Multi-dimensional Pain Assessment

MiCCSI

David A. Williams, Ph.D.

Past-President, American Pain Society
Professor of Anesthesiology, Medicine, Psychiatry and Psychology
Associate Director, Chronic Pain and Fatigue Research Center
Director, Research Development, Michigan Institute for Clinical Health Research
University of Michigan Medical Center
Ann Arbor, Michigan

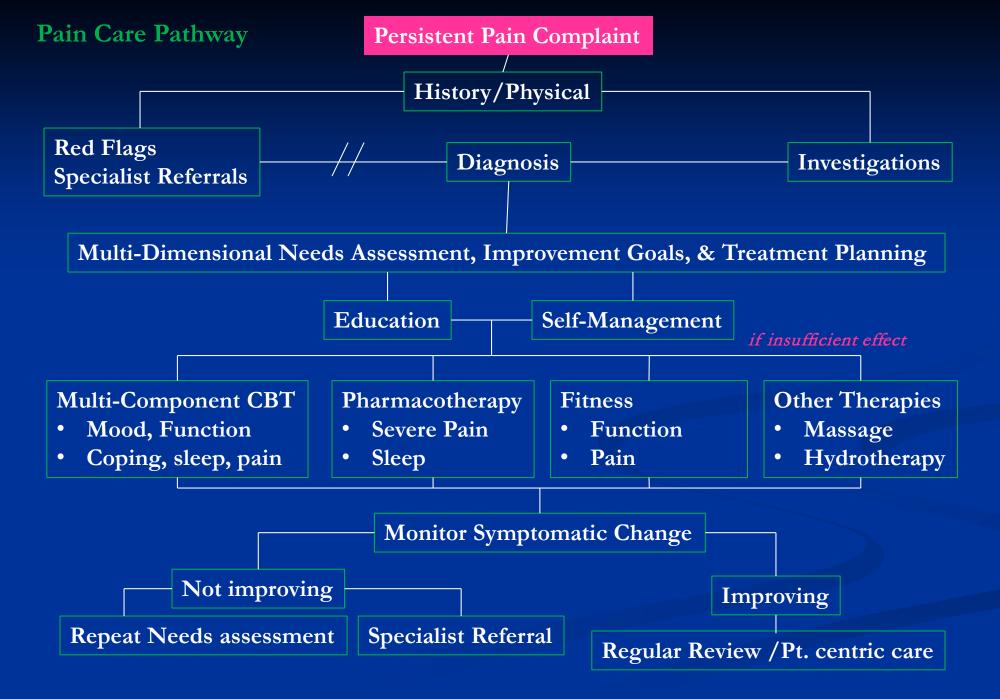
Disclosures

- Consultant to Community Health Focus Inc.
- President of the American Pain Society
- Chair of Steering Committee reviewing grants for APS sponsored by Pfizer
- Funded for research by NIH

There will be no use of off-label medications in this presentation.

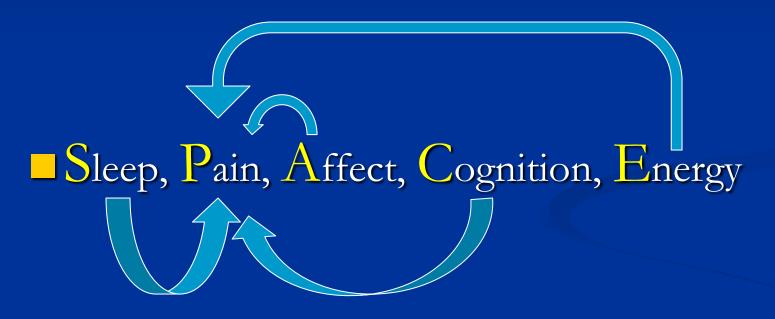
Multi-Dimensional Pain Assessment

- Documents targetable elements of chronic pain perception
- Monitors chronic pain perception over time
- Helps phenotype pain for research



Shared Neurotransmitters Explain

■ The complexity of chronic pain presentation



■ New targets for treating pain perception

Traditional Pain Assessment

Pain
Intensity
Location, Quality
Distribution
Temporality

Intensity

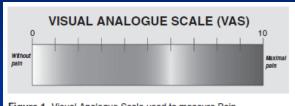
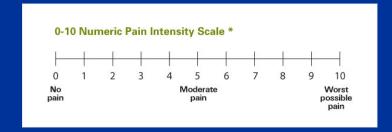
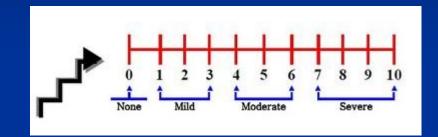


Figure 1. Visual Analogue Scale used to measure Pain.



