Multi-dimensional Pain Assessment

MiCCSI

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Disclosures

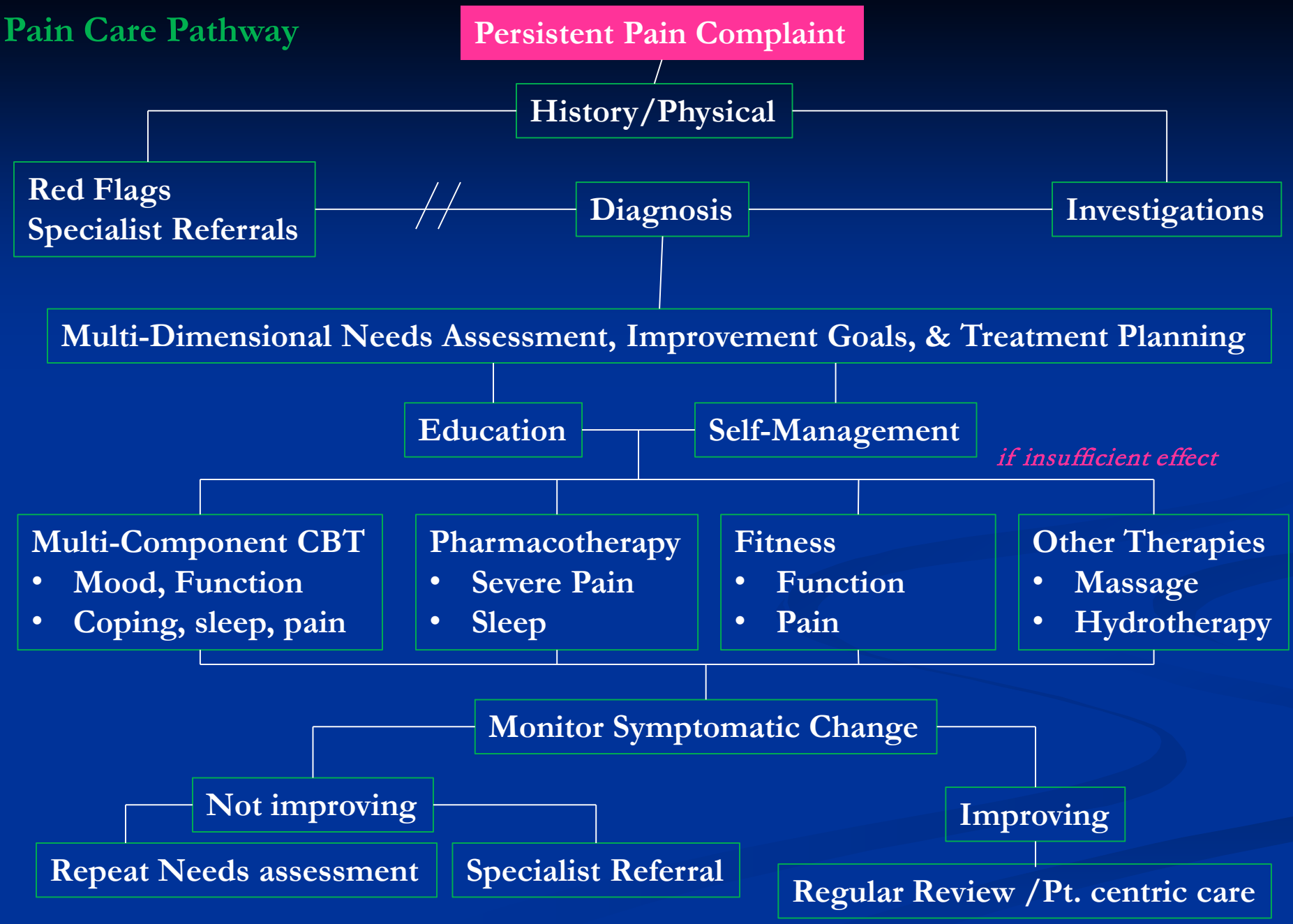
- Consultant to Community Health Focus Inc.
- President of the American Pain Society
- Chair of Steering Committee reviewing grants for APS sponsored by Pfizer
- Funded for research by NIH

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

Pain Care Pathway



Adapted from Macfarlane et al. Ann Rheum Dis, 2017;76:318-328; Lee, et al., BJA 2014; 112:16-24; Peterson et al, VA ESP Project #09-199, 2017

Shared Neurotransmitters Explain

- The complexity of chronic pain presentation

- Sleep, Pain, Affect, Cognition, Energy
- New targets for treating pain perception

Williams, DA (2018). JABR, 23(2):e12135. Schrepf, A et al., JPain, 2018 (in press).

Traditional Pain Assessment

Adapted from Williams, DA. Curr Opin. Urol. 2013;23(6) 554-9

Intensity

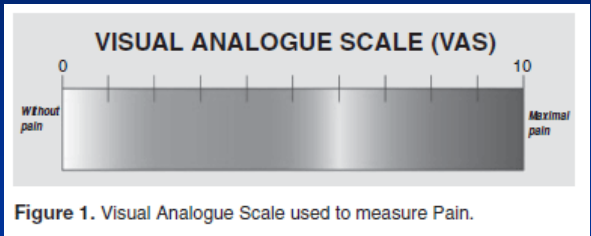
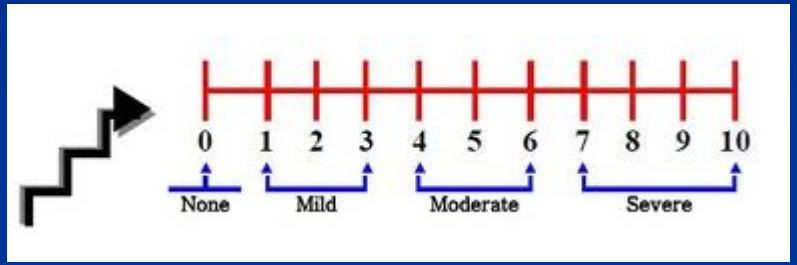
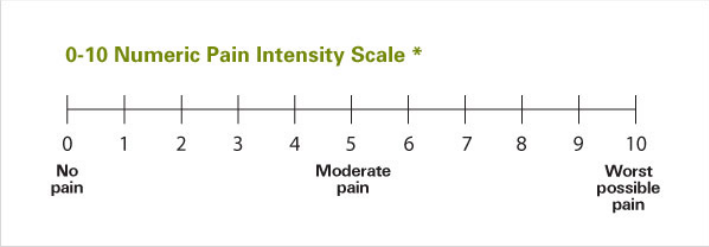


Figure 1. Visual Analogue Scale used to measure Pain.





