

Understanding How Patients and Caregivers Cope with Pain

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Background

Clinical Background

Duke Pain Prevention and Treatment Research Program

- Understanding adjustment to disease-related pain (i.e. arthritis and cancer)
- Identifying psychosocial factors that influence pain adjustment
- Testing psychosocial protocols to reduce pain, disability, and distress
- Developing novel ways to integrate psychosocial pain protocols into medical and surgical treatments



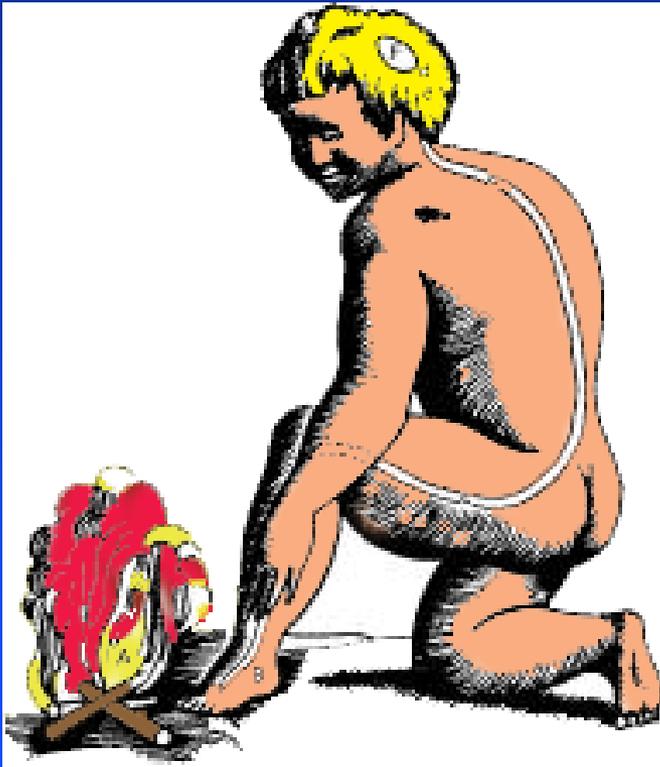
Overview

- 1. Conceptual background
- 2. Empirical studies
- 3. New directions

Conceptual Background

Evolution of Pain Models

The Pain Neuromatrix



17th Century



The Emergence of the Stress and Coping Perspective

Pain as a Stressor : Animal Studies

Stressor
(Pain)



Outcome



Animal Studies of Pain as a Stressor



- Pain produces a reliable biological response
- Response is proportional to pain
- Response to pain is similar to response to other stressors

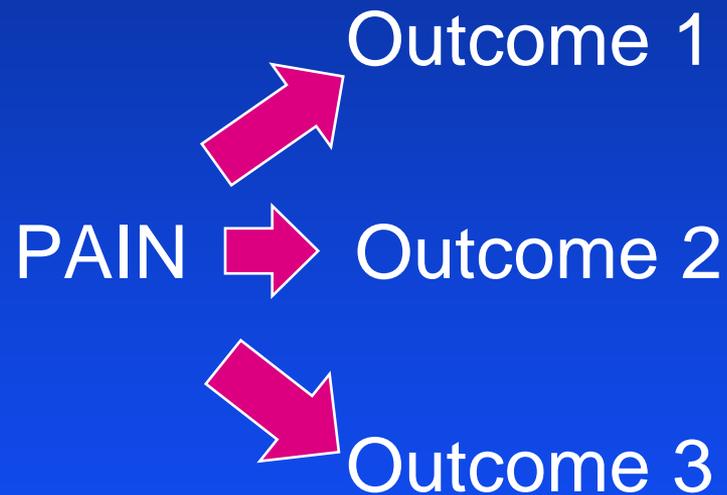
Pain as Stressful Event: Human Studies

Stressful Event (Persistent Pain) → Outcome (e.g. disability, psychological distress)



Human Studies of Pain as a Stressor

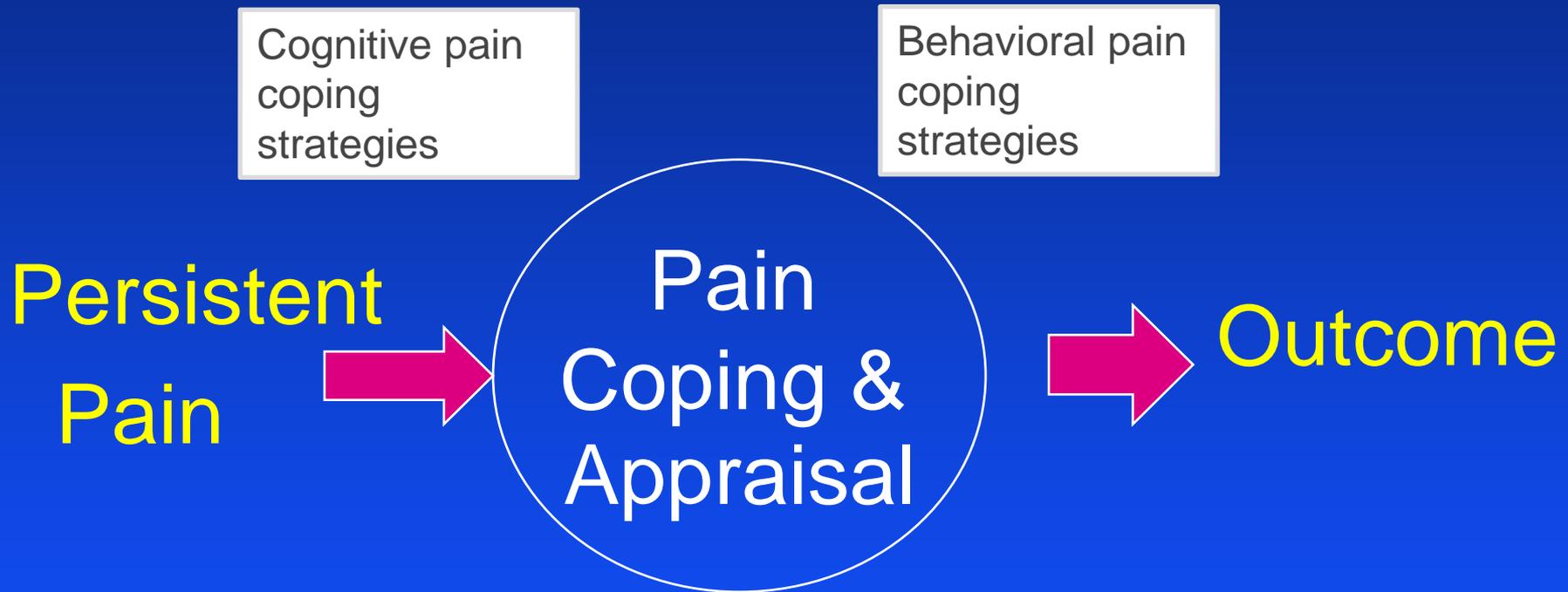
- Pain produces varied responses across different individuals
- Level of pain does not predict degree of response
- Effects of pain can vary over time and settings