Verbal Rating Scale: Discomfort Rating

- 0- Pain or Discomfort none
- 1- Pain or Discomfort I am aware of it, I think about it
- 2- Pain or Discomfort I am aware of it, I think about it but I can ignore it at times.
- 3- Pain or Discomfort I can't ignore it, but I can do my usual activities.
- 4- Pain or Discomfort It is difficult for me to concentrate; I can only do easy activities.
- 5- Pain or Discomfort Such that I cant do anything.

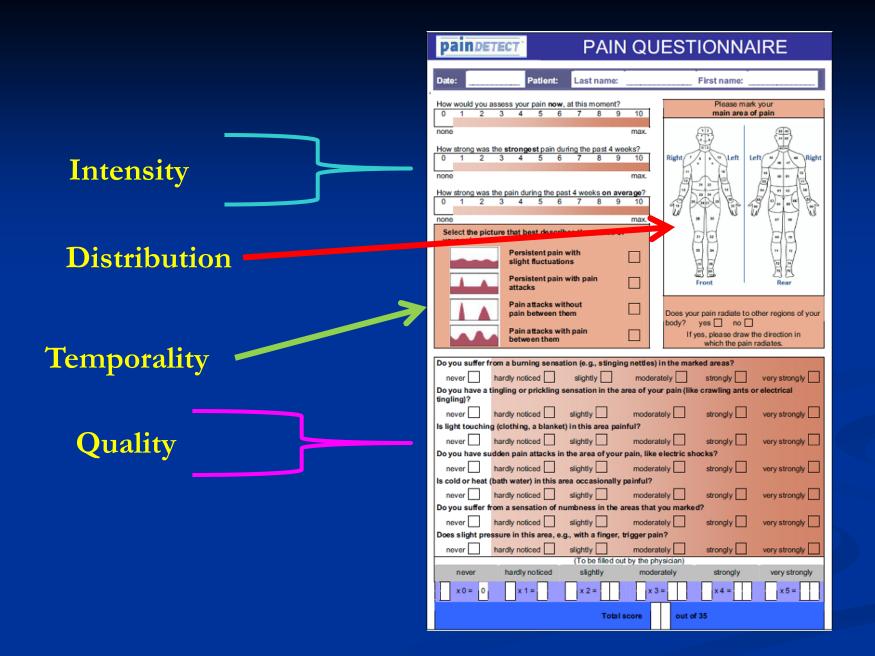




Brief Pain Inventory

Brief Pain Inventory (Short Form)							
 Throughout our lives, most of us have had pain from time to time (such as minor headaches, aprains, and toothaches). Have you had pain other than these everyday kinds of pain today? 							
□Yes □No							
2. On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.							
Front Back							
3. Please rate you in the last 24 h	ir pain by mari lours.	king the box b	eside the	number t	hat best	lescribes	your pain at its worst
0 1 No Pain	2	3 4	_ 5	<u>6</u>	_7	8	9 10 Pain As Bad As You Can Imagine
4. Please rate you least in the la		arking the bo	x beside	the num	iber that	best de	scribes your pain at its
0 1 No Pain	2	3 4	5	<u>6</u>	_7	8	9 10 Pain As Bad As You Can Imagine
Please rate you	ir pain by mari	ding the box b	eelde the	number t	hat best o	lescribes	your pain on the average.
0 1 No Pain	2	3 4	_ 5	□ 6	_7	8	9 10 Pain As Bad As You Can Imagine
6. Please rate you	ir pain by man	ding the box b	eelde the	number t	hat tells i	now much	pain you have right now.
0 1 No Pain	2	3 4	<u></u> 5	<u> 6 </u>	_7	8	9 10 Pain As Bad As You Can Imagine