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.**

Jensen MP, Karoly P. Self-report scales and procedures for assessing pain in adults. In: Turk DC, Melzack R, eds. Handbook of Pain Assessment. New York, NY: the Guilford Press; 2011:19-44.

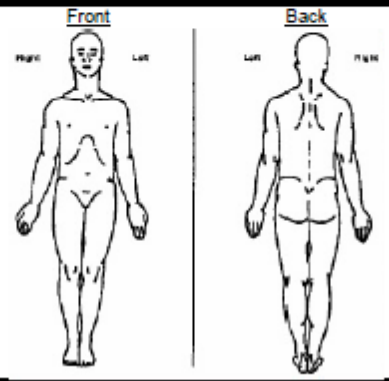
Brief Pain Inventory

Brief Pain Inventory (Short Form)

1. Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, 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.



3. Please rate your pain by marking the box beside the number that best describes your pain at its **worst** in the last 24 hours.

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
No Pain — Pain As Bad As You Can Imagine

4. Please rate your pain by marking the box beside the number that best describes your pain at its **least** in the last 24 hours.

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
No Pain — Pain As Bad As You Can Imagine

5. Please rate your pain by marking the box beside the number that best describes your pain on the **average**.

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
No Pain — Pain As Bad As You Can Imagine

6. Please rate your pain by marking the box beside the number that tells how much pain you have **right now.**

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
No Pain — Pain As Bad As You Can Imagine

7. What treatments or medications are you receiving for your pain?

8. In the last 24 hours, how much relief have pain treatments or medications provided? Please mark the box below the percentage that most shows how much **relief** you have received.

0% ☐ No Relief — 10% ☐ — 20% ☐ — 30% ☐ — 40% ☐ — 50% ☐ — 60% ☐ — 70% ☐ — 80% ☐ — 90% ☐ — 100% ☐ Complete Relief

9. Mark the box beside the number that describes how, during the past 24 hours, pain has interfered with your:

A. General Activity

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
Does Not Interfere — Completely Interferes

B. Mood

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
Does Not Interfere — Completely Interferes

C. Walking ability

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
Does Not Interfere — Completely Interferes

D. Normal Work (includes both work outside the home and housework)

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
Does Not Interfere — Completely Interferes

E. Relations with other people

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
Does Not Interfere — Completely Interferes

F. Sleep

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
Does Not Interfere — Completely Interferes

G. Enjoyment of life

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9 ☐10
Does Not Interfere — Completely Interferes

Cleeland, C. (2009). *The Brief Pain Inventory: User Guide*. Houston , TX: MD Anderson Cancer Center.

Intensity

Distribution

Temporality

Quality

painDETECT PAIN QUESTIONNAIRE

Date: Patient: Last name: First name:

How would you assess your pain **now**, at this moment?
0 1 2 3 4 5 6 7 8 9 10
none max.

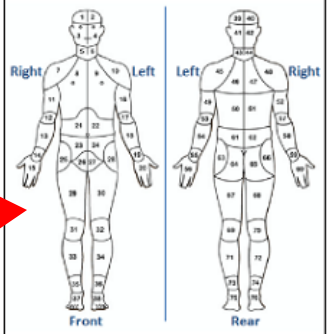
How strong was the **strongest** pain during the past 4 weeks?
0 1 2 3 4 5 6 7 8 9 10
none max.

How strong was the pain during the past 4 weeks **on average**?
0 1 2 3 4 5 6 7 8 9 10
none max.

Select the picture that best describes

- Persistent pain with slight fluctuations
- Persistent pain with pain attacks
- Pain attacks without pain between them
- Pain attacks with pain between them

Please mark your **main area of pain**



Does your pain radiate to other regions of your body? yes ☐ no ☐
If yes, please draw the direction in which the pain radiates.

Do you suffer from a burning sensation (e.g., stinging nettles) in the marked areas?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you have a tingling or prickling sensation in the area of your pain (like crawling ants or electrical tingling)?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Is light touching (clothing, a blanket) in this area painful?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you have sudden pain attacks in the area of your pain, like electric shocks?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Is cold or heat (bath water) in this area occasionally painful?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you suffer from a sensation of numbness in the areas that you marked?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Does slight pressure in this area, e.g., with a finger, trigger pain?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

(To be filled out by the physician)

never	hardly noticed	slightly	moderately	strongly	very strongly
x 0 = 0	x 1 =	x 2 =	x 3 =	x 4 =	x 5 =

Total score ☐☐ out of 35

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

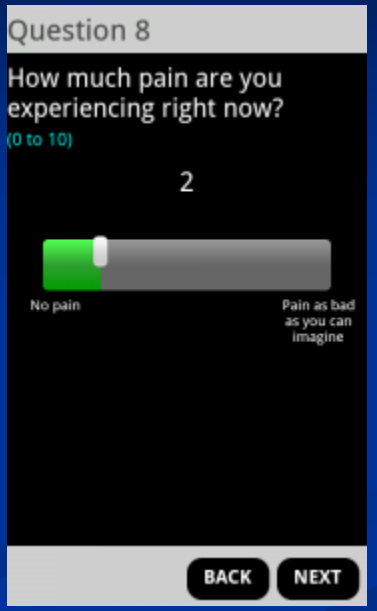
MONITORING PAIN DIARY

Instructions:

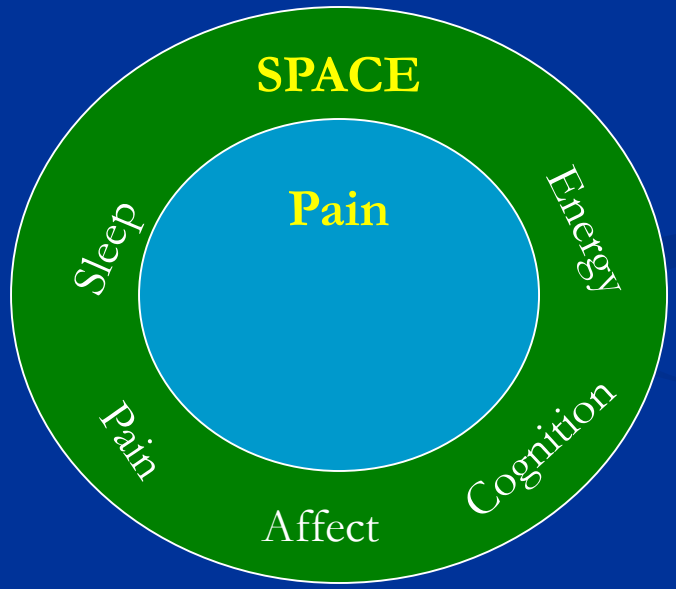
1. Keep a record of any pain you experience during any of the following periods with a 7 day diary.
2. Record how intense your pain was by rating it on a scale of 1 to 10 (1=not very painful to 10=highly painful).
3. Record what you were doing or the situation you were in when you experienced the pain.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