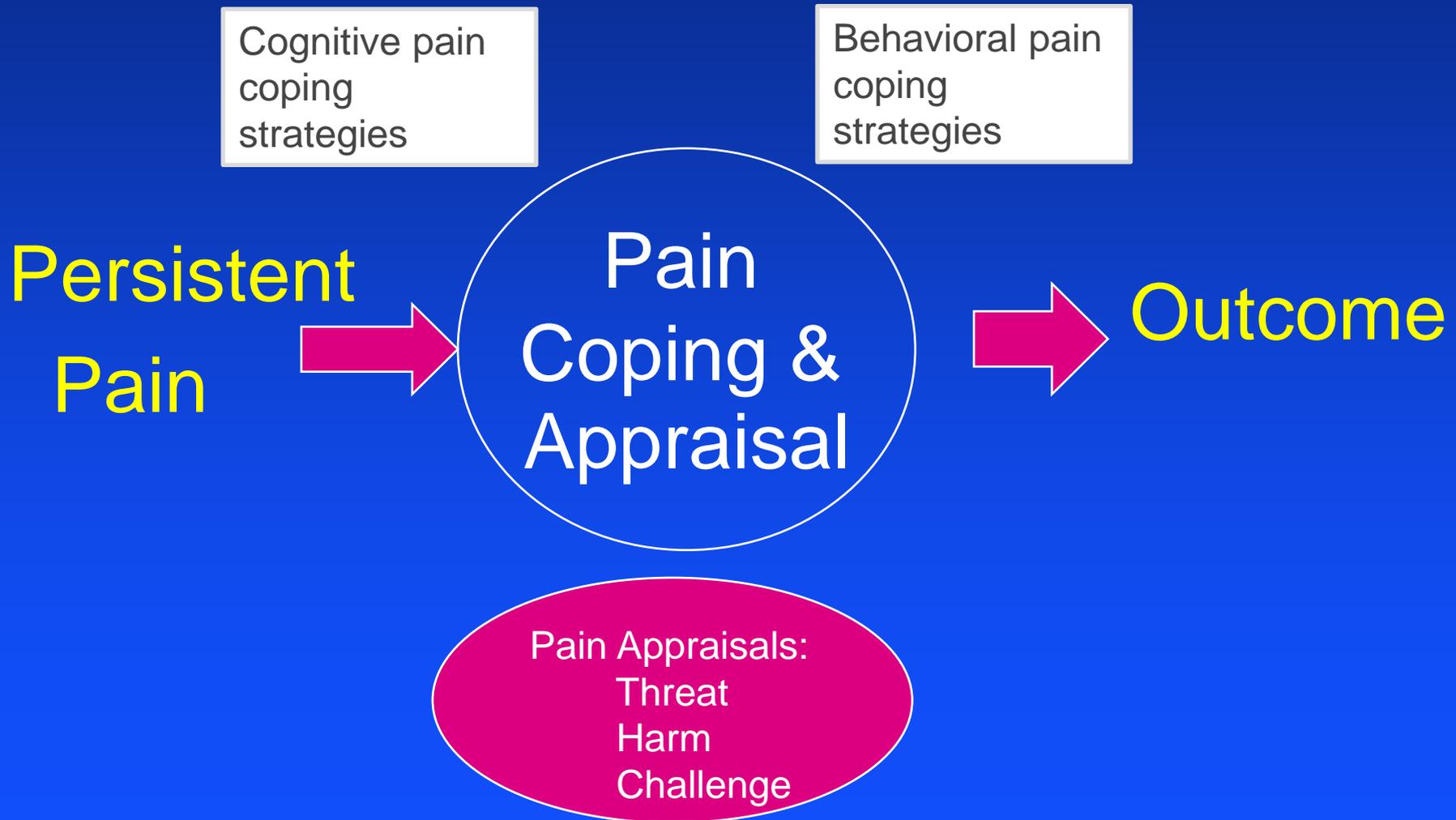
Stress and Coping Theory (Lazarus & Folkman)



