier...”

**Post-hypnotic suggestions**: Self-hypnosis: “Any time you’d like to feel more comfortable, take a deep, satisfying breath...” Extension of effects: “Benefit will stay with you...become a part of who you are...”

**Practice**: Given practice tape, and encouraged to practice at least daily.

# EMG-Assisted Biofeedback

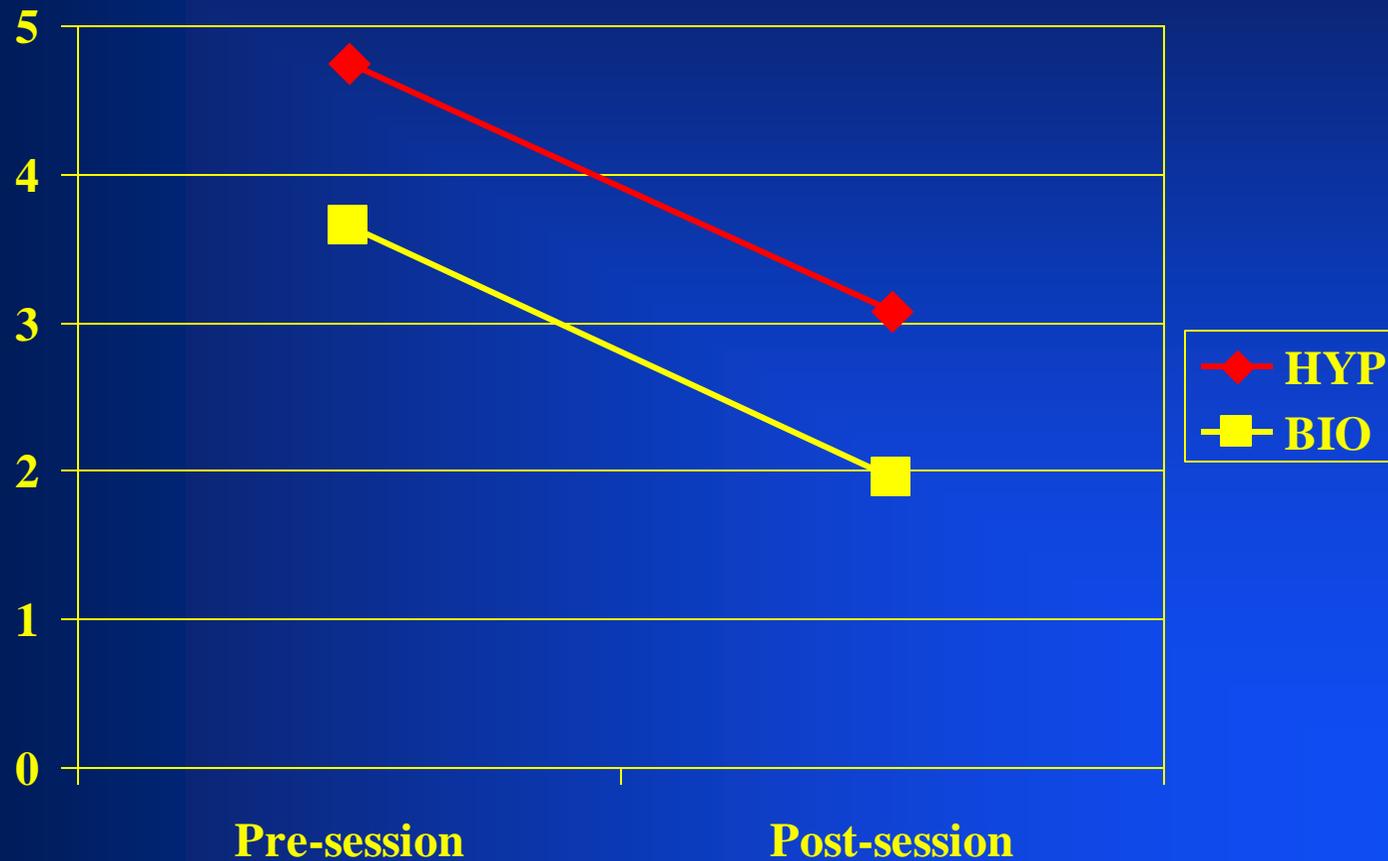
Frontalis EMG-biofeedback to reduce frontalis activity.