Domains of Pain Assessment



Adapted from Williams, DA. Curr Opin. Urol. 2013;23(6) 554-9

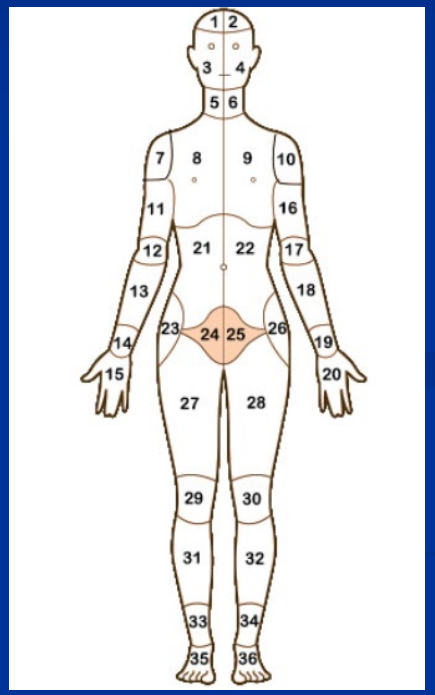
Sleep

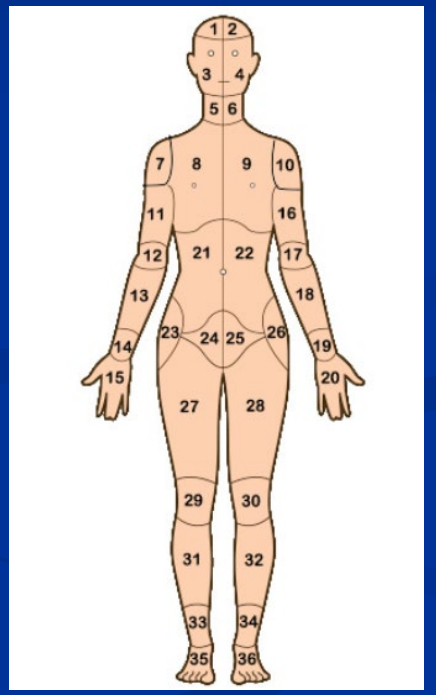
- Sleep Disturbances
  - PROMIS[1]
  - MOS[2]
  - PSQI[3]
- Sleep-related Impairment
  - PROMIS[1]

Sleep: [1]Cella 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. [2]Allen 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. [3]Buysse,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



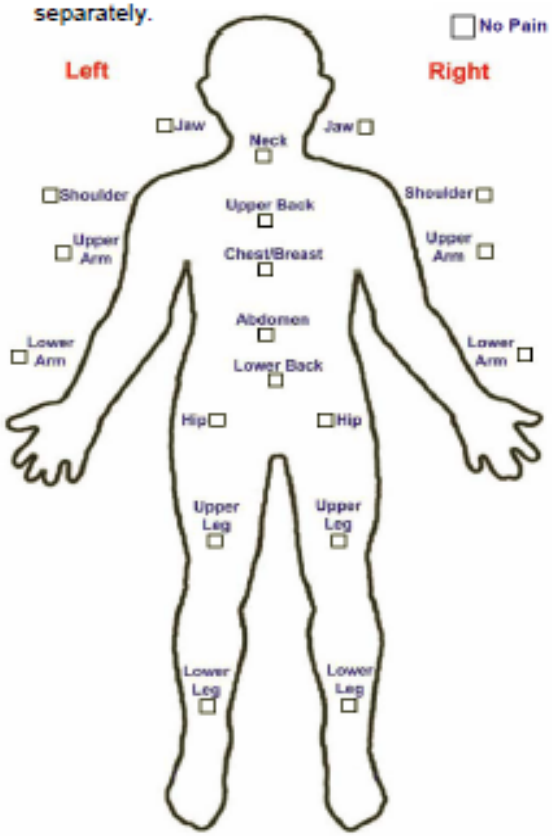


Nickel, JC. Clinical and psychological parameters associated with pain pattern phenotypes in women with interstitial cystitis/bladder pain syndrome. J Urol, 193 (1):138-44, (2015)

Fibromyalgia-ness

Fibromyalgia Symptoms (Modified ACR 2010 Fibromyalgia Diagnostic Criteria)

1. Please indicate below if you have had pain or tenderness over the past 7 days 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.



2. 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)	☐	☐	☐	☐

3. During the past 6 months have you had any of the following symptoms?

	No	Yes
a. Pain or cramps in lower abdomen	☐	☐
b. Depression	☐	☐
c. Headache	☐	☐

4. Have the symptoms in questions 2-3 and pain been present at a similar level for at least 3 months? **No** ☐ **Yes** ☐

5. Do you have a disorder that would otherwise explain the pain? **No** ☐ **Yes** ☐

FDC, fibromyalgia diagnostic criteria
Wolfe F et al. *J Rheum*. 2011;38;1113-1122.

Fibromyalgia-ness:
•WPI+SS ≥ 13 cut point

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 damage[1]

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]

[1]IASP 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; [3]Hashmi 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; [4]Denk 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-9[2]
  - PROMIS[3]
- Anxiety
  - STAI[4]
  - GAD-7[5]
  - PROMIS[3]
- Anger
  - STAXI[6]
  - PROMIS[3]

Negative Affect: [1]Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. Applied Psychological Measurement 1977;1:385-401. [2]Kroenke K, et al. The PHQ-9: validity of a brief depression severity measure. JGenInternMed. 2001;16(9):606-13. [3]Cella 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. [4]Spielberger CD, et al. Assessment of state and trait anxiety. Anxiety: psychobiological and clinical perspectives. Washington: Hemisphere/Taylor and Francis; 1991:69-83. [5]Spitzer RL et al. A brief measure for assessing generalized anxiety disorder: the GAD-7. Archives of internal medicine. 2006;166(10):1092-7. [6]Spielberger 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
  - PANAS[1]
- Affect Balance[2]
- Hardiness
- Grit
  - Short Grit Scale[3,4]
- Optimism
- Determination/courage
- Satisfaction with life
  - SWL[5]
- Benefit Finding
- Gratitude
- Forgiveness
- Subjective Well-being
  - SWBS[6]
  - PROMIS Affect/Well-being[7]
- Sense of Coherence