7. What treatments or medications are you receiving for your pain?									
8. In the last mark the b	24 hours, h ox below th	ow much e percent	relief hav	ve pain tro most sho	eatments ws how n	or medie nuch reli	ations pro ef you ha	wided? P	lease ed.
0% 10% No Relief	20%	30%	40%	50%	60%	70%	80%		100% Complete Relief
9. Mark the bowth your:	ox beside th	e number	that desc	ribes how	, during t	ne past 24	hours, pa	in has inte	berein
A. General 0 Does Not Interfere		<u></u> 3	4	_5	<u> 6 </u>	_7	□8	9	10 Completely Interferes
B. Mood 0 1 Does Not Interfere	1 2	_3	4	□5	□ 6	7	□8	<u>9</u>	10 Completely Interferes
C. Walking 0 1 Does Not Interfere		□ 3	□ 4	□5	□6	7	□8	9	10 Completely Interferes
D. Normal 0 Does Not Interfere		ludes bo	oth work	k outside 5	e the ho	me and	housew 8	ork)	10 Completely Interferes
E. Relation Does Not Interfere		her peop	le □ 4	□ 5	□6	□ 7	□8	9	10 Completely Interferes
F. Sleep 0 0 1 Does Not Interfere		_3	4	<u></u> 5	□ 6	_ ₇	□8	9	10 Completely Interferes
G. Enjoym 0 Does Not Interfere	ent of life 1 2	□ 3	<u></u> 4	□5	□6	7	□8	9	10 Completely Interferes



Freynhagen R, Baron R, Gockel U, Tolle TR. painDETECT: a new screening questionnaire to identify neuropathic components in patients with back pain. Current medical research and opinion 2006;22:1911-20.

EMA Pain

Ex: Pain Diary

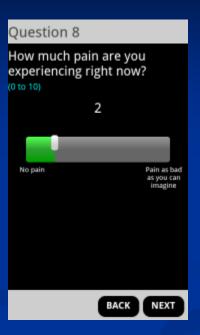
MONITORING PAIN DIARY

Instructions:

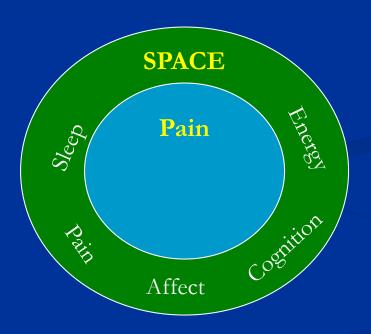
- 1. Keep a record of any pain you experience during any of the following periods with a 7 day diary.
- 2. Record how intense your pain was by rating it on a scale of 1 to 10 (1=not very painful to 10=highly painful).
- 3. Record what you were doing or the situation you were in when you experienced the pain.
- 4. Record your thoughts at the time of experiencing the pain.

This will help you to develop more awareness about your experiences of physical pain to help you identify strategies and techniques to help manage pain.

DAY	Brief description of type of pain	RATE 1-10	Situation/What you were doing	What you were thinking at the time
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				







Sleep

- Sleep Disturbances
 - PROMIS¹
 - MOS²
 - PSQI³
- Sleep-related Impairment
 - PROMIS¹

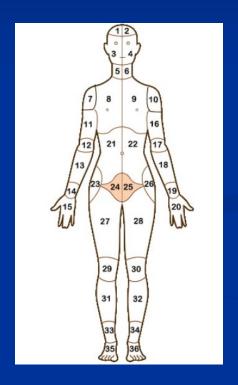


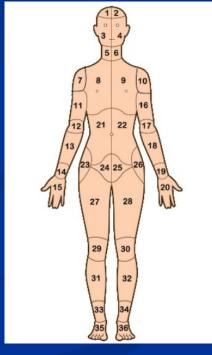
Sleep: ¹Cella D, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005-2008. J Clin Epidemiol. 2010;63(11):1179-94. ²Allen RP, et al. Psychometric evaluation and tests of validity of the Medical Outcomes Study 12-item Sleep Scale (MOS sleep). Sleep medicine. 2009;10(5):531-9. ³Buysse,D.J. et al. (1989). The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. Psychiatry Research, 28(2), 193-213. The detailed scoring instructions are at the end of this journal article.

Focal vs Wide-Spread Pain

- Body Maps
- Assess for local Vs.Wide-spread pain
- In IC, only 19% focal



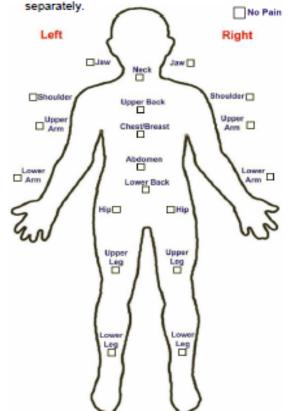




Fibromyalgia-ness

Fibromyalgia Symptoms (Modified ACR 2010 Fibromyalgia Diagnostic Criteria)

 Please indicate below if you have had pain or tenderness over the <u>past 7 days</u> in each of the areas listed below. Check the boxes in the diagram below for each area in which you have had pain or tenderness. Be sure to mark right and left sides separately.