Patients given a relaxation audio recording

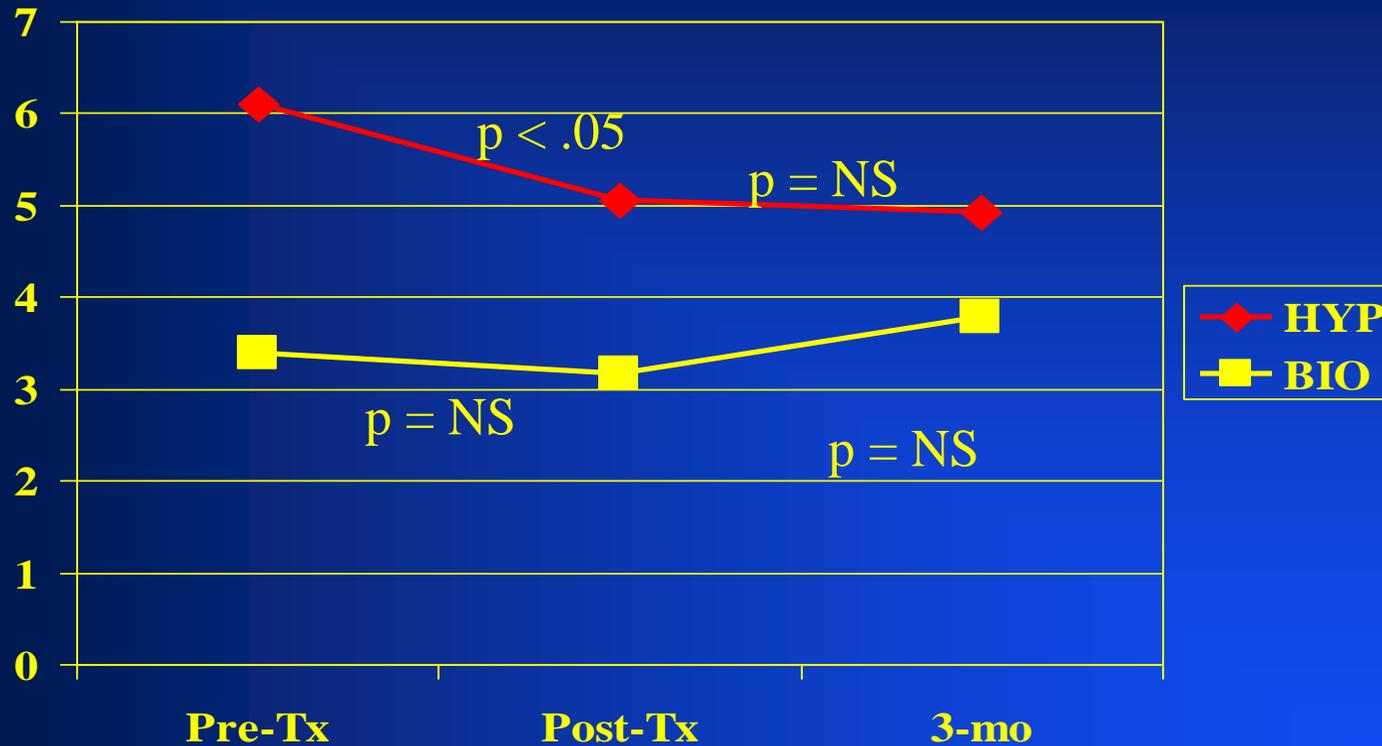
Both treatments described as

“Interventions that contain both relaxation and hypnosis components that have been shown to reduce pain in other populations”

# Results: Pre- to post-session pain



# Results: Usual pain intensity



Responders: 22% HYP; 10% BIO

# Results: Practice frequency and effects

Of the HYP participants @ 3 -mo:

60% still listened to the audio recording  
(Range, 2-25 days)

80% used skills w/o recording (range, 2-30  
days)