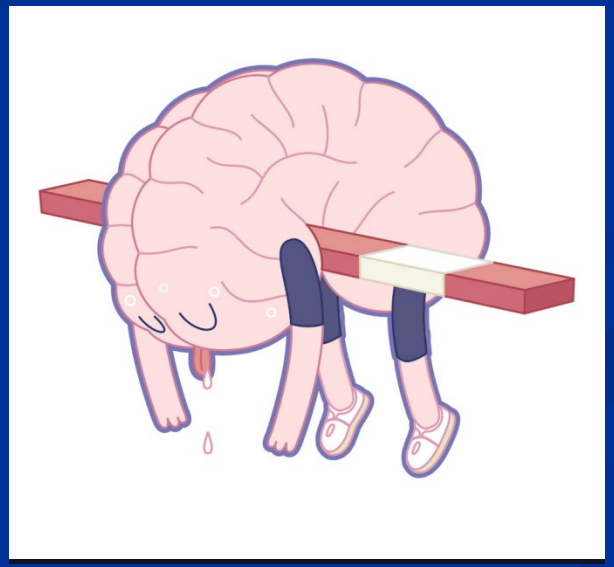
Resilience and Positive Affect: [1]Watson D. et al. Development and validation of brief measures of positive and negative affect: The PANAS scales. Journal of Personality & Social Psychology 1988;54:1063-70. [2]Hassett AL, et al. The relationship between affect balance style and clinical outcomes in fibromyalgia. Arthritis and Rheumatism. 2008;59(6):833-40. [3,]Duckworth AL, et al, Grit: perseverance and passion for long-term goals. *Journal of personality and social psychology*. Jun 2007;92(6):1087-1101. [4]Duckworth AL, et al. Development and validation of the short grit scale (grit-s). *Journal of personality assessment*. Mar 2009;91(2):166-174. [5]Diener E, et al. The Satisfaction With Life Scale. *Journal of personality assessment*. Feb 1985;49(1):71-75. [6]Diener E. *Assessing Well-Being: The Collected Works of Ed Diener*. New York: Springer; 2009. [7]Cella 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
  - MASQ[4]
  - MISCI[5]

Fatigue

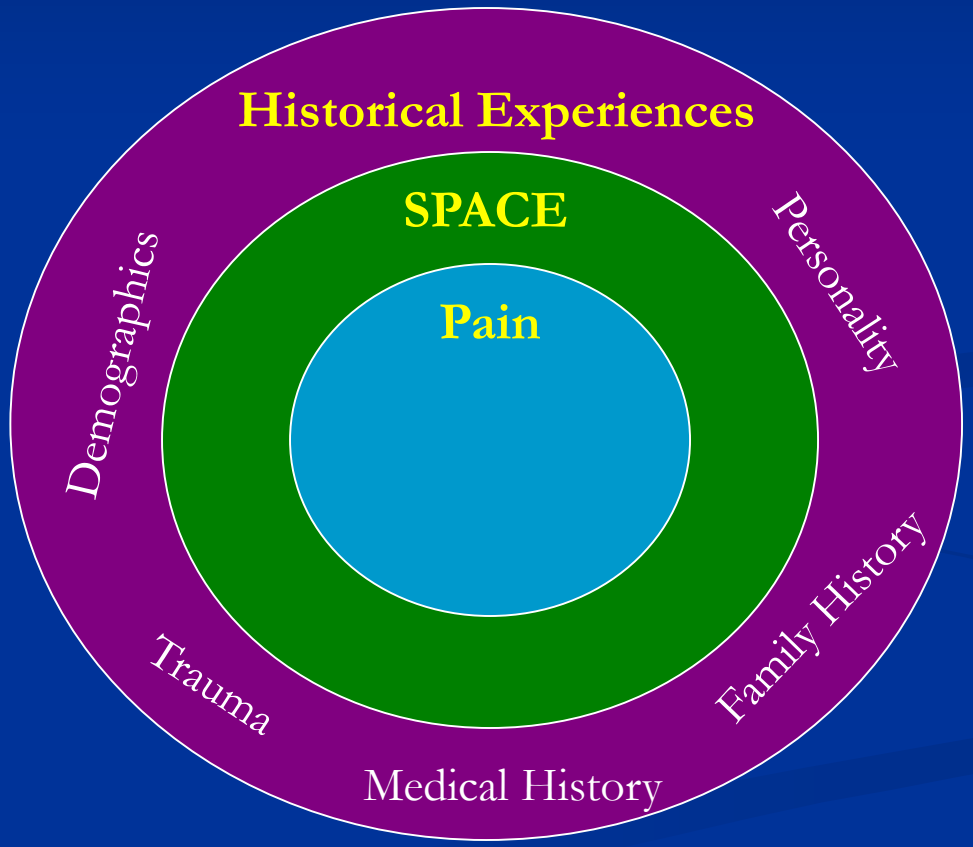
- Multidimensional Fatigue
  - MFI[6]
  - PROMIS[1]



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

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

Domains of Pain Assessment



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Medical History

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

Trauma/Stress

- Trauma
  - CTES/RTES[7]
- Stress
  - PSS[8]