Using the following scale, indicate for each item your severity over the past week by checking the appropriate box.

No problem

Slight or mild problems: generally mild or intermittent Moderate: considerable problems; often present and/or at a moderate level

Severe: continuous, life-disturbing problems

	No problem	Slight or mild	Moderate	Severe				
a. Fatigue								
 b. Trouble thinking or remembering 								
 c. Waking up tired (unrefreshed) 								
During the past 6 months have you had any of the following symptoms? No Yes								
a. Pain or cramps in lo	n 🗆							
b. Depression								
c. Headache								
4. Have the symptoms in questions 2-3 and pain been present at a similar								
level for at least 3 month	<u>ns</u> ?	No 🗆	Yes 🗆					
 Do you have a disorder that would otherwise explain the pain? No □ Yes □ 								

Affect and Chronic Pain

IASP Definition of Pain:

An unpleasant *sensory and emotional* experience associated with actual or potential tissue damage or described in terms of such damage¹

Affective Vulnerability:

Highly predictive of first onset of chronic pain (e.g., TMD).²

Neuroimaging Findings:

Compared to acute pain, chronic pain appears more like an emotional event than a sensory event.^{3,4}

¹IASP Pain Terminology. International Association for the Study of Pain Website. http://www.iasp-pain.org/AM/Template.cfm?Section=Pain_ Definitions&Template=/CM/HTMLDisplay.cfm&ContentID=1728#Pain. Updated 2007. Accessed January 6, 2011; 2 Fillingim et al, Psychological factors associated with development of TMD: the OPPERA prospective cohort study. J Pain, 14(12 supp2), 2013:T75-T90; ³Hashmi JA, et al, Shape shifting pain: chronification of back pain shifts brain representation from nociceptive to emotional circuits. Brain ,2013;136(Pt 9):2751-68; ⁴Denk F, McMahon SB, Tracey I. Pain vulnerability: a neurobiological perspective. Nature neuroscience. 2014;17(2):192-200.

Negative Affect

- Depression/Dysphoria
 - $CES-D^1$
 - PHQ-9²
 - PROMIS³

- Anxiety
 - STAI⁴
 - GAD-7⁵
 - PROMIS³

- Anger
 - STAXI⁶
 - PROMIS³

Negative Affect: ¹Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. Applied Psychological Measurement 1977;1:385-401. ²Kroenke K, et al. The PHQ-9: validity of a brief depression severity measure. JGenInternMed. 2001;16(9):606-13. ³Cella D, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005-2008. J Clin Epidemiol. 2010;63(11):1179-94. ⁴Spielberger CD, et al. Assessment of state and trait anxiety. Anxiety: psychobiological and clinical perspectives. Washington: Hemisphere/Taylor and Francis; 1991:69-83. ⁵Spitzer RL et al. A brief measure for assessing generalized anxiety disorder: the GAD-7. Archives of internal medicine. 2006;166(10):1092-7. ⁶Spielberger CD. STAXI-2: State-Trait Anger Expression Inventory - 2. Professional Manual. Odessa, FL: Psychological Assessment Resources (PAR), Inc.; 1999.

Positive Affect / Resilience

- Positive/Negative Affect
 - PANAS¹
- Affect Balance²
- Hardiness
- Grit
 - Short Grit Scale^{3,4}
- Optimism
- Determination/courage

- Satisfaction with life
 - SWL⁵
- Benefit Finding
- Gratitude
- Forgiveness
- Subjective Well-being
 - SWBS⁶
 - PROMIS Affect/Well-being⁷
- Sense of Coherence

Resilience and Positive Affect: ¹Watson D. et al. Development and validation of brief measures of positive and negative affect: The PANAS scales. Journal of Personality & Social Psychology 1988;54:1063-70. ²Hassett AL, et al. The relationship between affect balance style and clinical outcomes in fibromyalgia. Arthritis and Rheumatism. 2008;59(6):833-40. ³Duckworth AL, et al. Grit: perseverance and passion for long-term goals. *Journal of personality and social psychology*. Jun 2007;92(6):1087-1101. ⁴Duckworth AL, et al. Development and validation of the short grit scale (grit-s). *Journal of personality assessment*. Mar 2009;91(2):166-174. ⁵Diener E, et al. The Satisfaction With Life Scale. *Journal of personality assessment*. Feb 1985;49(1):71-75. ⁶Diener E. *Assessing Well-Being: The Collected Works of Ed Diener*. New York: Springer; 2009. ⁷Cella D, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005-2008. J Clin Epidemiol. 2010;63(11):1179-94