Average relief w/ recording: 3.58; w/o: 3.44

Average hours of relief w/ recording: 3.07;  
w/o: 1.42

# Conclusions

Both HYP and BIO have a similar immediate (substantial) effect on pain intensity

HYP more effective than BIO for daily average pain

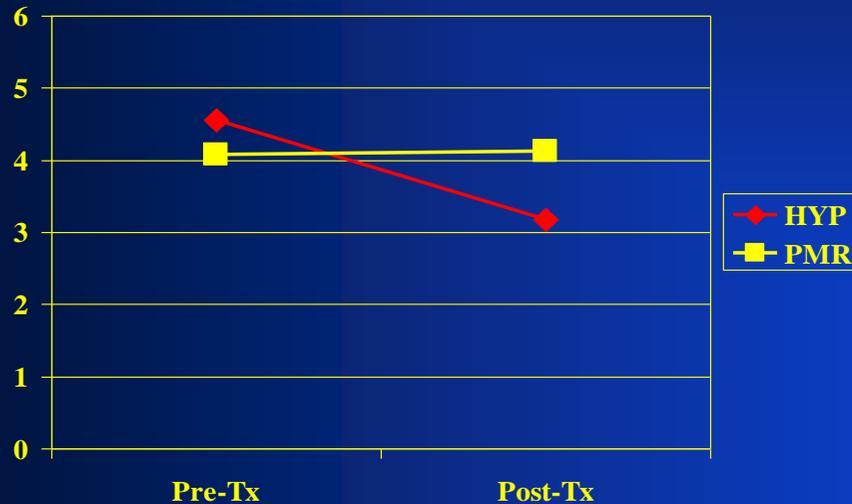
Decreases in usual daily pain with HYP maintain for at least 3 months

Treatment outcome is variable: Not all benefit

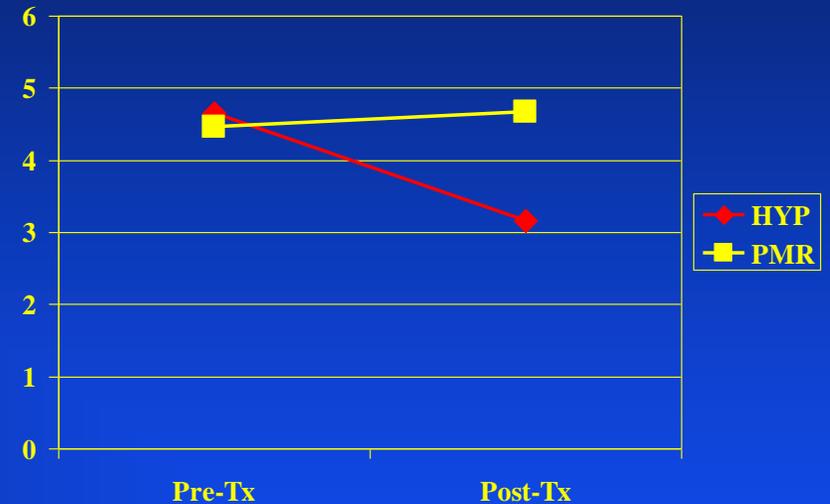
But, 80% continue to use skills taught at 3 months, and report pain relief that lasts 1.5 – 3.5 hours

# MS trial (HYP vs. PMR; N = 22)

## Pain Intensity



## Pain Interference



Responders: 47% HYP; 14% PMR

# “Side effects” of hypnotic analgesia

Asked 30 patients who had received the HYP protocol about the “other effects” of treatment:

- 40 effects listed
- 9 (23%) pain-related benefits
- 23 (58%) nonpain-related benefits
- 5 (13%) ‘neutral’ effects
- 3 (8%) ‘negative’ effects

# Pain-related benefits

Pain reduction (40%)

Increased control over pain (40%)

“I have a new tool for managing pain” (30%)

## Nonpain-related benefits

General positive comments (e.g.,  
“It helped”, “I liked it”): 37%

Increased well-being: 33%

Increased relaxation: 23%

Decreased stress: 17%

## Negative effects

“It did not work” (3%)

“It was not as effective as I hoped it would be” (3%)

“The effects did not last as long as I hoped they would” (3%)

# Imagine a Drug That...

- Produces a substantial ↓ in pain in 22% (SCI) to 47% (MS) of patients w/ chronic refractory pain
- Whose “side effects” are mostly positive, and include ↑’d sense of well-being and relaxation
- Whose worst side effects are: has no effect (3%), not as effective as hoped (3%), or benefits do not last as long as hoped (3%)
- That continues to be effective (no tolerance) and that most patients (80%) continue to use...

