

Chronic Pain as a Cause of Falls in Older Populations

Suzanne Leveille, PhD RN

*Department of Medicine
Beth Israel Deaconess Medical Center
Harvard Medical School
Boston, MA*



Supported by:

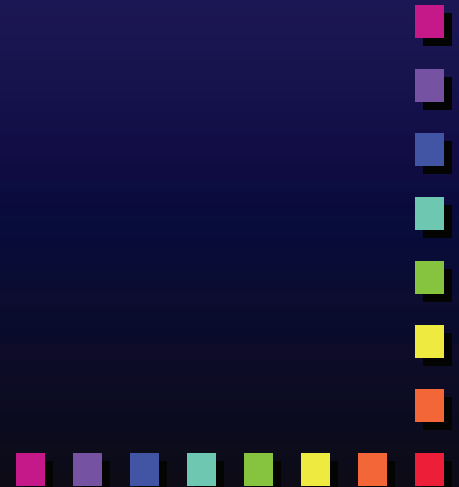
National Institute on Aging,
Research Nursing Home Program
Project #P01AG004390

Arthritis Investigator Award,
Arthritis Foundation



Outline

1. Background
2. WHAS findings on pain and falls
3. MOBILIZE Boston Study of pain as risk factor for falls



Background

Pain overlooked as potential cause of falls in epidemiological studies

Self-reported arthritis is indicator for musculoskeletal pain

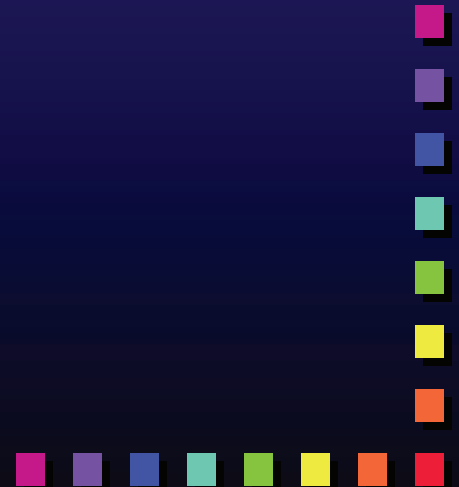
Self-reported arthritis: inconsistent findings re: falls risk in older populations.

Conceptual challenges in studying pain in older adults



Research Question

Does chronic musculoskeletal pain lead to **falls** in older disabled women?