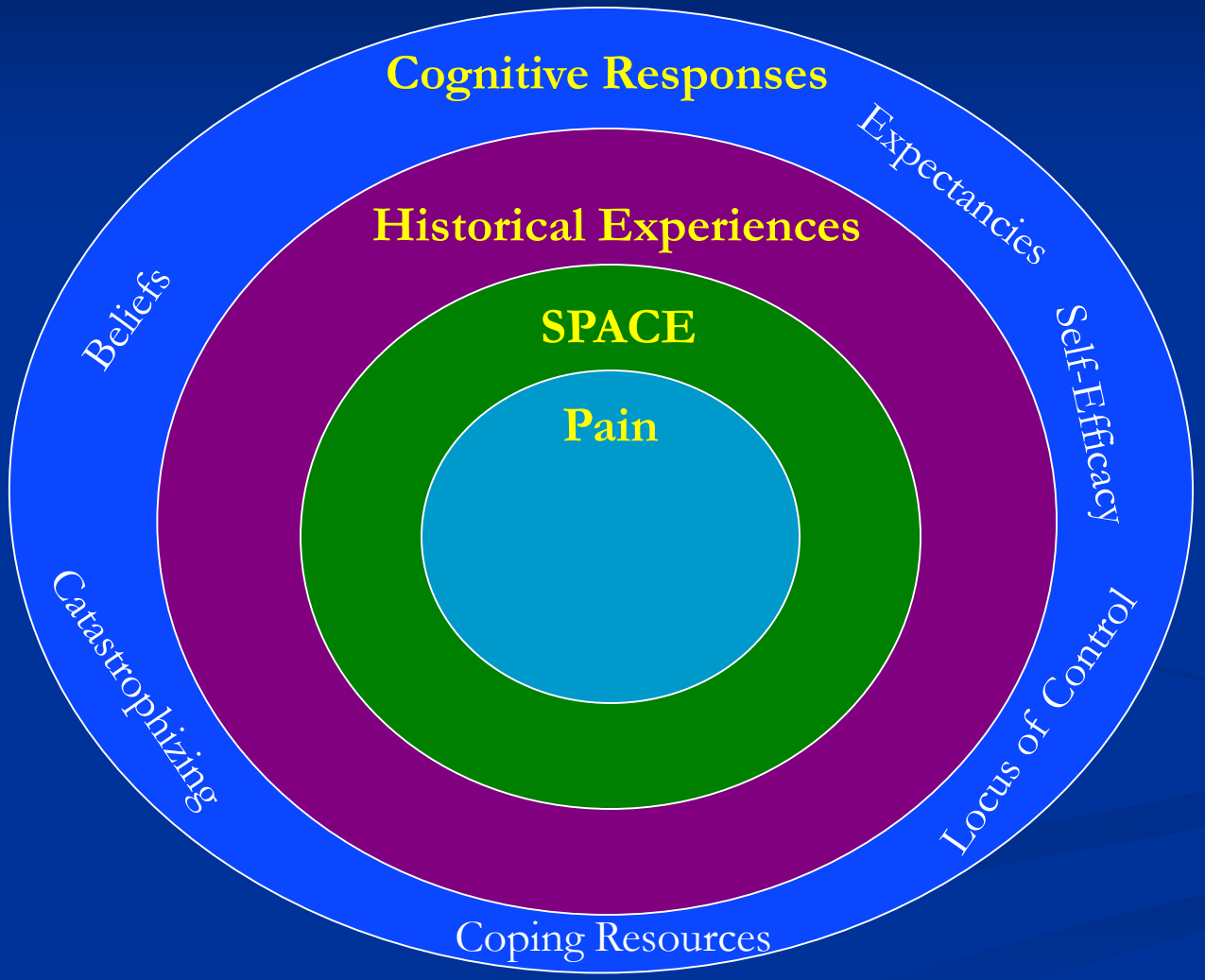
Personality

- 5 Factor Model
  - Neuroticism
  - Extroversion
  - Openness
  - Conscientiousness
  - Agreeableness
- IPIP[9]
- TIPI[10]

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

Personality: [9]Goldberg, 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.; [10]Gosling, S. D., et al. (2003). A Very Brief Measure of the Big Five Personality Domains. Journal of Research in Personality, *37, 504-528.*

Domains of Pain Assessment



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Pain Beliefs

- Multi-component
  - SOPA[1]
  - PBPI[2]
  - BBCA[3]
- Locus of Control
  - BPCQ[4]

Coping Resources

- Coping Strategies
  - CSQ[5]
  - CPCI[6]
- Catastrophizing
  - PCS[7]
- Self-Efficacy
  - PSE[8]

Expectancies

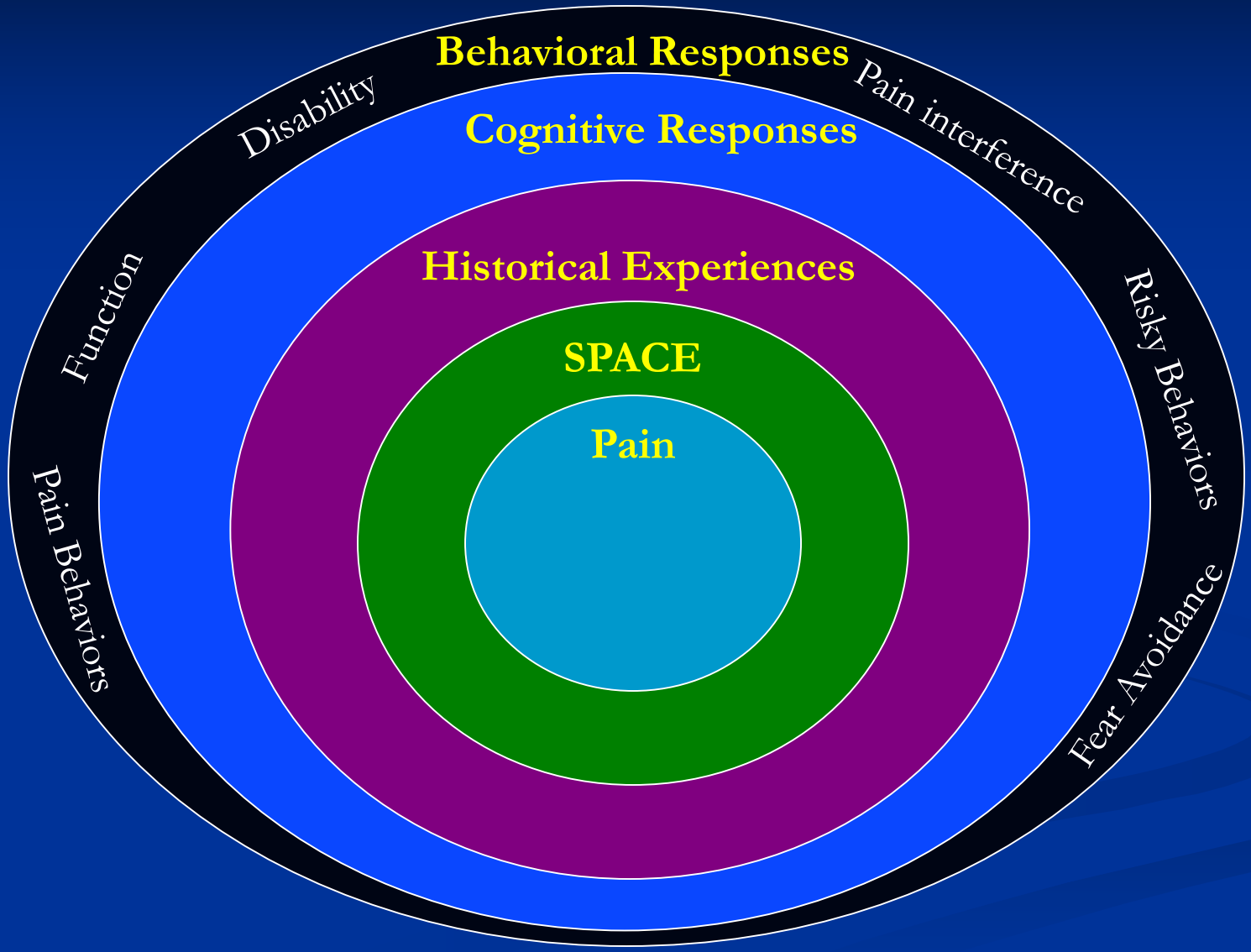
- Treatment Expectancy and credibility
  - TEC[9]

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

Coping: [5]Rosenstiel 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; [6]Jensen MP, et al. The Chronic Pain Coping Inventory: development and preliminary validation. Pain. 1995;60(2):203-16. [7]Sullivan M, et al.. The Pain Catastrophizing Scale: Development and validation. Psychological Assessments 1995;7:524-32. [8]Lorig 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: [9]Smeets 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.