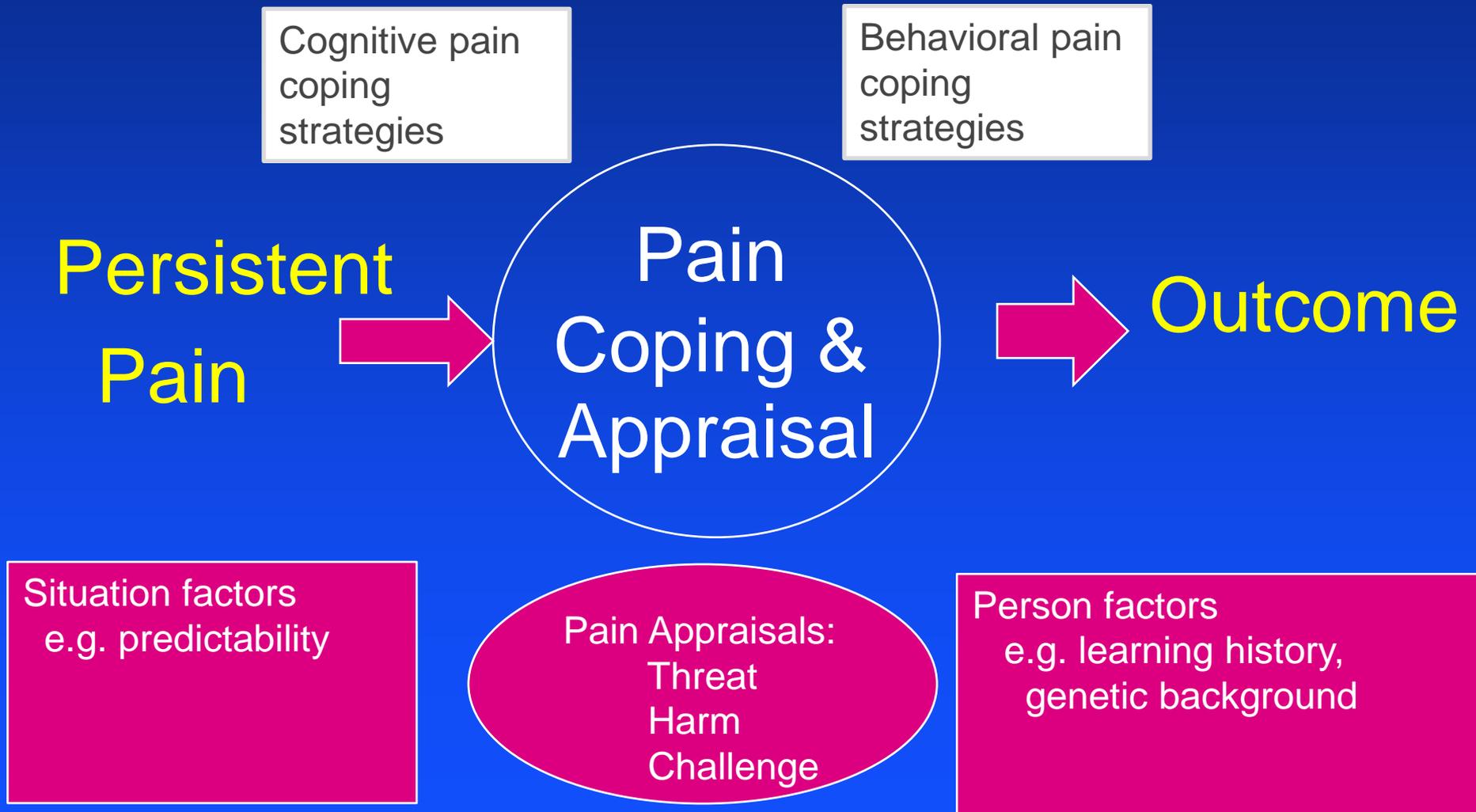
Pain: A Stress and Coping Perspective



Pain: A Stress and Coping Perspective



Pain: A Stress and Coping Perspective



The Social Context of Pain Coping

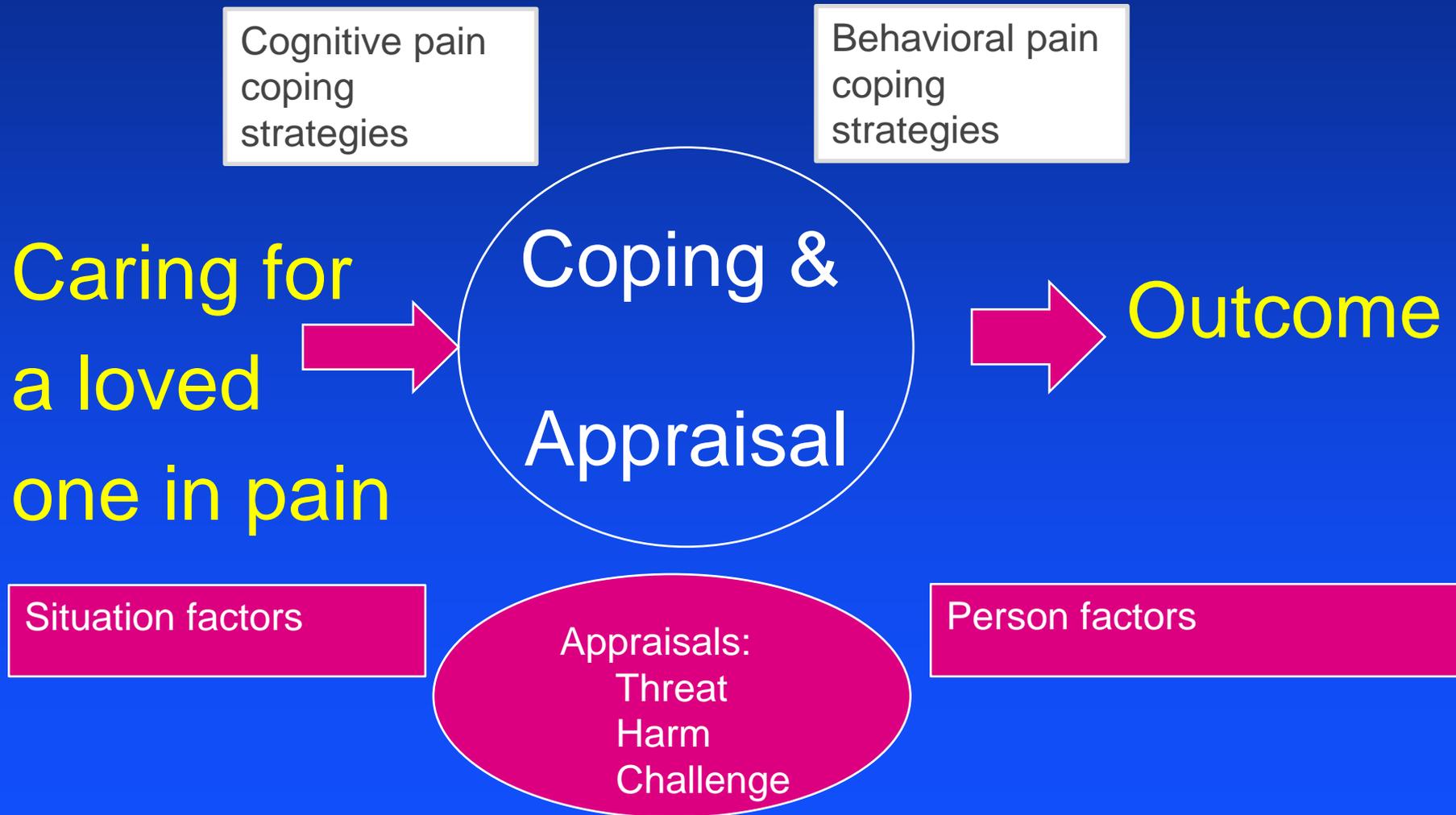
Seeing a loved one in pain



Pain Caregiving: A Stress and Coping Perspective



Pain Caregiving: A Stress and Coping Perspective



Empirical Studies

How do People Cope with Pain?

How Do You Cope with Pain?

“I distract myself”

“I take rest breaks”

“I do things to help myself relax”

“I avoid overly negative thinking”

“I mentally calm myself”

Indices

Cognitive vs behavioral
coping

Active vs passive coping

“The pain is awful and
overwhelms me”

“I know I can do things to control
or deal with it”

“I can’t stand it, I can’t live this
way:

I am going to end up in a
wheelchair”

“It is a challenge but I know I can
deal with it”

“I know I am going to have pain
so I might as well get on with
my life”

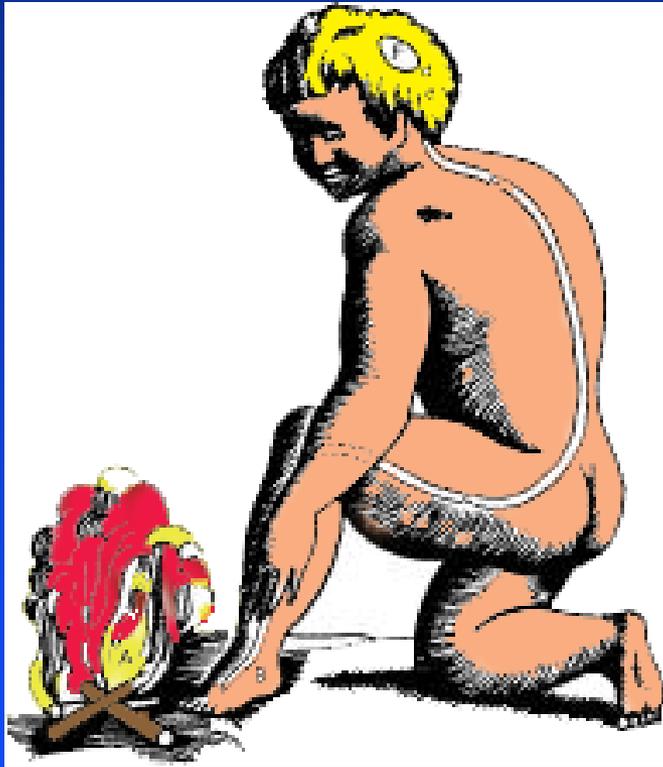
Indices

Self efficacy for pain control

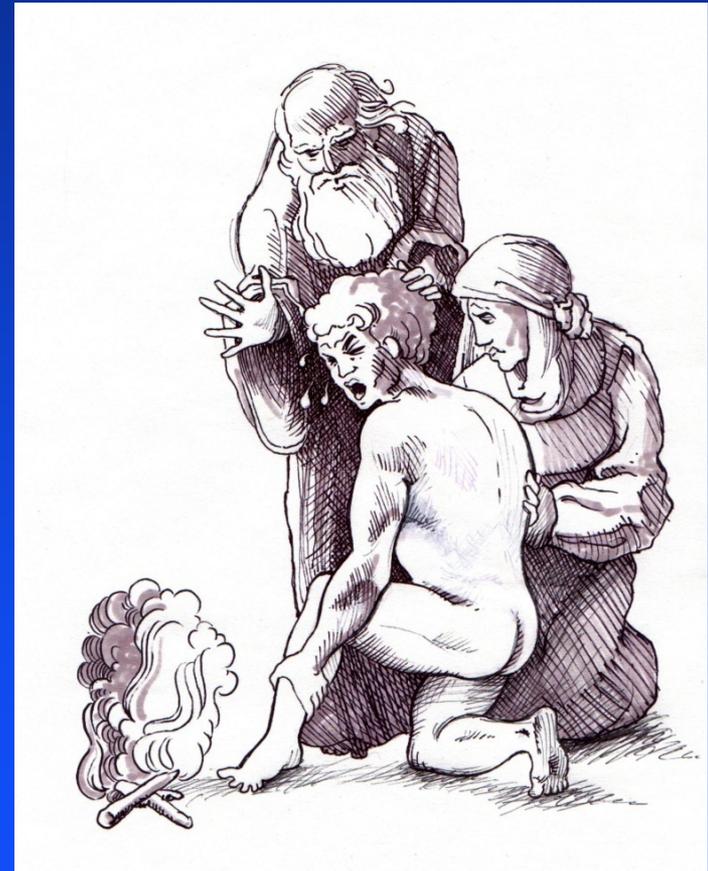
Pain acceptance

Pain catastrophizing

What Is Pain Catastrophizing?



Pain catastrophizing=“the tendency to focus on and exaggerate the threat value of painful stimuli and negatively evaluate one’s own ability to deal with pain”
(Keefe et al., 2000, p.2).



Studies with Chronic Non-Malignant Pain: Persons Who Catastrophize:

- Report more severe pain

Even after controlling for pain:

- Show more pain behavior (e.g. guarded movement)

- Report higher depression, anxiety, psychological distress, more suicidal ideation

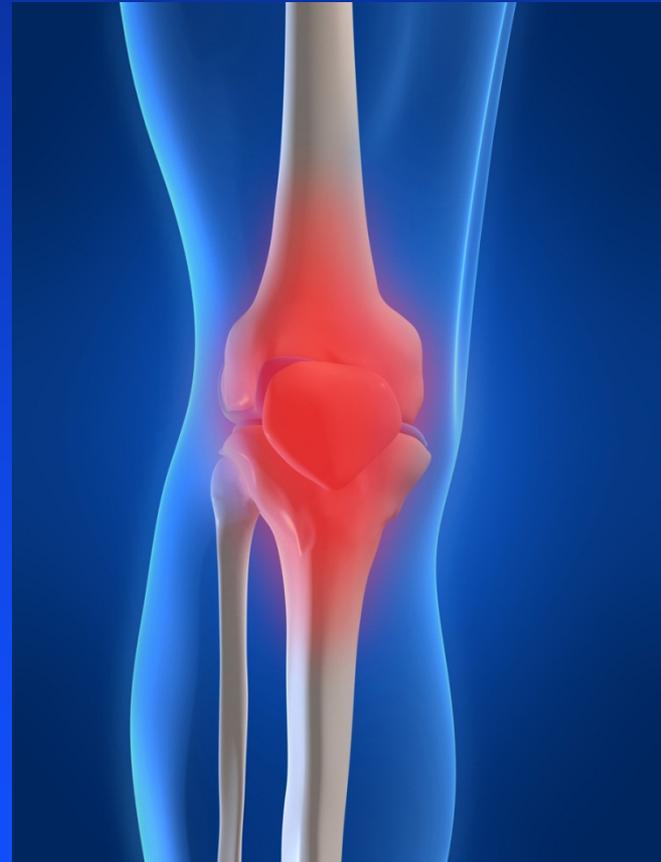
- Exhibit more physical disability

- Have higher intake of pain medication

Does Coping Really Matter?
Pain Catastrophizing
in Osteoarthritis Patients
Undergoing Knee
Replacement

Knee Replacement Surgery for Osteoarthritis

- Pain =primary reason knee replacement
- 30% moderate/severe pain 1 year after surgery
- 40% require assistive device to ambulate



Riddle, et al. (2009)

101 consecutive OA patients pre-op and 6-mos later

Covariates:

- 1) extent of preoperative pain or functional status,
- 2) severe surgical complications,
- 3) implant status,
- 4) comorbidity

Psychological predictors

- Depression
- Anxiety
- pain catastrophizing
- self-efficacy
- fear of movement

Results

- Odds 4.5 times higher that patients with high pain catastrophizing scores were non-responders in terms of clinically significant pain relief.