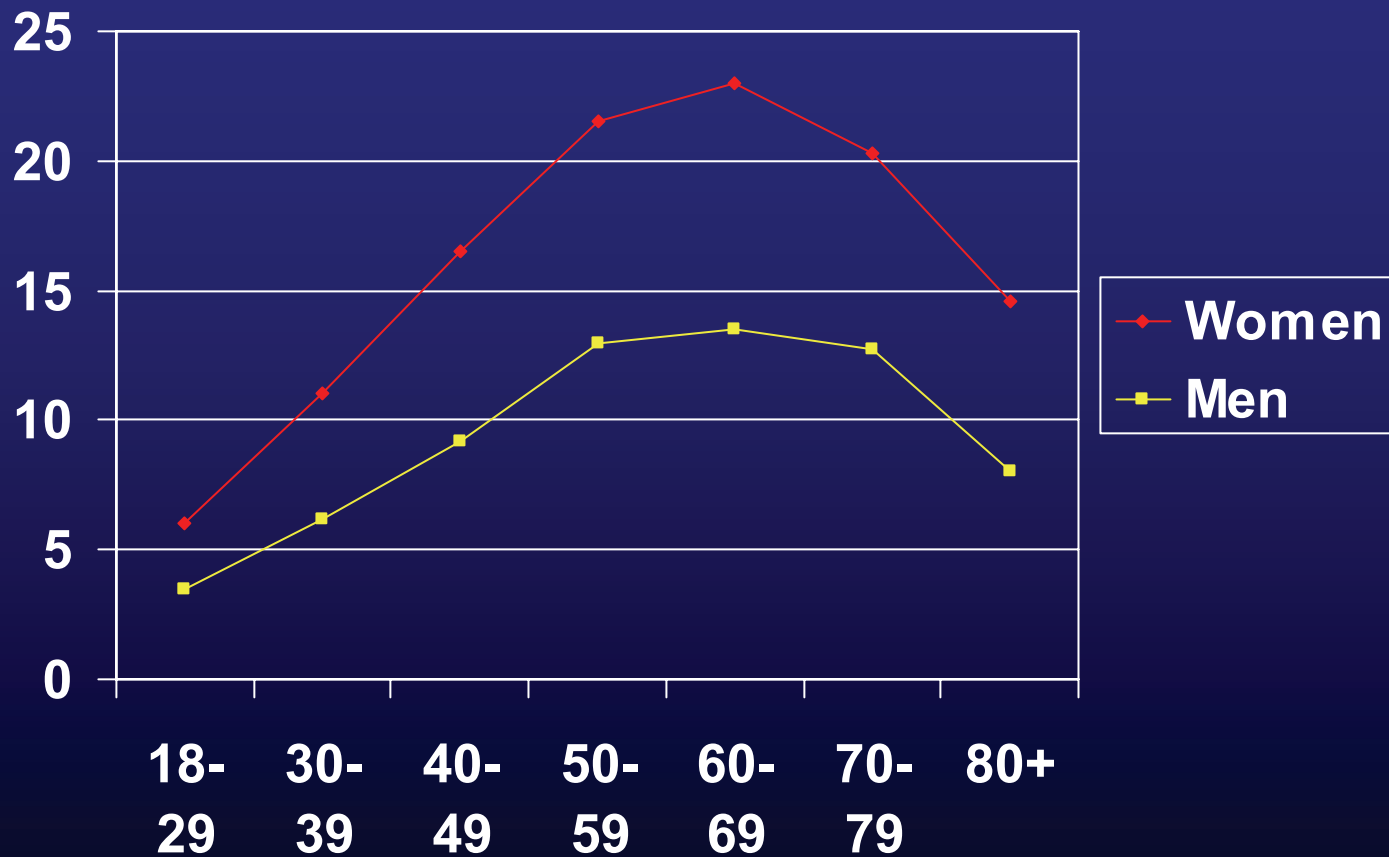
ACR Definition of Widespread Pain

All of the following must be present:

Pain in the left side of body, right side of body, above the waist, below the waist. In addition, axial skeletal pain (back or chest) must be present.



Percent of population with widespread pain, 3006 survey respondents, Wichita, KS

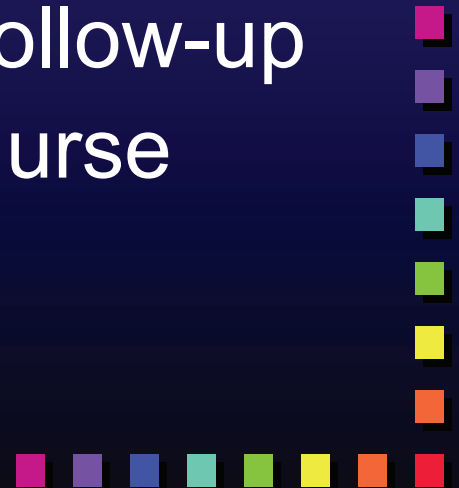


Women's Health & Aging Study

Participants: 1002 women aged 65-101,
from East Baltimore Area

Eligibility: Difficulty in ≥ 2 of 4 domains
of functioning; MMSE ≥ 18

Design: 3-year Longitudinal Follow-up
In-Home Interviews and Nurse
Exams every 6 months