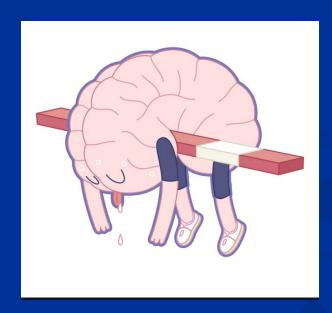
Dyscognition

- Perceived Problems
 - MASQ⁴
 - MISCI⁵



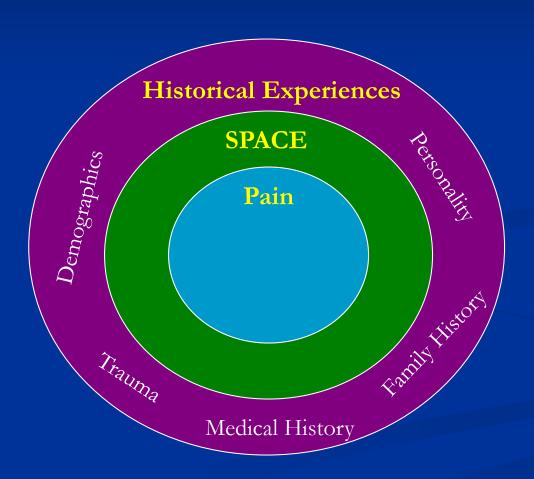
<u>Fatigue</u>

- Multidimensional Fatigue
 - MFI⁶
 - PROMIS¹



<u>Dyscognition</u>: ⁴Seidenberg M. et al. Development and validation of a Multiple Ability Self-Report Questionnaire. Journal of Clinical & Experimental Neuropsychology. 1994;16(1):93-104.; ⁵Kratz AL, et al. Development and Initial Validation of a Brief Self-Report Measure of Cognitive Dysfunction in Fibromyalgia. The J Pain, 2015.

<u>Fatigue:</u> ⁶Smets EM, et al. The Multidimensional Fatigue Inventory (MFI) psychometric qualities of an instrument to assess fatigue. Journal of Psychosomatic Research 1995;39:315-25.



Medical History

- Demographics
- Co-morbid medical conditions
- Current Treatments
- Medical History
- Family History

Trauma/Stress

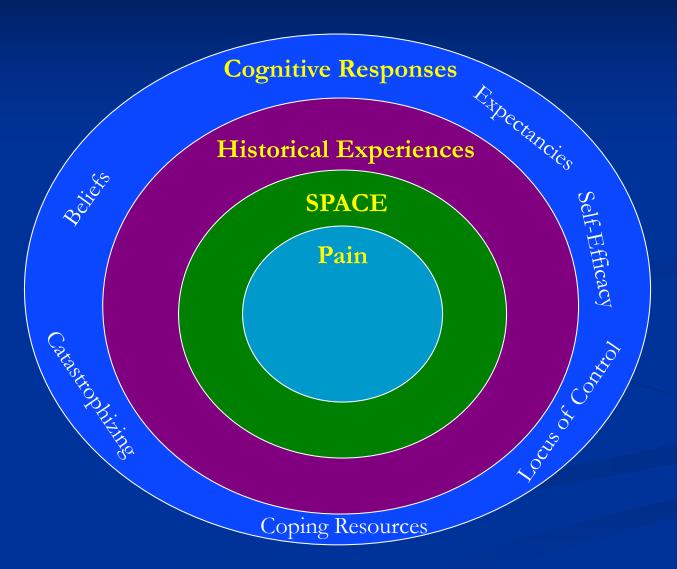
- Trauma
 - CTES/RTES⁷
- Stress
 - PSS⁸

Personality

- 5 Factor Model
 - Neuroticism
 - Extroversion
 - Openness
 - Conscientiousness
 - Agreeableness
- IPIP9
- TIPI¹⁰

<u>Trauma</u>: ⁷Pennebaker JW, et al. Disclosure of traumas and psychosomatic processes. SocSciMed. 1988;26(3):327-32.; ⁸Cohen S, et al. A global measure of perceived stress. JHealth SocBehav. 1983;24(4):385-96.

<u>Personality</u>: ⁹Goldberg, L. R., et al. (2006). The International Personality Item Pool and the future of public-domain personality measures. Journal of Research in Personality, 40, 84-96.; ¹⁰Gosling, S. D., et al. (2003). A Very Brief Measure of the Big Five Personality Domains. Journal of Research in Personality, 37, 504-528.