# Reviews of Randomized Trials

Findings are consistent with those of other clinical trials published in the past 20 years

All of the reviews of these trials have the same general

**conclusions** (Elkins et al., 2007; Montgomery et al., 2000; Jensen & Patterson, 2005; Patterson & Jensen, 2003)

- Hypnotic analgesia is more effective than no treatment and some biomedical treatments (PT, medications)
- Hypnotic analgesia has specific effects over and above placebo (expectancy) effects
- Response to hypnotic treatment is *variable*

# Recent study

To compare the effects of three interventions,

- Self-hypnosis training (HYP)
- Cognitive restructuring (CR)
- “Hypnotic Cognitive Restructuring”

Relative to an education control condition,

On two primary outcomes:

- Average pain intensity
- Catastrophizing cognitions

In a sample of individuals with MS and pain

# Study Rationale

- Hypnotic interventions effectively alter pain *intensity*
- Cognitive restructuring targets pain-related *cognitions* (e.g., catastrophizing)
- Hypnosis enhances the effects of CBT treatments
- Might HYP-CR contribute to benefits over and above HYP and CR?

# Study questions

Hypothesize that training in self-hypnosis  
→ less pain; what effects on  
catastrophizing?

Hypothesize that CR → less  
catastrophizing; what effects on pain?

Are there any benefits of HYP-CR (on pain  
and/or catastrophizing) over and above  
those obtained by HYP and CR alone?

# Study design

Within subjects treatment comparison

Four sessions each of ED, HYP, CR, HYP-CR (or ED, CR, HYP, HYP-CR; 16 sessions total)

# Treatments

ED: Education control (info about pain)

CR: Cognitive restructuring: identify, eliminate, and replace negative cognitions

HYP: Hypnotic induction, suggestions for ↓pain and suffering, ↑ ability to ignore pain, post-suggestions for permanent effects

HYP-CR: (1) tolerance of ambiguity; (2) hope and positive expectancies; (3) general cognitive flexibility; and (4) replacement of faulty cognitions with more adaptive ones

# Participants

22 enrolled, 15 completed

Diagnosis: MS

Inclusion:  $\geq 18$  yrs, pain  $> 6$  mos,  
average pain  $\geq 4/10$

Desc: 80% female,  $\bar{X}$  age = 52.6  
yrs (Range, 41-65 yrs)

# Measures

## *Pain Intensity:*

- 0-10 NRS before and after sessions;
- Average Pain Intensity between treatment modules

## *Catastrophizing: Pain Catastrophizing Scale*

Secondary outcomes: *Worst pain intensity* (0-10), *Pain Interference* (BPI)

# Results

Current pain intensity ratings obtained before and after each session

Treatment	Pre-session	Post-session
Module	Mean (SD)	Mean (SD)
Education Control	3.84 <sup>a</sup> (1.51)	3.68 <sup>a</sup> (1.64)
Hypnosis	3.33 <sup>a</sup> (1.86)	1.77 <sup>b</sup> (1.79)
Cognitive Therapy	3.49 <sup>a</sup> (1.89)	3.29 <sup>a</sup> (1.92)
HYP-CR	3.04 <sup>a</sup> (2.16)	1.60 <sup>b</sup> (1.70)

Note: Means with different superscripts are significantly ( $p = .001$ ) different from one another