Next Step

- NIAMS supported multicenter clinical trial (D.Riddle=P.I.)
- Will a coping skills intervention improve the outcomes for knee replacement surgery patients with high pain catastrophizing pre-operatively?

Mechanisms

Cortical Responses to Pain: Relationship to Pain Catastrophizing

- Seminowicz & Davis (2006)
- 22 Healthy individuals
- fMRI
- Electrical stimulation median nerves
 - » Mild pain
 - » Moderate pain

Results

- Pain catastrophizing not related to regions associated with sensory discriminative aspects of pain
- Pain catastrophizing was related to regions associated with affective, attention, and motor aspects of pain
- During more intense pain, activity in prefrontal cortical regions implicated in top down modulation of pain were negatively correlated with pain



Key Findings & Conclusions

- In catastrophizers:
- A cortical vigilance network is engaged during mild pain
- During more intense pain, diminished prefrontal cortical modulation impedes disengaging from and suppressing pain

Myths About Pain Catastrophizing

3 Myths

1. Catastrophizing relevant only in “chronic pain”

Reality: catastrophizing works same in persons with “chronic” as well as disease-related pain

2. Persons who catastrophize always respond to pain in the same way (trait)

Reality: Catastrophizing has a trait component, but also a state component: catastrophizing varies day to day just as much as pain

3. People who catastrophize will never respond to treatment

Reality: those prone to catastrophizing often show the best psychosocial treatment outcomes

How Can One Assess Pain Coping and Appraisal?

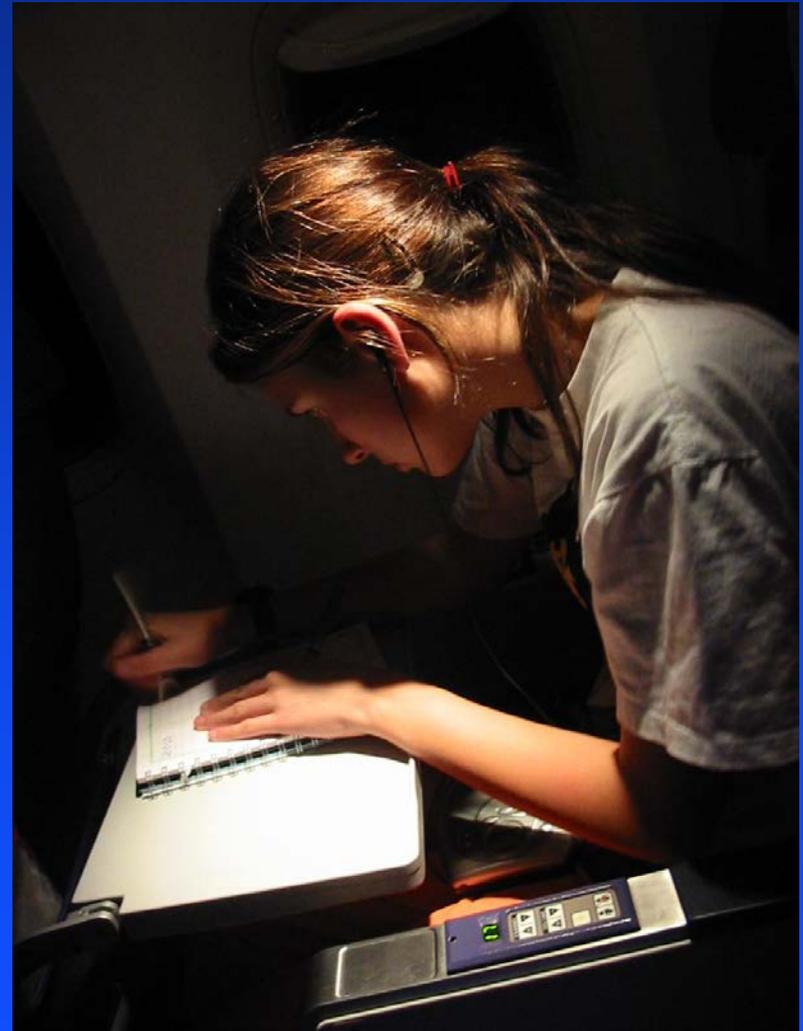
Pain Coping Measures

Questionnaire instruments:

- Coping Strategies Questionnaire (Rosenstiel & Keefe, 1983)
 - » Frequency of use of cognitive and behavior coping strategies
 - » Appraisal of coping efficacy
- Vanderbilt Pain Management Inventory (Brown & Nicassio, 1987)
 - » Active vs passive coping
- Pain Catastrophizing Scale (Sullivan et al., 1995)

Brief Measures of Pain and Pain Coping and Appraisal

- PROMIS= Patient Reported Outcomes Measurement System
- Brief pain intensity, interference, quality measures
- (www.NIHpromis.org)
- Brief coping measures
 - » Jensen, M.P., Keefe, F.J., Lefebvre, J.C., Romano, J.M., & Turner, J.A. (2003) One- and two-item measures of pain beliefs and coping strategies. Pain, 104:453-469.
 - » Tan, G., Nguyen, Q, Cardin, S.A., & Jensen, M.P. (2006) Validating the use of two item pain beliefs and coping strategies for a veteran population. The Journal of Pain, 7, 252-260.



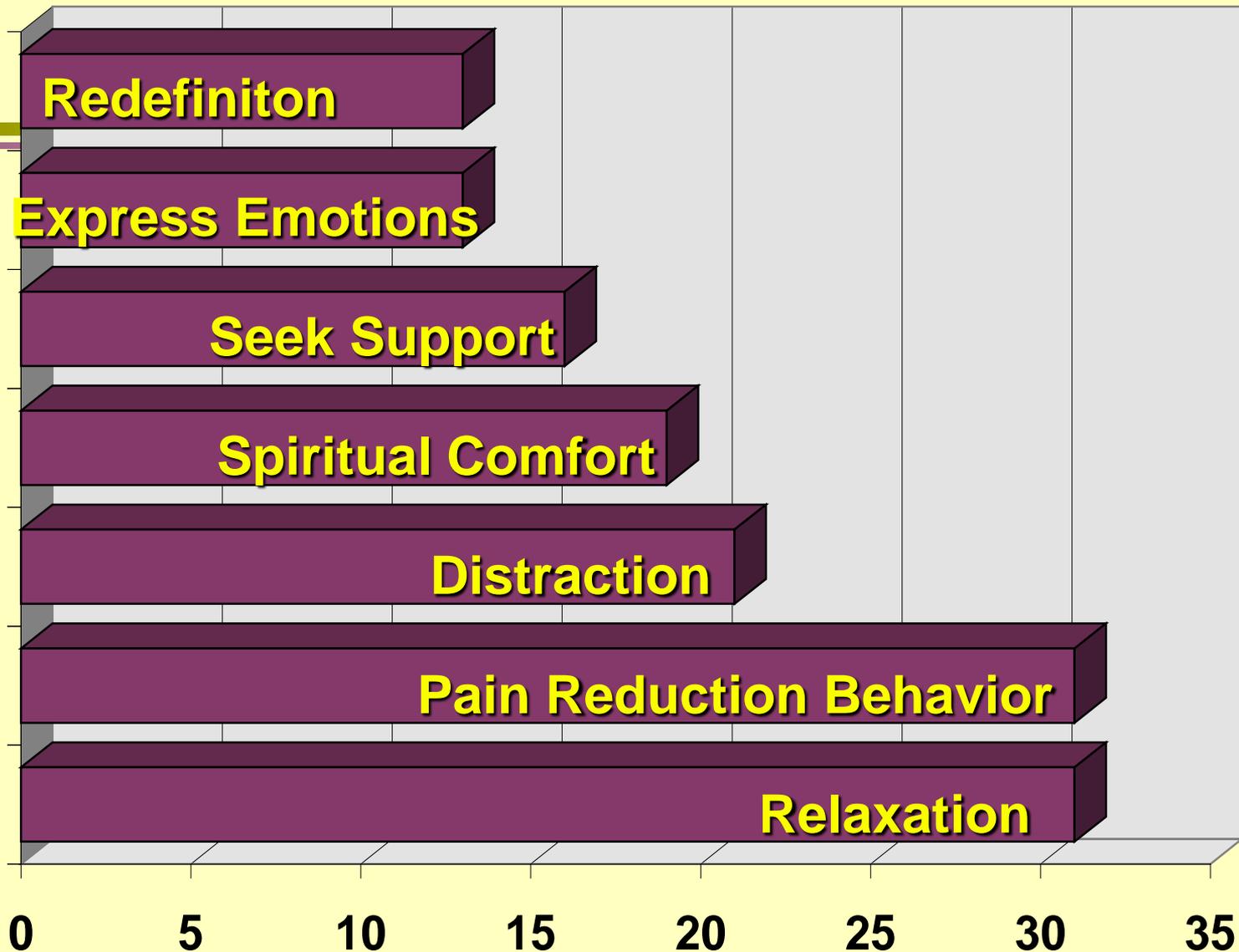
Brief Measures to Study Daily Coping: Advantages