Domains of Pain Assessment



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Functioning

- Multidimensional Functioning
  - SF-36[1]
  - WHO-DAS 2.0[2]
- Pain Interference
  - BPI[3] (interference)
- Disability
  - PDI[4]

Pain Behaviors

- PROMIS[5]

Fear Avoidance

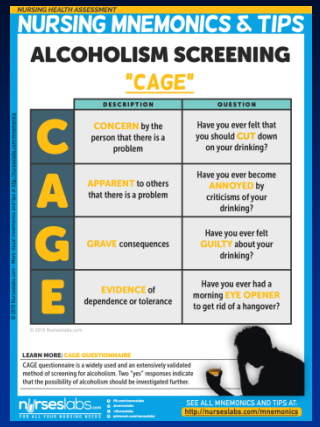
- TSK[6]

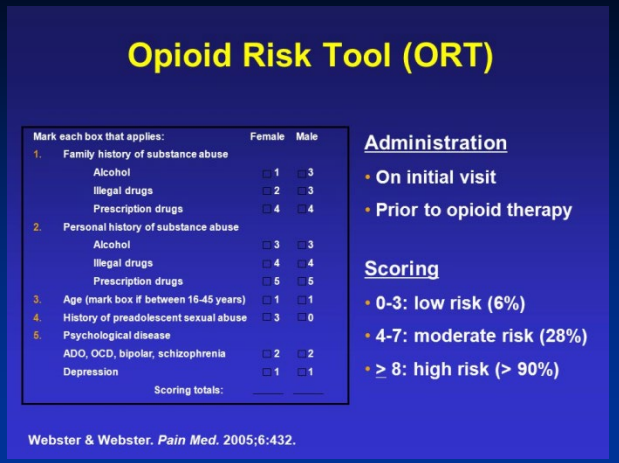
Functional Status: [1]Ware JE, et al. How to Score Version Two of the SF-36r Health Survey. Lincoln, RI: QualityMetric, Inc.; 2000. [2]World Health Organization. Measuring health and disability: manual for WHO disability assessment schedule (WHODAS 2.0), World Health Organization, 2010, Geneva. [3]Cleeland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

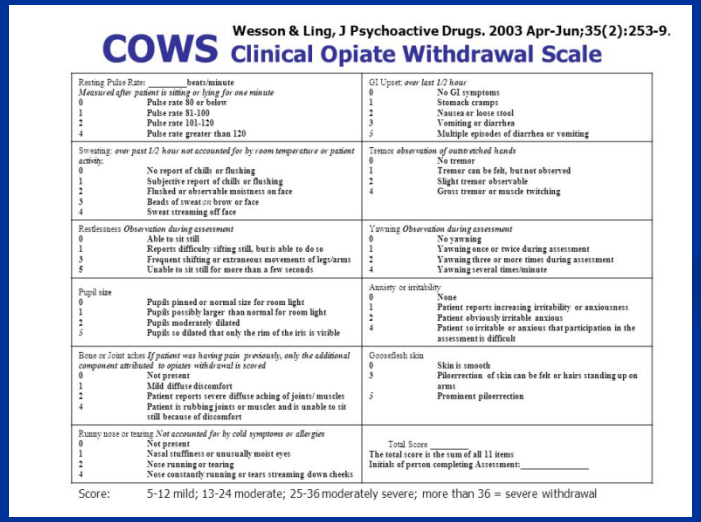
Pain Behaviors and Fear Avoidance: [5]Revicki DA, et al. Development and psychometric analysis of the PROMIS pain behavior item bank. Pain. 2009;146(1-2):158-69. [6] Burwinkle, T., et al. (2005). Fear of movement: factor structure of the Tampa Scale of Kinesiophobia in patients with fibromyalgia syndrome.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