Pain Beliefs

- Multi-component
 - SOPA¹
 - PBPI²
 - BBCA³
- Locus of Control
 - $BPCQ^4$

Coping Resources

- Coping Strategies
 - CSQ^5
 - CPCI⁶
- Catastrophizing
 - \bullet PCS⁷
- Self-Efficacy
 - PSE⁸

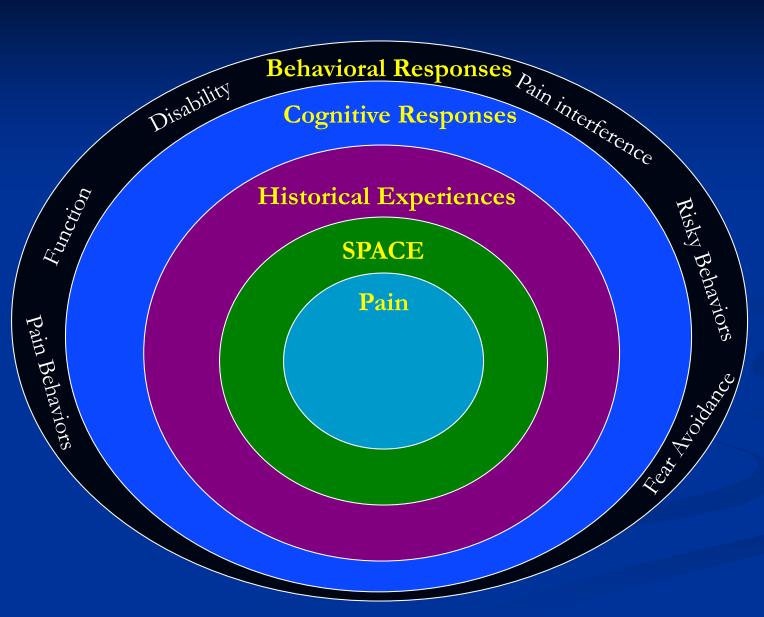
Expectancies

- Treatment Expectancy and credibility
 - TEC⁹

Beliefs: ¹Jensen MP, et al. Relationship of pain-specific beliefs to chronic pain adjustment. Pain. 1994;57(3):301-9.; ²Williams DA. et al., Pain beliefs: Assessment and utility. Pain. 1994;59(1):71-8. ³Jensen MP, et al. One- and two-item measures of pain beliefs and coping strategies. Pain. 2003;104(3):453-69. ⁴Skevington SM. A standardized scale to measure beliefs about controlling pain (BPCQ): A preliminary study. Psychology and Health 1990;4:221-32.

Coping: ⁵Rosenstiel AK, Keefe FJ. The use of coping strategies in chronic low back pain patients: Relationship to patient characteristics and current adjustment. Pain 1983;17:33-44; ⁶Jensen MP, et al. The Chronic Pain Coping Inventory: development and preliminary validation. Pain. 1995;60(2):203-16. ⁷Sullivan M, et al.. The Pain Catastrophizing Scale: Development and validation. Psychological Assessments 1995;7:524-32. ⁸Lorig K, et al. Development and evaluation of a scale to measure perceived self-efficacy in people with arthritis. Arthritis & Rheumatism 1989;32:37-44.

Expectancies: ⁹Smeets RJ, et al,. Treatment expectancy and credibility are associated with the outcome of both physical and cognitive-behavioral treatment in chronic low back pain. The Clinical journal of pain. 2008;24(4):305-15.



Functioning

- Multidimensional Functioning
 - SF-36¹
 - WHO-DAS $2.\overline{0^2}$
- Pain Interference
 - BPI³ (interference)
- Disability
 - PDI⁴

Pain Behaviors

• PROMIS⁵

Fear Avoidance

 \bullet TSK⁶

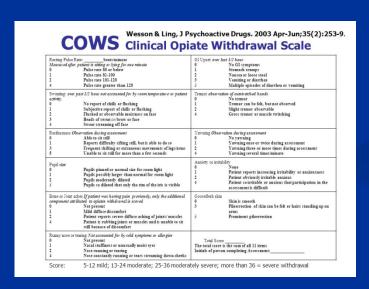
Functional Status: ¹Ware JE, et al. How to Score Version Two of the SF-36r Health Survey. Lincoln, RI: QualityMetric, Inc.; 2000. ²World Health Organization. Measuring health and disability: manual for WHO disability assessment schedule (WHODAS 2.0), World Health Organization, 2010, Geneva. ³Cleeland C. The Brief Pain Inventory: User Guide. Houston, TX: MD Anderson Cancer Center; 2009. ⁴Tait RC, et al. The Pain Disability Index: Psychometric properties. Pain. 1990;40(2):171-82.