- ❑ Can use in PDAs and tablets
- ❑ Captures pain and coping processes closer to real-time occurrence
- ❑ Avoids retrospection bias
- ❑ Can use sophisticated data analytic methods to analyze relationships between pain and coping
- ❑ Captures dynamics of pain coping and individual differences



Averaging Data: The Usual Approach

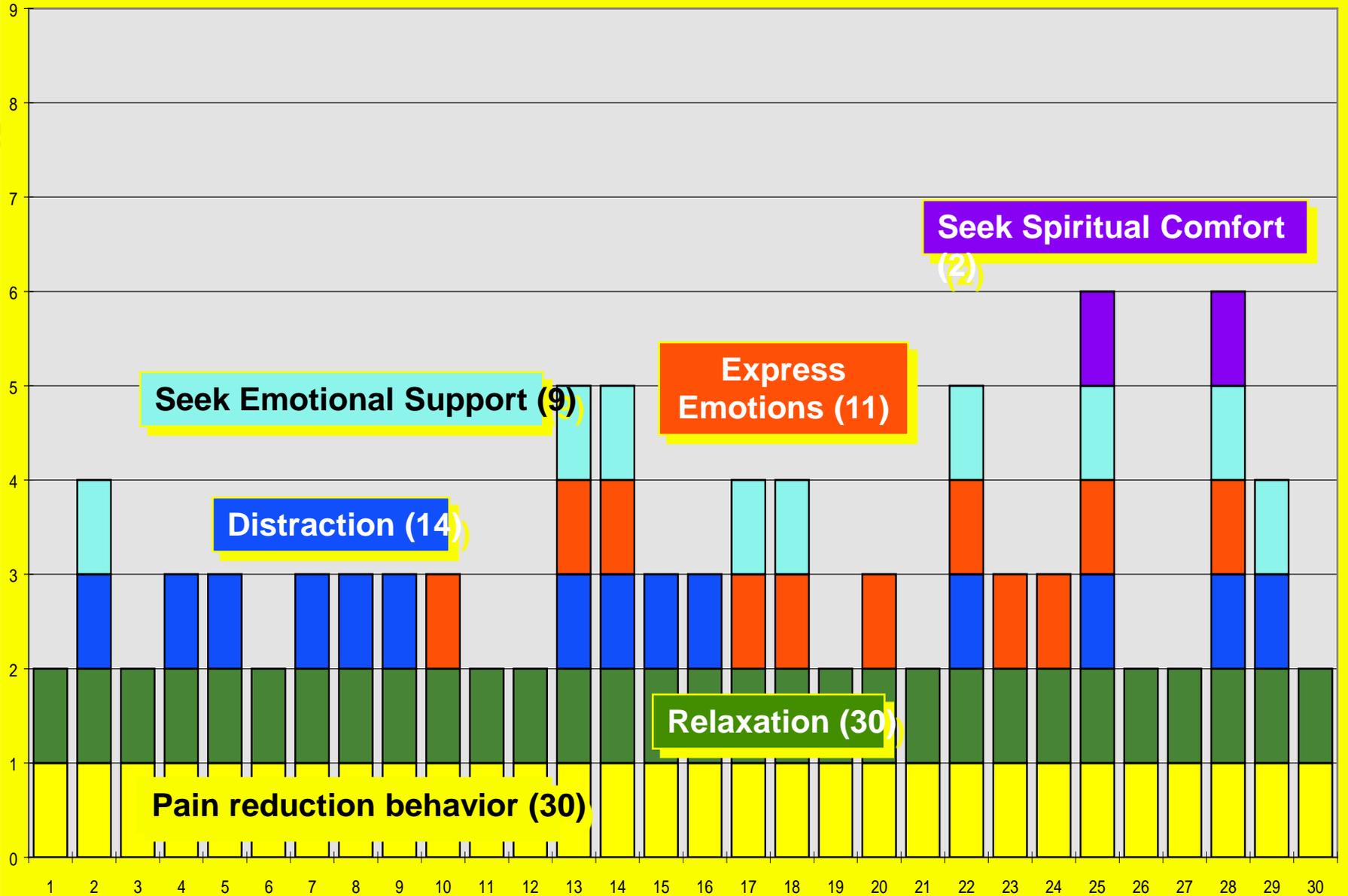
Average of 30 RA Patients Daily Pain Coping Efforts



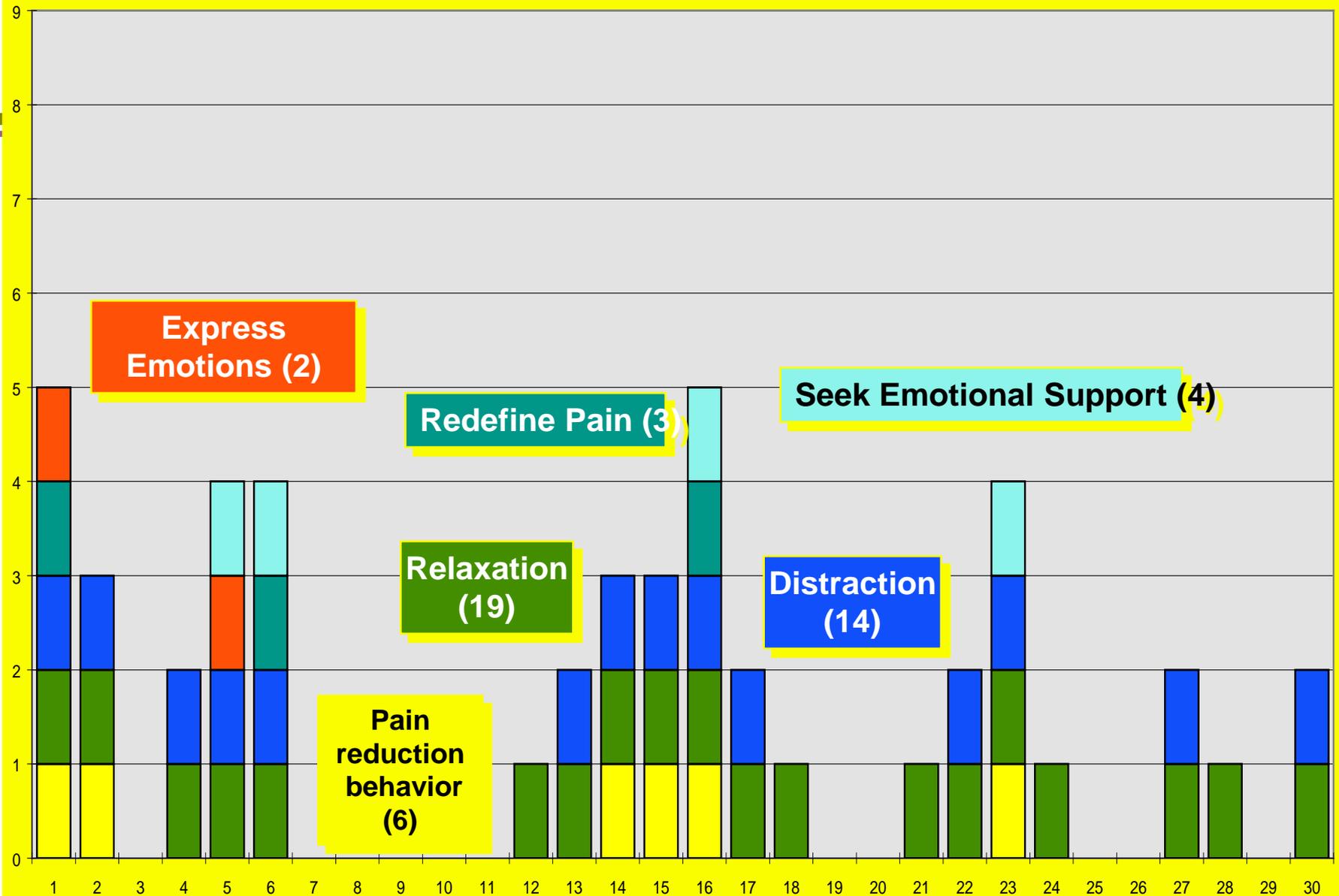
Percentage of Days

Examining Individual Profiles

30 Days of Pain Coping



30 Days of Pain Coping



How Do Significant Others Cope?