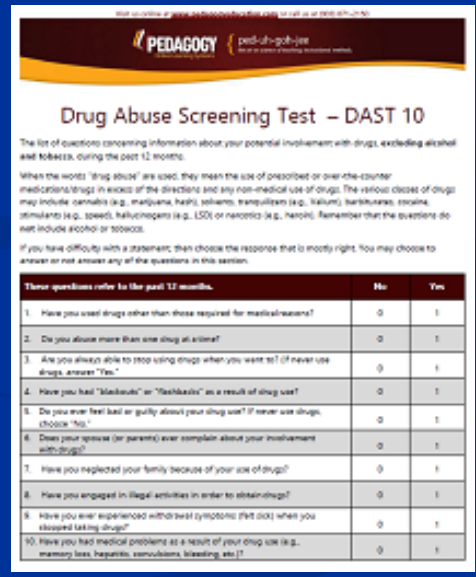
Substance Use

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



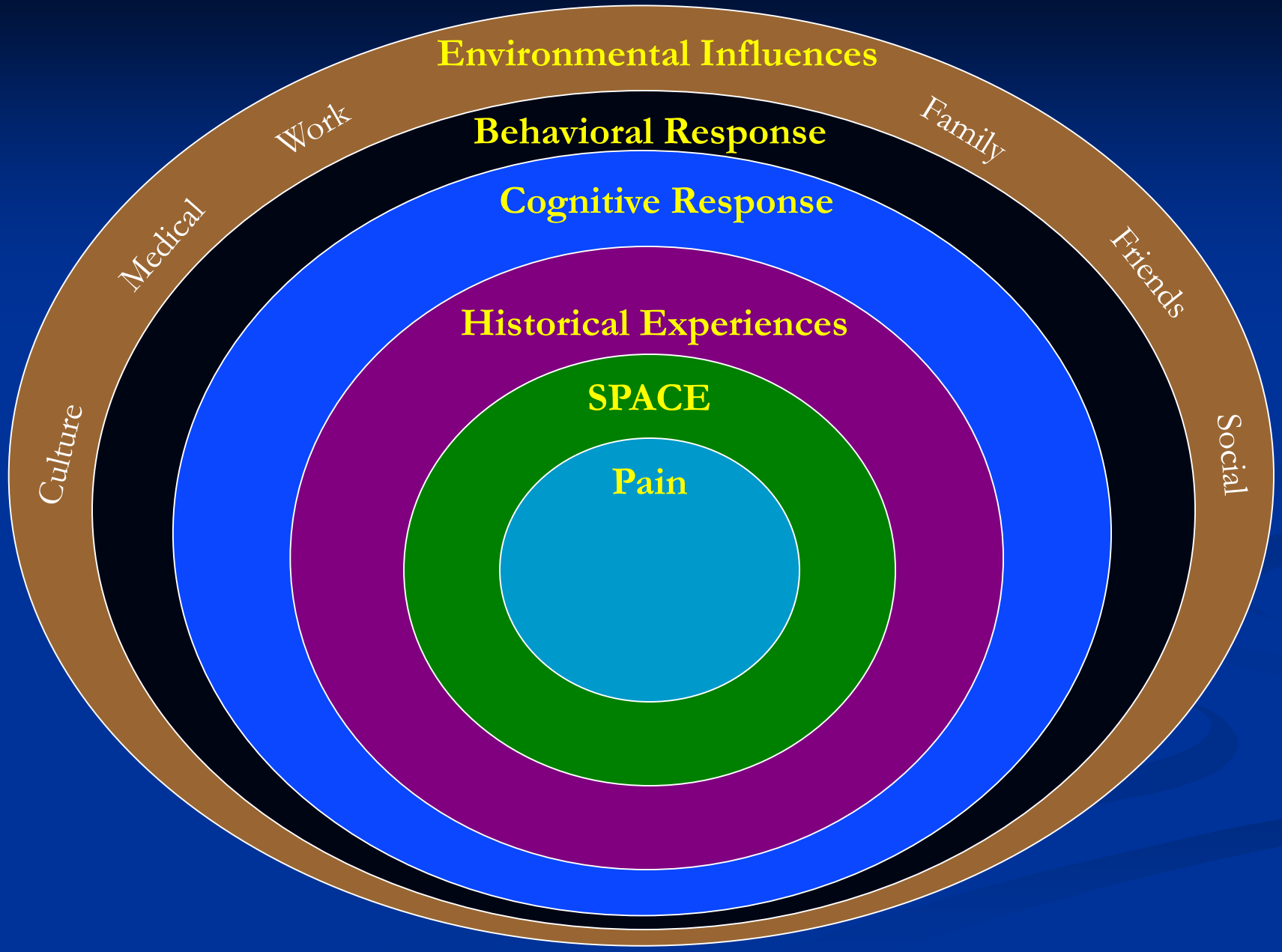






Substance Usage: [5]Heatherton TF, et al. The Fagerstrom Test for Nicotine Dependence: A revision of the Fagerstrom Tolerance Questionnaire. British Journal of Addiction. 1991;86(9):1119-27. [6]Ewing JA. Detecting alcoholism. The CAGE questionnaire. JAMA , 1984;252(14):1905-7. [7]Babor, TF , AUDIT, World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

Domains of Pain Assessment



Adapted from Williams, DA. Curr Opin. Urol. 2013;23(6) 554-9

Social

- Multicomponent Social Functioning
  - WHYMPI[1]
- Social Enfranchisement
  - PE[2]

Family

- Dyadic Adjustment
  - DAS[3]

Work

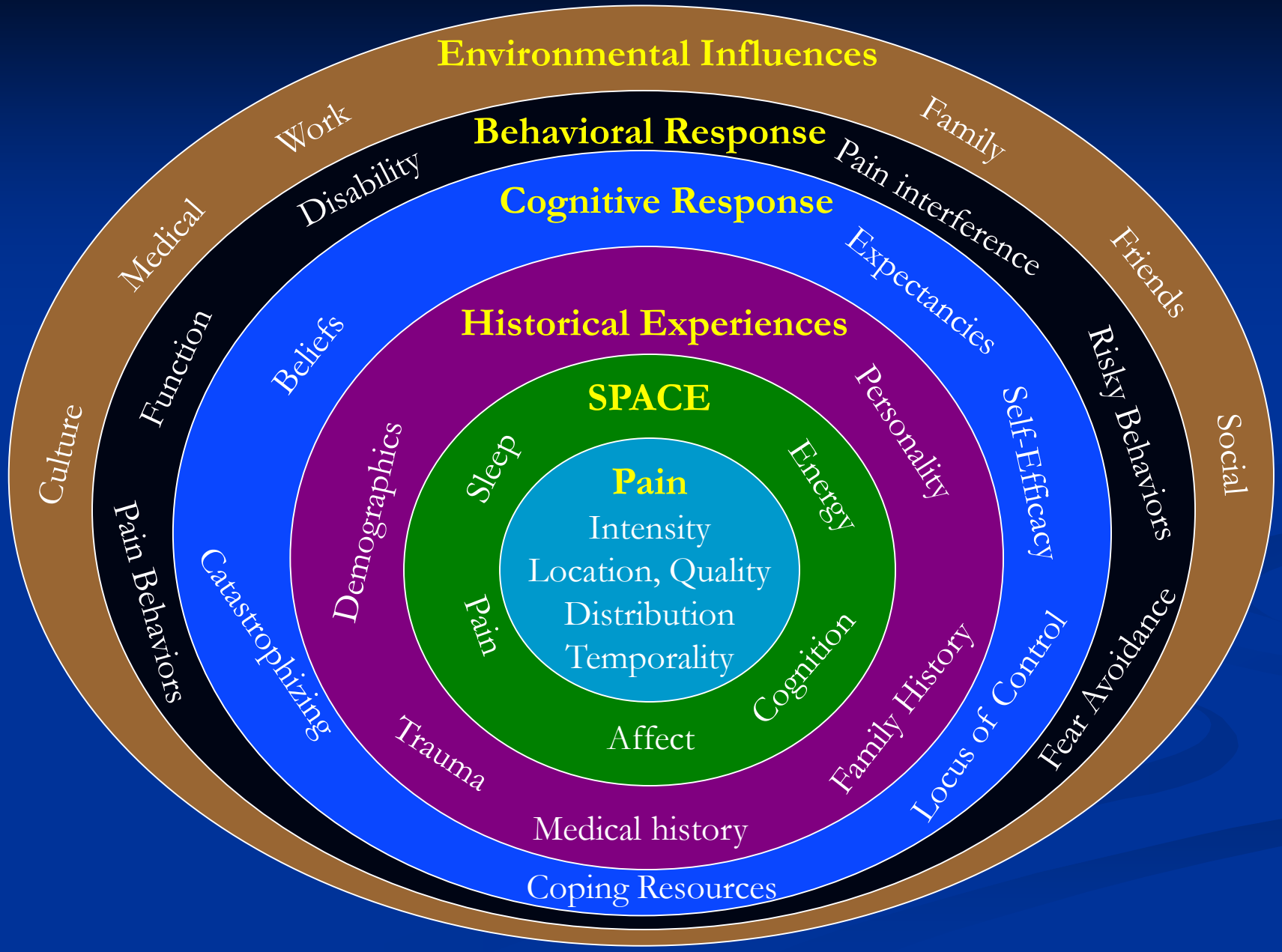
- Work Productivity/Impairment
  - WPAI[4]