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# Results

Means of outcome measures at baseline and after each treatment module

Outcome Variable	Pre-Tx	Post-ED	Post-CT	Post-HYP	Post-HYP-CT	F for Time
<u>Primary outcome variables</u>						
Average pain	4.87 <sup>a</sup>	4.81 <sup>a</sup>	4.49 <sup>ab</sup>	3.96 <sup>b</sup>	3.29 <sup>c</sup>	5.79* (4,10)
Catastrophiz	1.11 <sup>a</sup>	0.92 <sup>ab</sup>	0.70 <sup>bcd</sup>	0.84 <sup>bc</sup>	0.55 <sup>d</sup>	3.47† (4,10)
<u>Secondary outcome variables</u>						
Worst pain	6.46 <sup>a</sup>	6.20 <sup>ab</sup>	5.63 <sup>bc</sup>	5.43 <sup>c</sup>	4.44 <sup>d</sup>	6.34** (4,10)
Pain interfer.	4.08 <sup>ab</sup>	4.34 <sup>a</sup>	3.82 <sup>b</sup>	3.71 <sup>bc</sup>	2.99 <sup>c</sup>	2.06 (4,10)

†p = .05; \*p < .05; \*\*p < .01

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# Summary and Implications

4 sessions of hypnotic analgesia treatment effectively reduces average daily pain

4 sessions of CT may reduce catastrophizing

A combined HYP-CT intervention appears to have benefits over and above either HYP or CT alone.

→ *Clinicians who want to maximize beneficial outcomes...*

# Summary and Implications

4 sessions of hypnotic analgesia treatment effectively reduces average daily pain

4 sessions of CT may reduce catastrophizing

A combined HYP-CT intervention appears to have benefits over and above either HYP or CT alone.

→ ...*should incorporate CT into HYP treatments, and HYP into CT treatments.*

# Imagery evidence

Rainville et al. (1997). Pain affect encoded in human anterior cingulate but not somatosensory cortex. *Science*, 277, 968-971.

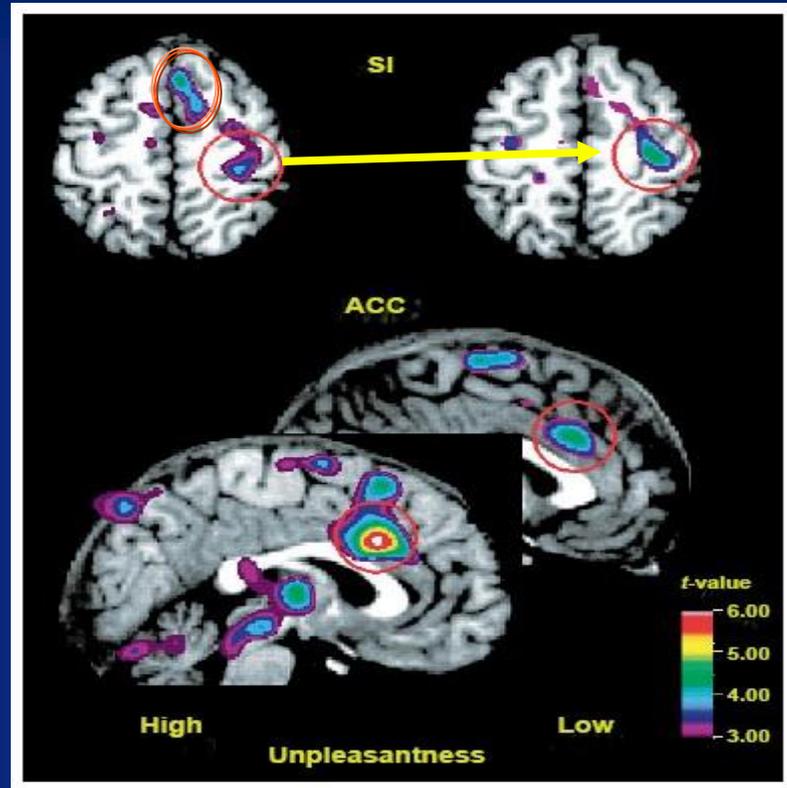
Painful heat stimulation in alert and hypnosis conditions resulted in CBF increases in:

- Sensory cortex 1 [S1] and 2 [S2]; and
- Anterior cingulate gyrus [ACC].