Challenges for Partners

- Recognizing pain in your partner
- Discriminating pain and emotion
- Acknowledging pain
- Knowing how one's own emotions influence judgments
- Communicating one's own emotions
- Doing all this while seeing your loved one in pain



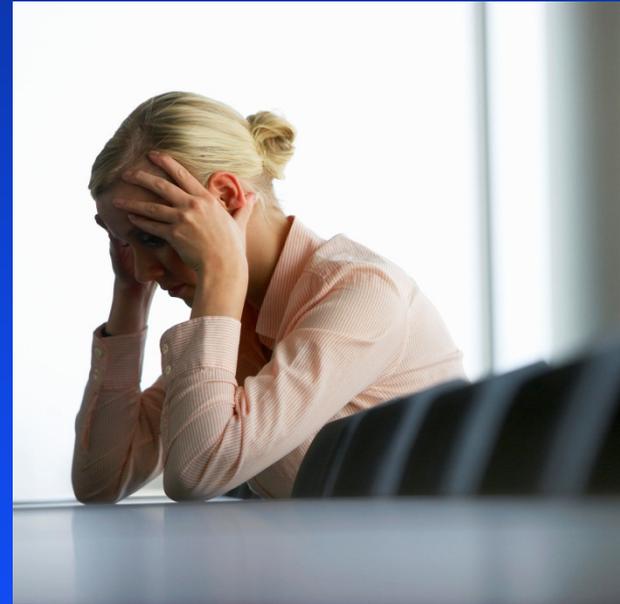
Pain Communication in Couples

Couples Coping with Pain

- N=24 OA patients having OA of the knees, 23 of their spouses.
- Patients and spouses completed two measures
 - holding back
 - self-efficacy for pain communication
- Patients completed measures of pain, physical disability, psychological distress, and pain catastrophizing
- Spouses completed measures of mood and caregiver strain.

Holding Back

- Holding back from discussion of pain and related arthritis concerns.
- 11 domains: pain, other physical symptoms, activity limitations, medical treatments, dissatisfaction with body, negative emotions, fears of disease progression, relationship with partner, relationship with others, financial concerns, and job-related concerns.



Results: Holding Back

Patients who held back from discussing pain and related arthritis concerns



tended to report higher levels of pain ($r=.36$, $p=.08$).

Increased psychological disability ($r=.57$, $p<.01$)
pain catastrophizing ($r=.49$, $p<.05$)

Spouses who held back from disclosing their concerns



reported higher levels of caregiver strain ($r=.44$, $p<.05$)
more negative affect ($r=.44$, $p<.05$).

□ When spouses held back, patients reported



higher levels of pain ($r=.44$, $p<.05$), physical disability ($r=.44$, $p<.05$), psychological distress ($r=.57$, $p<.01$) and pain catastrophizing ($p=.65$, $p<.001$).

Self-Efficacy for Pain Communication



- Patient version
- patient confidence she can communicate their pain to their partner and receiving understanding and effective response
(Cronbach's alpha=.94)

- Spouse version
- spouse confidence he can understand and respond effectively to patient's pain
(Cronbach's alpha=.86).

Results: Self-Efficacy for Pain Communication

Patients with low self-efficacy for pain communication



Had increased pain ($r = -.70$, $p < .0001$)
physical disability ($r = -.63$, $p < .001$)
psychological distress ($r = -.70$, $p < .001$).

□ Partners with low self-efficacy for pain communication



tended to report lower levels of positive affect ($r = .38$, $p = .08$).

Summary

- 1. Patients and spouses vary in their willingness and ability to communicate about pain
- 2. Holding back in particular is related to poor adjustment in both patient and spouse
- 3. We need to explore ways to enhance couples self-efficacy for communicating about pain



Clinical Implications

Clinicians Need to be Aware

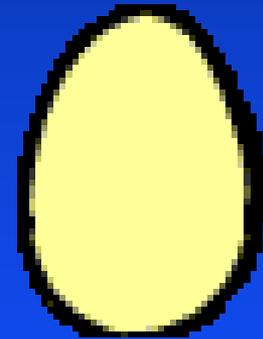
- 1. We can assess pain coping and appraisal reliably
- 2. Pain coping is dynamic
- 3. Brief measures of pain coping can be used to capture day to day changes in coping
- 4. Assessing pain coping can help us understand pain and disability

However, there is a problem
with research discussed so
far....

Who's first?

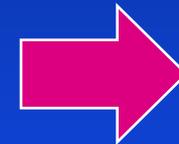
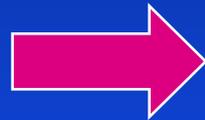


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Intervention Research

Persistent
Pain



Outcome



Psychosocial
Intervention Protocols

Outcome Studies: Basic Design

Example presentations:

Chris Miaskowski, Dawn Ehde, Scott Powers

- Random assignment to psychosocial intervention or control condition(s) (e.g. attention/medication control, standard care)
- Series of intervention sessions
- Comprehensive set of outcome measures pre- and post-treatment

Cognitive-Behavioral Therapy

CBT

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graph TD; CBT[CBT] --> CT[Cognitive Therapy]; CBT --> BT[Behavior Therapy];
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Cognitive Therapy

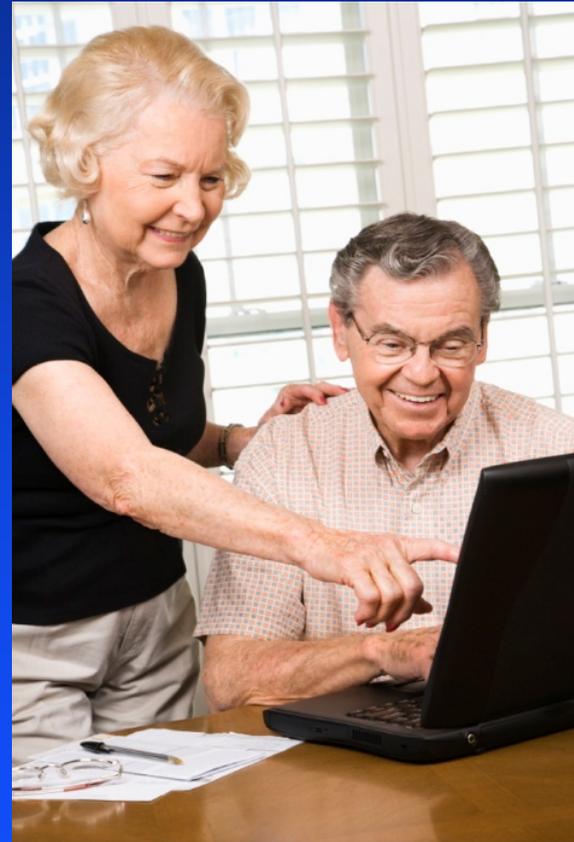
- Active learning of new thought patterns
- Identifying overly negative thoughts
- Challenging them
- Developing new ways of thinking

Behavior Therapy

- Active learning of new behaviors
- Structure learning environment
- Positive reinforcement
- Increasing level and variety of adaptive behaviors

Example of a CBT Protocol: Scott Powers Presentation

- Education about headache management
- Training in pain coping skills (e.g. biofeedback assisted relaxation training, activity pacing, challenging overly negative thoughts, problem solving)
- Parent Coaching & Reinforcement of Coping
- CBT combined with amitryptiline