Pain Behaviors and Fear Avoidance: ⁵Revicki DA, et al. Development and psychometric analysis of the PROMIS pain behavior item bank. Pain. 2009;146(1-2):158-69. ⁶ Burwinkle, T., et al. (2005). Fear of movement: factor structure of the Tampa Scale of Kinesiophobia in patients with fibromyalgia syndrome. The Journal of Pain, 6(6), 384-391.

Substance Use

- Tobacco
 - 5FTQ
- Alcohol
 - ⁶CAGE
 - ⁷AUDIT
- Opiates
 - 8ORT
 - ⁹COWS
- Illicit Drugs
 - ¹⁰DAST

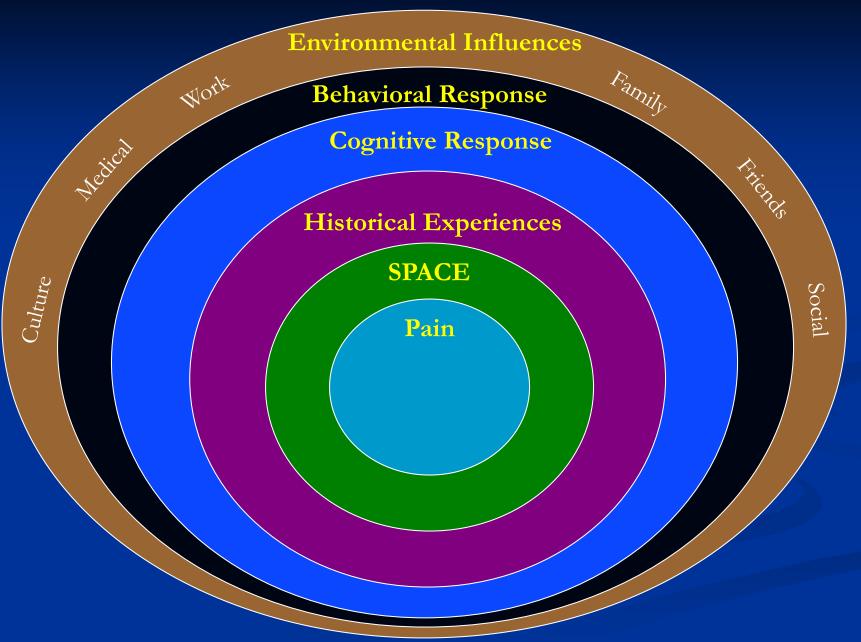








Substance Usage: ⁵Heatherton TF, et al. The Fagerstrom Test for Nicotine Dependence: A revision of the Fagerstrom Tolerance Questionnaire. British Journal of Addiction. 1991;86(9):1119-27. ⁶Ewing JA. Detecting alcoholism. The CAGE questionnaire. JAMA, 1984;252(14):1905-7. ⁷Babor, TF, AUDIT, World Health Organization, Geneva (2001). ⁸Webster, LR & Webster, R (2005), Pain Med 6(6):432. ⁹Wesson, DR et al (2003). COWS. J. Psychoactive Drugs, 35(2):253-259. ¹⁰Skinner., HA (1982) Addictive Behavior, 7:363-371.