Hypnotic suggestions for increased or decreased *unpleasantness* altered

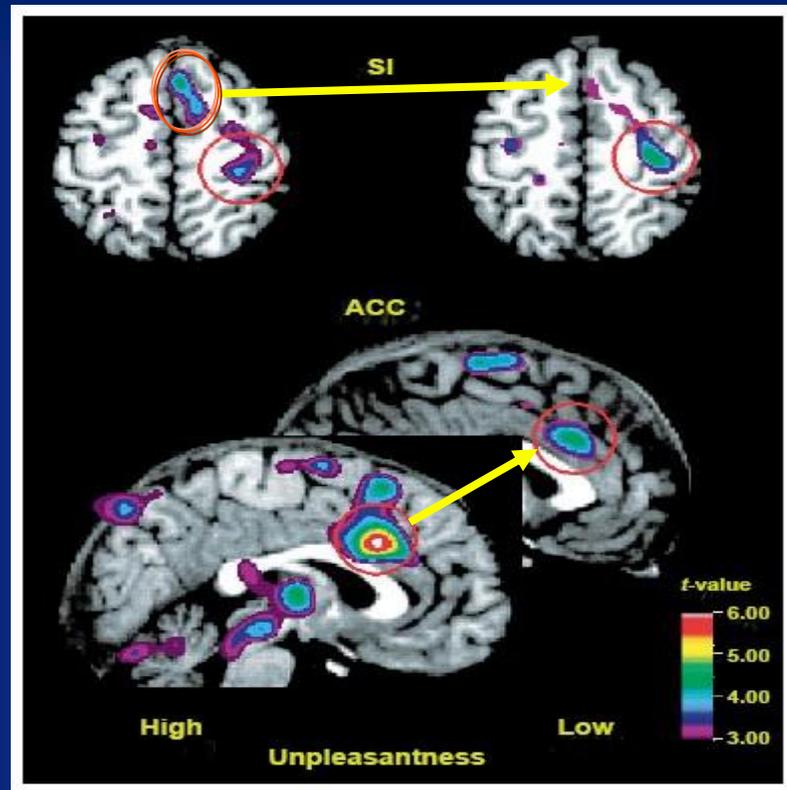
- Perception of pain affect (81/100 → 45/100); and
- activation in ACC only

# Imagery evidence



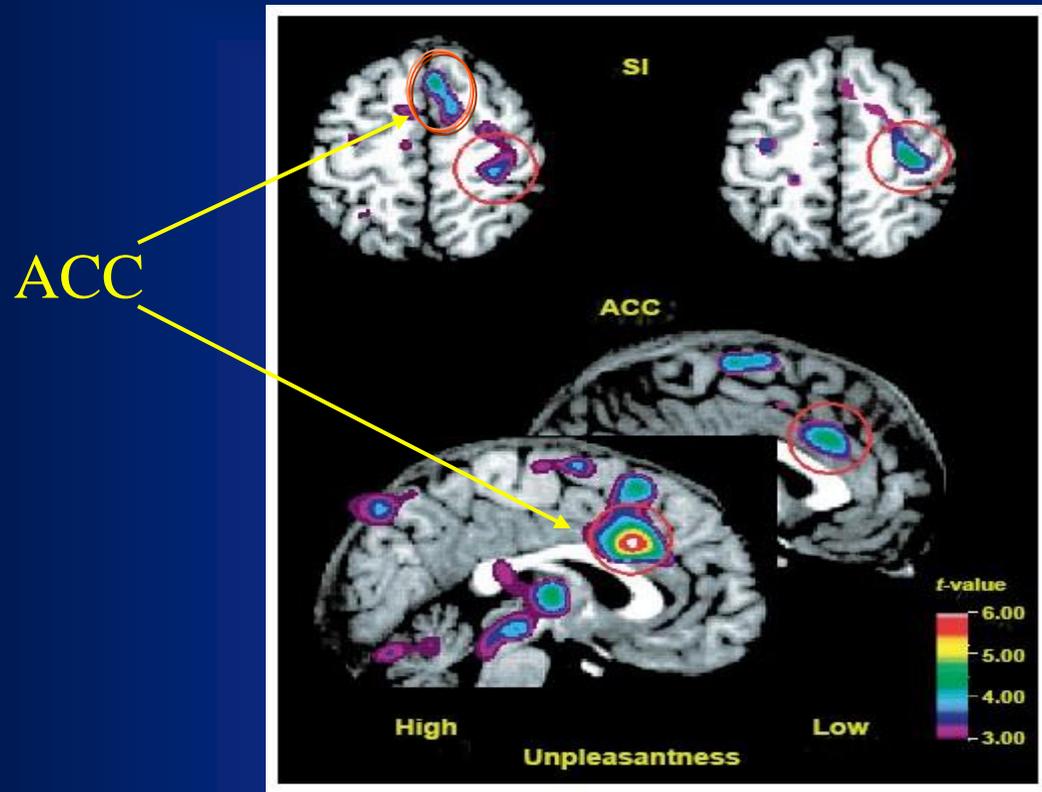
→ No difference in activity in sensory cortex