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

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

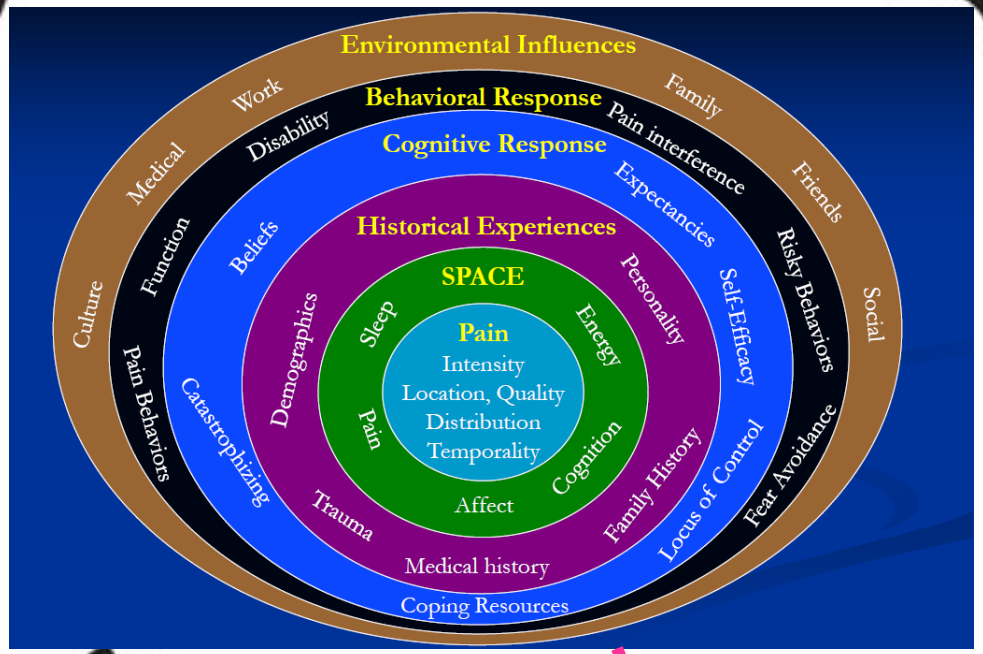
Work: [4]Reilly MC, Zbrozek AS, Dukes EM. The validity and reproducibility of a work productivity and activity impairment instrument. PharmacoEconomics 1993; 4(5):353-65.

Domains of Pain Assessment



Adapted from Williams, DA. Curr Opin. Urol. 2013;23(6) 554-9

Do we need to assess everything?


Environmental Influences
Work
Family
Medical
Friends
Culture
Social
Behavioral Response
Disability
Pain interference
Function
Risky Behaviors
Pain Behaviors
Fear Avoidance
Cognitive Response
Beliefs
Expectancies
Catastrophizing
Self-Efficacy
Locus of Control
Historical Experiences
Demographics
Personality
Trauma
Family History
SPACE
Sleep
Energy
Pain
Cognition
Affect
Pain
Intensity
Location, Quality
Distribution
Temporality
Medical history
Coping Resources

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

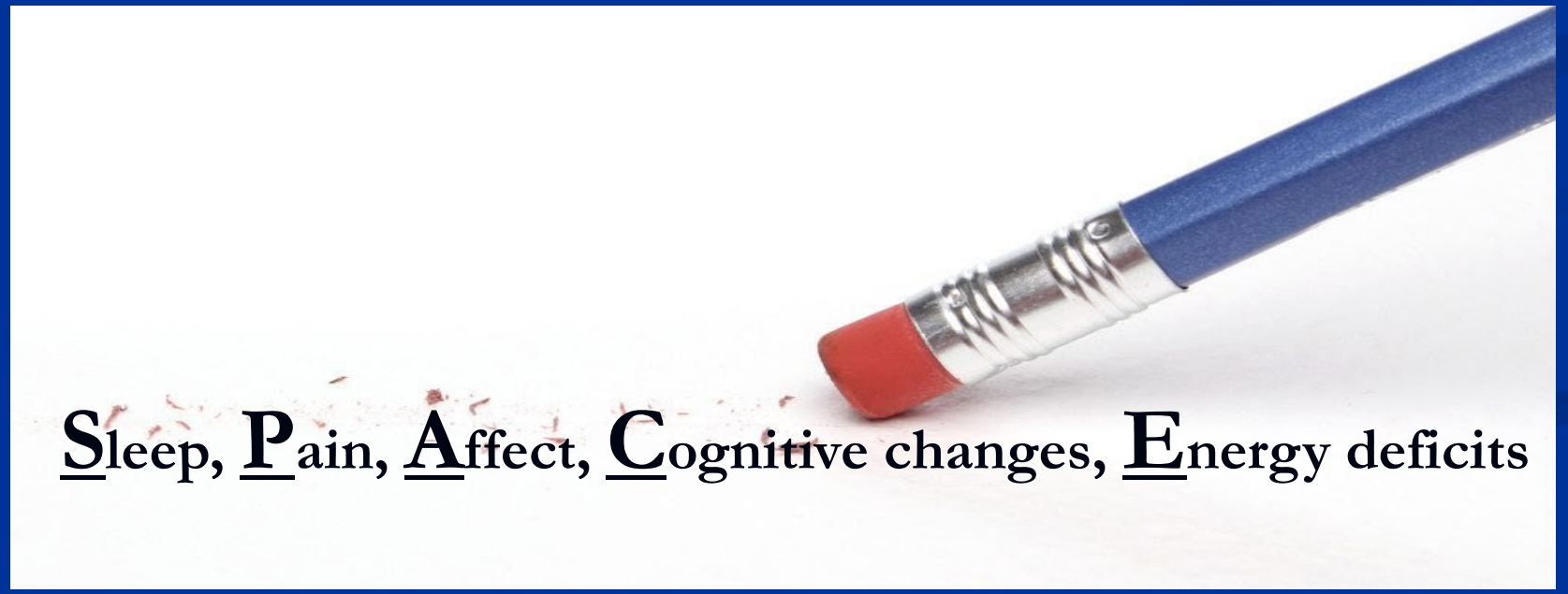
Emotions

Reflections

Actions

Sleep

Environment



Targets

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