Social

- Multicomponent Social Functioning
 - WHYMPI¹
- Social Enfranchisement
 - PE²

Family

- Dyadic Adjustment
 - DAS 3

Work

- Work Productivity/Impairment
 - WPAI⁴



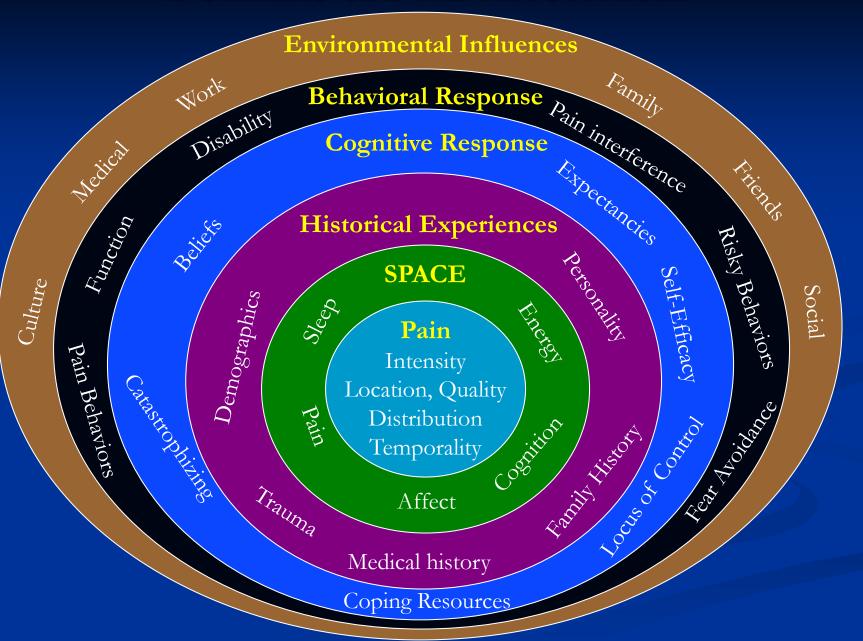




Social: ¹Kerns RD, Turk DC, Rudy TE. The West Haven-Yale Multidimensional Pain Inventory (WHYMPI). Pain 1985;23:345-56. ²Heinemann AW, Lai JS, et al. Measuring participation enfranchisement. Arch Phys Med Rehabil. 2011 Apr;92(4):564:71.

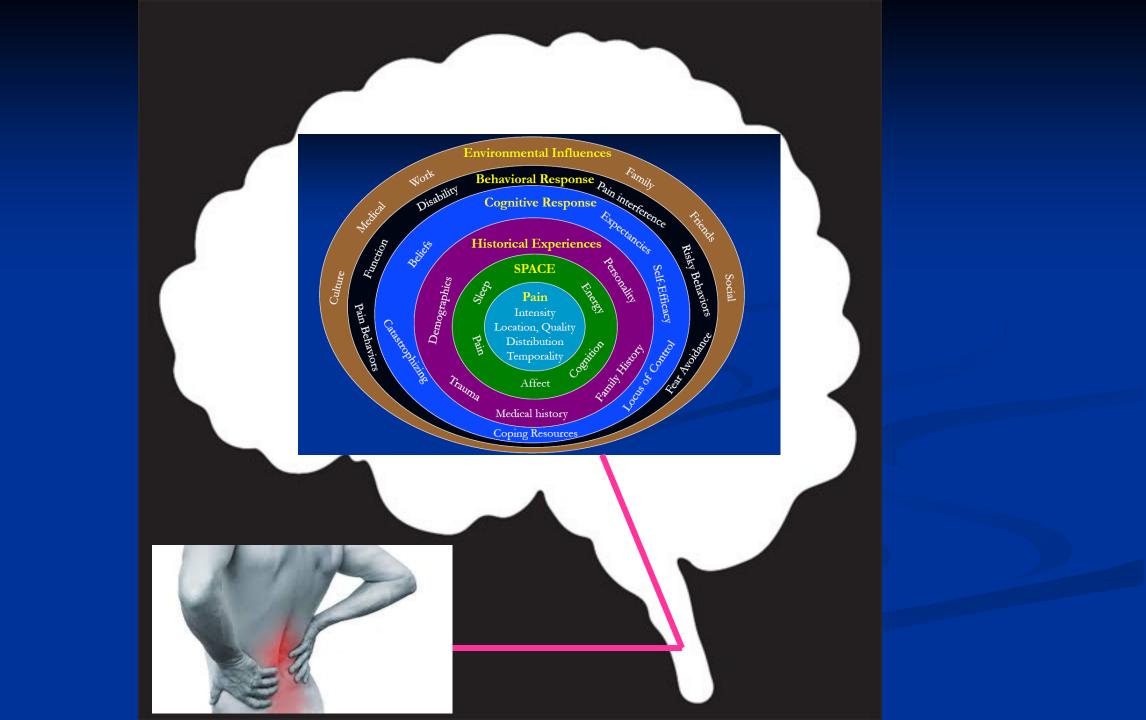
Family: ³Spanier GB. The measurement of marital quality. J Sex Marital Ther

Work: ⁴Reilly MC, Zbrozek AS, Dukes EM. The validity and reproducibility of a work productivity and activity impairment instrument. PharmacoEconomics 1993; 4(5):353-65.



Do we need to assess everything?





How to ERASE S.P.A.C.E.

Emotions

Reflections

Actions

Sleep

Environment

Sleep, Pain, Affect, Cognitive changes, Energy deficits

Targets

- Self-Management
 - Behavioral Sleep Strategies
 - Pacing
 - Social
- Physical Therapy
 - Functional status
- Cognitive Behavioral Therapy
 - Anxiety
 - Beliefs