# Imagery evidence



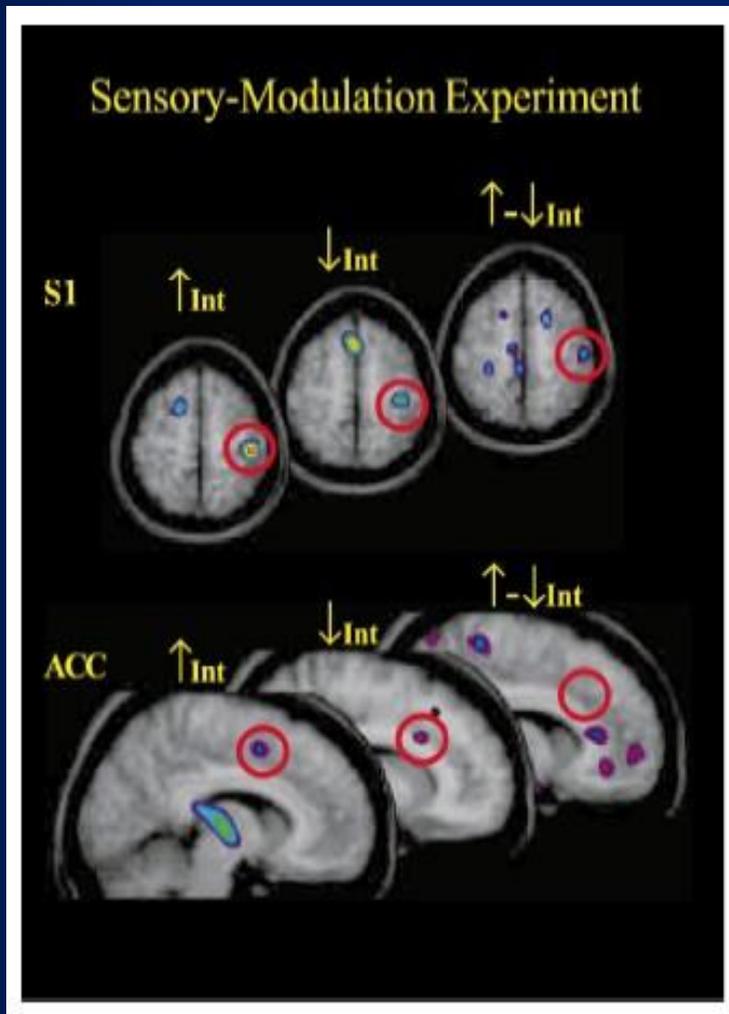
→ Large difference in activity in ACC

# Imagery evidence



→ The ACC responds to suggestions for changes in pain unpleasantness.

# Imagery evidence



Hypnotic suggestions for increased or decreased pain intensity altered perception of pain intensity (70/100 → 33/100) and activation in *sensory* cortex but *not* ACC.

~ Hofbauer et al., 2001

# Summary and Conclusions

Hypnotic analgesia treatment effective reduces average daily pain, on average.

Effects of hypnotic analgesia treatment is *variable*; some benefit more than others

Self-hypnosis continues to be used by the great majority of patients who learn it.

# Summary and Conclusions

Hypnotic analgesia treatment has many “side effects” ... that are overwhelmingly positive.

Hypnosis appears to “boost” the efficacy of cognitive therapy

(Hypnotic analgesia treatment is easy to learn and to provide).