Evidence of Efficacy

Meta-analyses and Systematic Reviews

- Arthritis pain
- Cancer pain
- Musculoskeletal pain (low back pain)
- Migraine headache
- Tension headache

Key findings

- Significant decreases in pain
- Improvements in indices of adjustment to pain:
 - Depression
 - Anxiety
 - Pain catastrophizing
 - Self efficacy
 - Activity level
 - Medication intake

Interventions Involving Both Patients and Caregivers

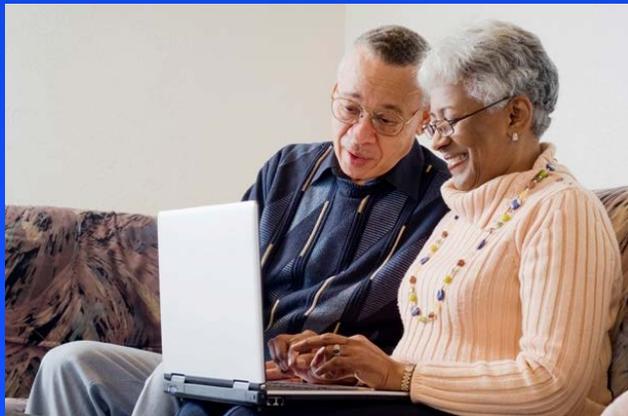


Partner-Assisted

Couples-Based

Interventions Involving Partners: Basic Elements (e.g. C. Miaskowski)

- Partner-Assisted**
- Role of partner: coach/assistant
- Major focus: patient
- Target: patient skills
- Keefe et al. (2004)



- Couples-based**
- Role of partner: equal participant
- Major focus: couple
- Target: couple communication and interaction
- Baucom, et al. (2009)



C. Miaskowski Study

Highlights

- Focus on both patients and caregivers
- Addressed knowledge deficits
- Training in specific skills for effective medication use
- Nurse coaching
- Patient and caregiver pain management occurs in context of managing many other symptoms and demands

New Directions

New Directions



Psychosocial Interventions Delivered by Other Health Care Providers



Telephone-Based Interventions (e.g. Dawn Ehde)



- CBT adapted for delivery by phone
- Can reach patients with mobility problems (e.g. limb loss, SCI, MSO)
- Or who live at a distance
- High patient adherence

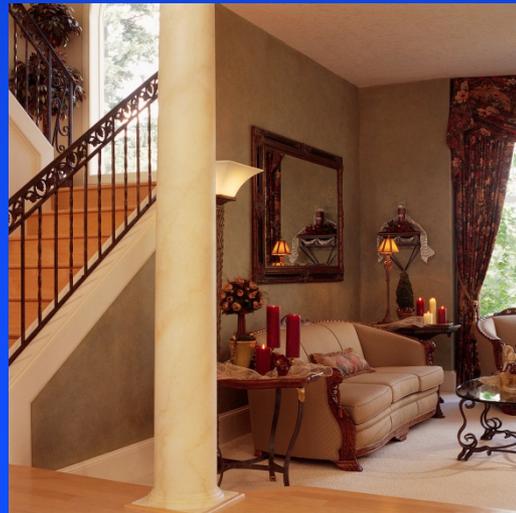
Ways to Deliver Psychosocial Interventions



Video-over
internet



Somers, T.J., Keefe, F.J., & Abernethy, A.A. (2013). Cancer Pain: An electronic system to rapidly identify, assess, and intervene. Annual meeting of the Society of Behavioral Medicine.



Ways to Deliver Psychosocial Interventions



Video-over
internet



Virtual Reality
(VR)



Mobile VR for Pain Management: Home-based VR by Smartphone

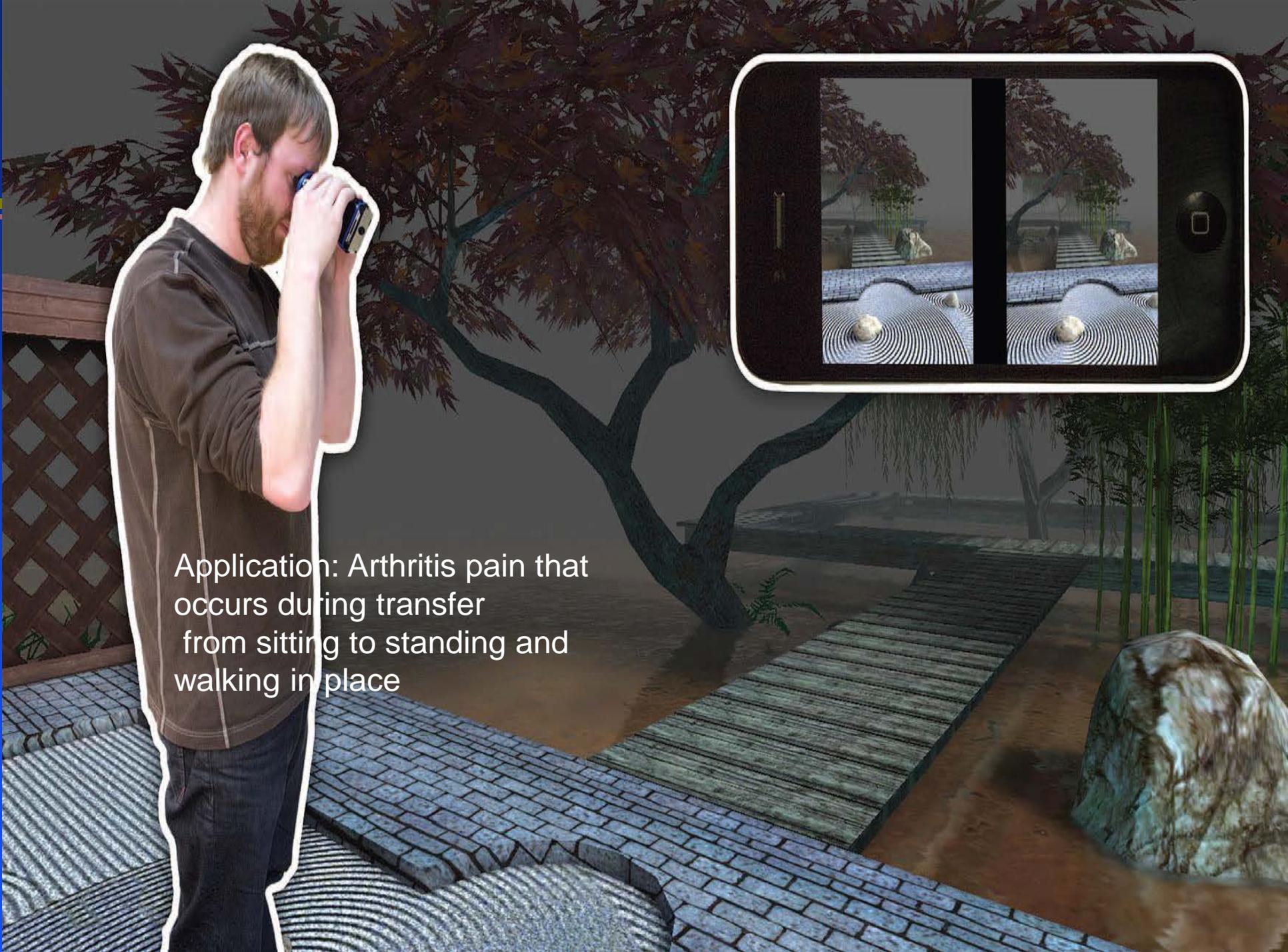


Daniel Keefe
Asst. Prof.
Computer Science
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U. Minn.