Carl Laemmle . . . . . presents

# DRACULA

The VAMPIRE THRILLER

**TOD BROWNING**  
Production  
with  
**BELA LUGOSI**  
**DAVID MANNERS**  
**HELEN CHANDLER**  
**DWIGHT FRYE** & Edward Van Sloan  
from the famous novel & play by Bram Stoker  
produced by Carl Laemmle Jr.

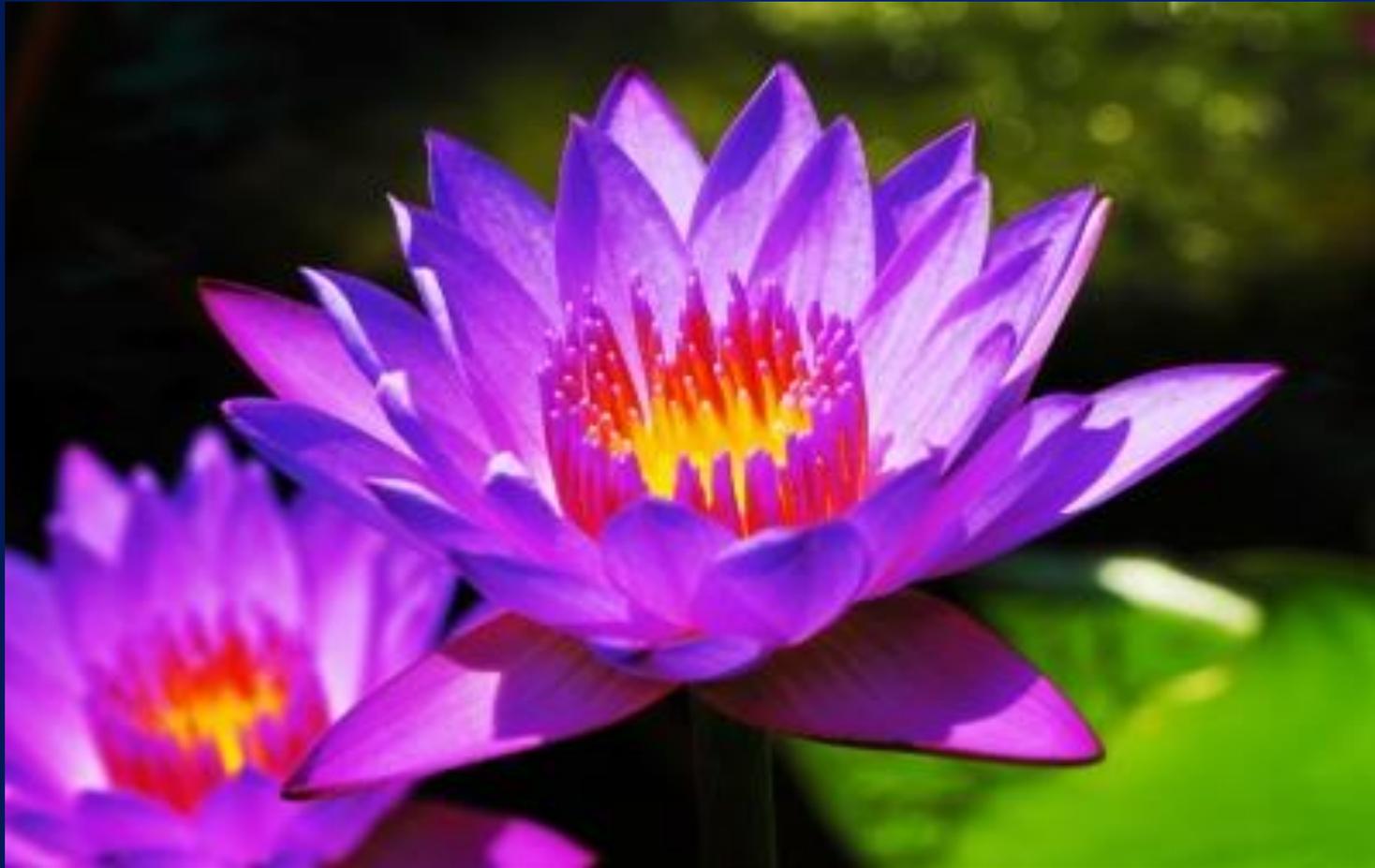
A UNIVERSAL Picture







# Thank You!



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