- 1. To enhance generalization of lab VR
- 2. To enhance other behavioral interventions (e.g. imagery, meditation)
- 3. For patients who generally have difficulty disengaging from pain
- 4. For situations where pain is particularly challenging

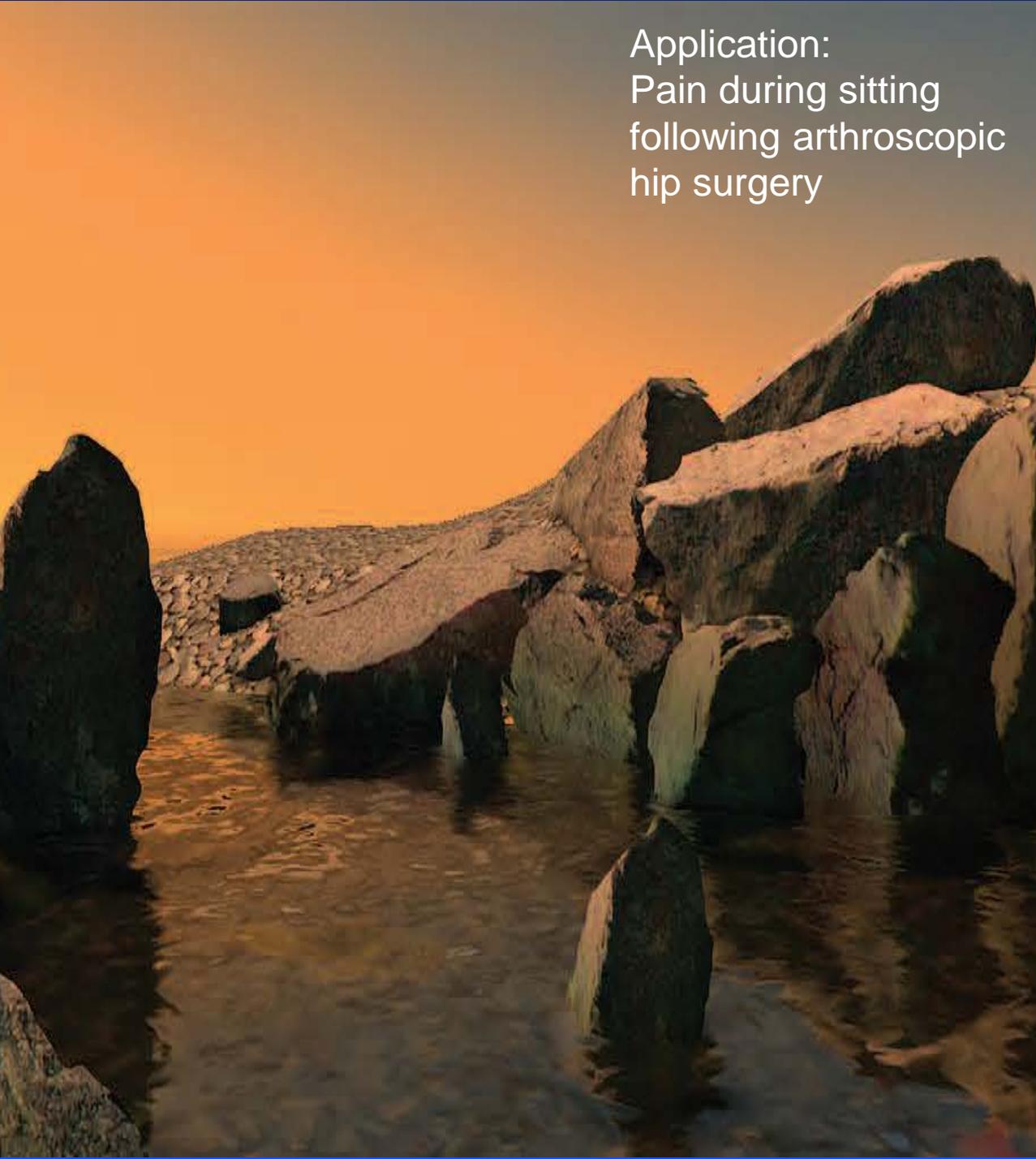
Keefe, F.J., Huling, D.A., Coggins, M.J., Keefe, D.F., Rosenthal Z. M., Herr, N.R., Hoffman, H.G. (2012) Virtual reality for persistent pain: A new direction for behavioral pain management. *Pain*. 153(11): 2163-6. PMID: 22770840. PMCID: PMC3472118.

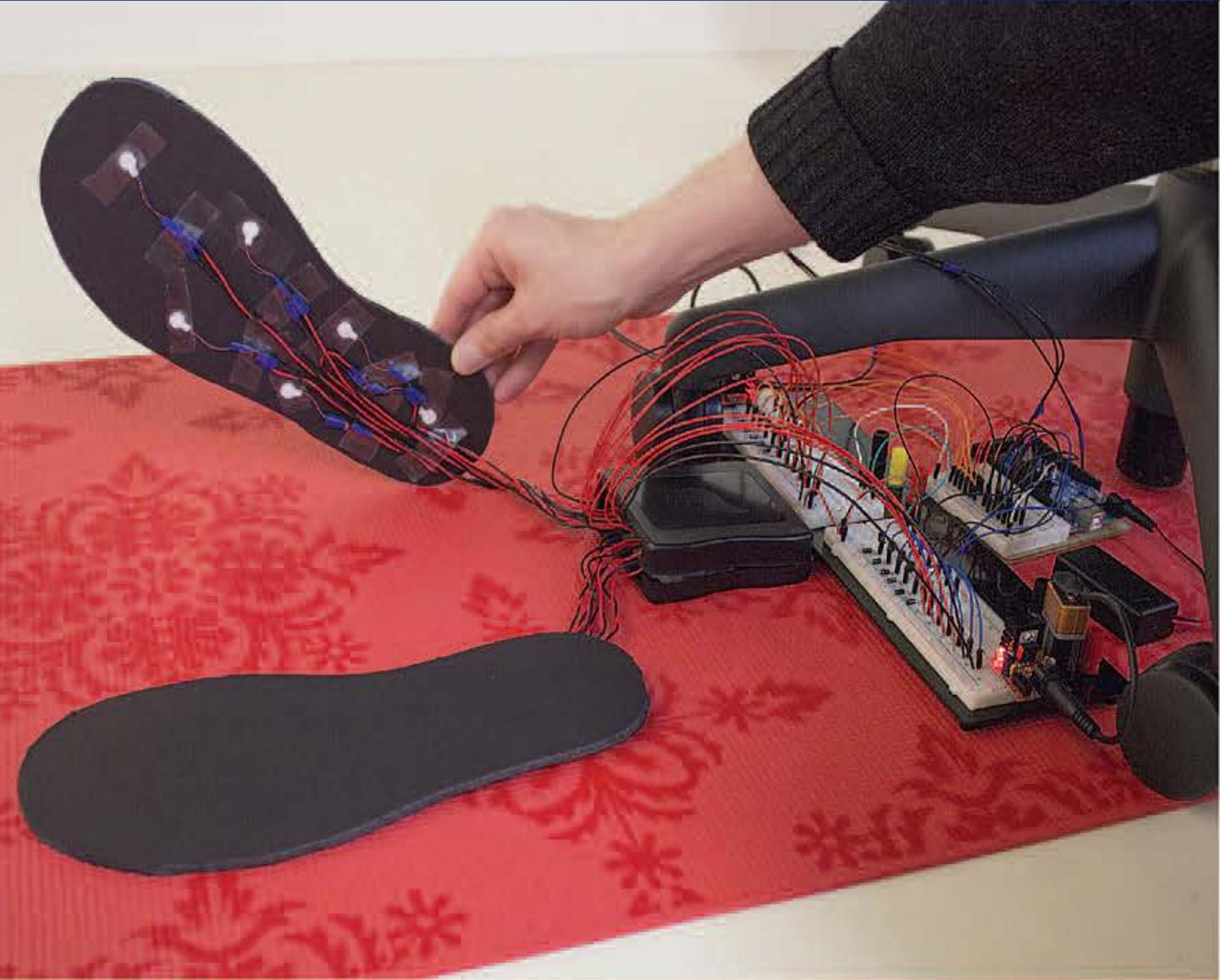
Schroeder, D.S., Korsakov, F., Jolton, J., Keefe, F.J., Haley, A., & Keefe, D.F. (in press) Creating widely accessible spatial interfaces: Mobile VR for managing persistent pain. *Spatial Interfaces*.



Application: Arthritis pain that occurs during transfer from sitting to standing and walking in place

Application:
Pain during sitting
following arthroscopic
hip surgery





Application:
Breakthrough
cancer pain flares



Conclusions

- 1. Our understanding of pain and pain coping has advanced considerably over the past 25 years.
- 2. We can measure pain coping reliably
- 3. By incorporating brief measures of pain coping into clinical practice we can understand pain better

Conclusions

Integrating coping skills training into medical treatment and focusing more directly on early intervention can lead to major advances

- Prevent pain
- Improve the quality of life
- Reduce the suffering of many individuals



- Special Thanks to:
 - Patients & caregivers
 - Support from NIH (NCI, NIAMS, NIDRR)
 - VA
 - Private foundations



NIAMS

National Institute of Arthritis and
Musculoskeletal and Skin Diseases



NATIONAL INSTITUTE ON DISABILITY
AND REHABILITATION RESEARCH

NIDRR

UNITED STATES
DEPARTMENT OF VETERANS AFFAIRS