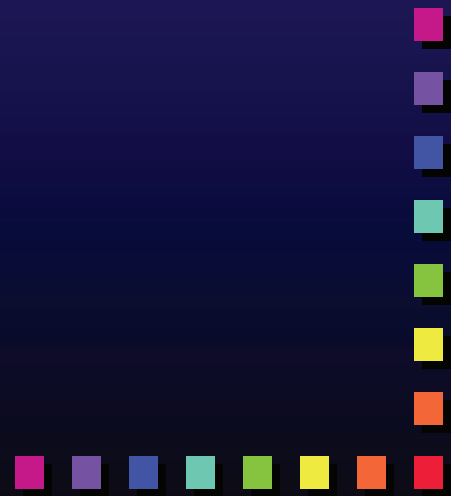
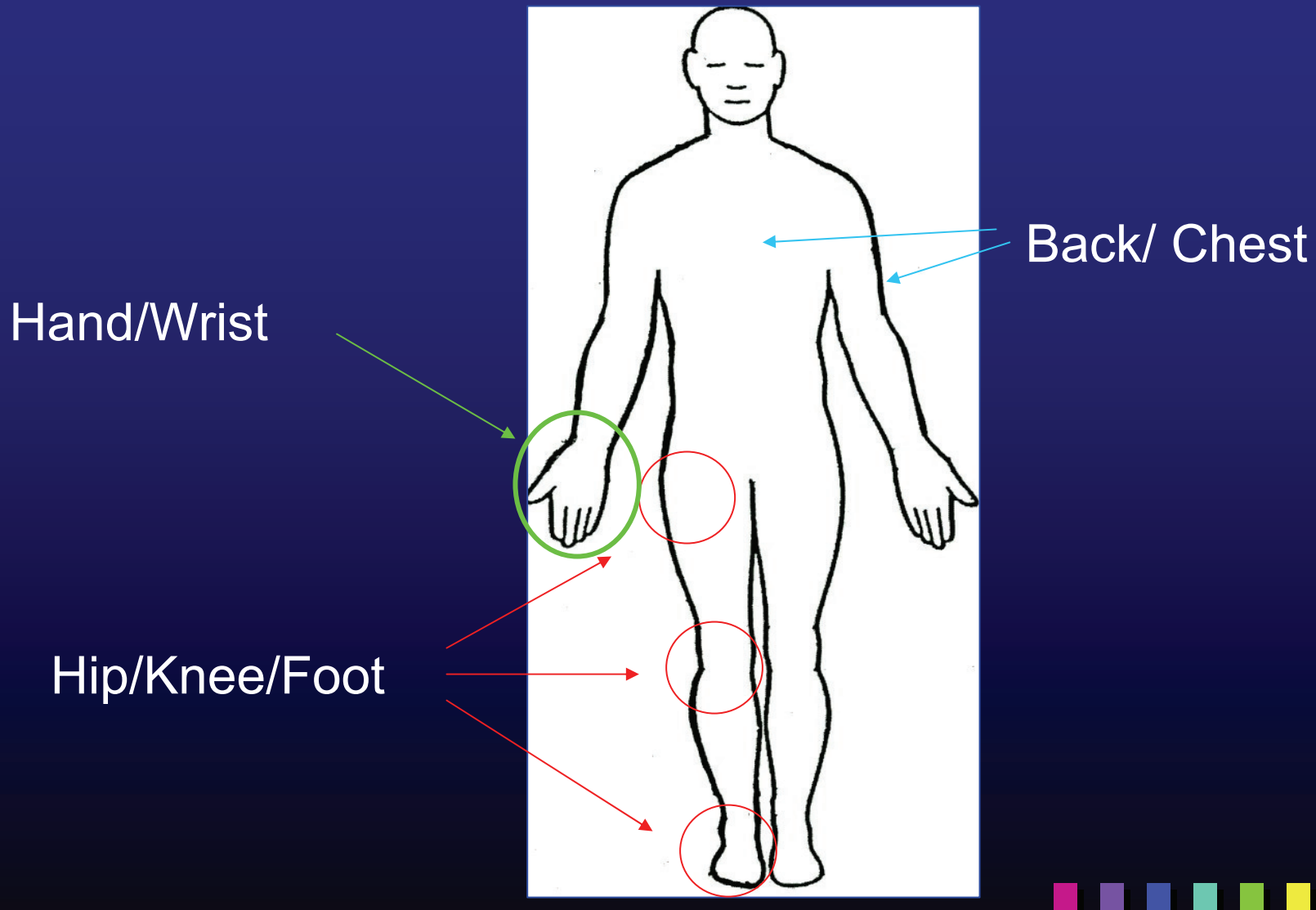


WHAS Baseline Pain Findings

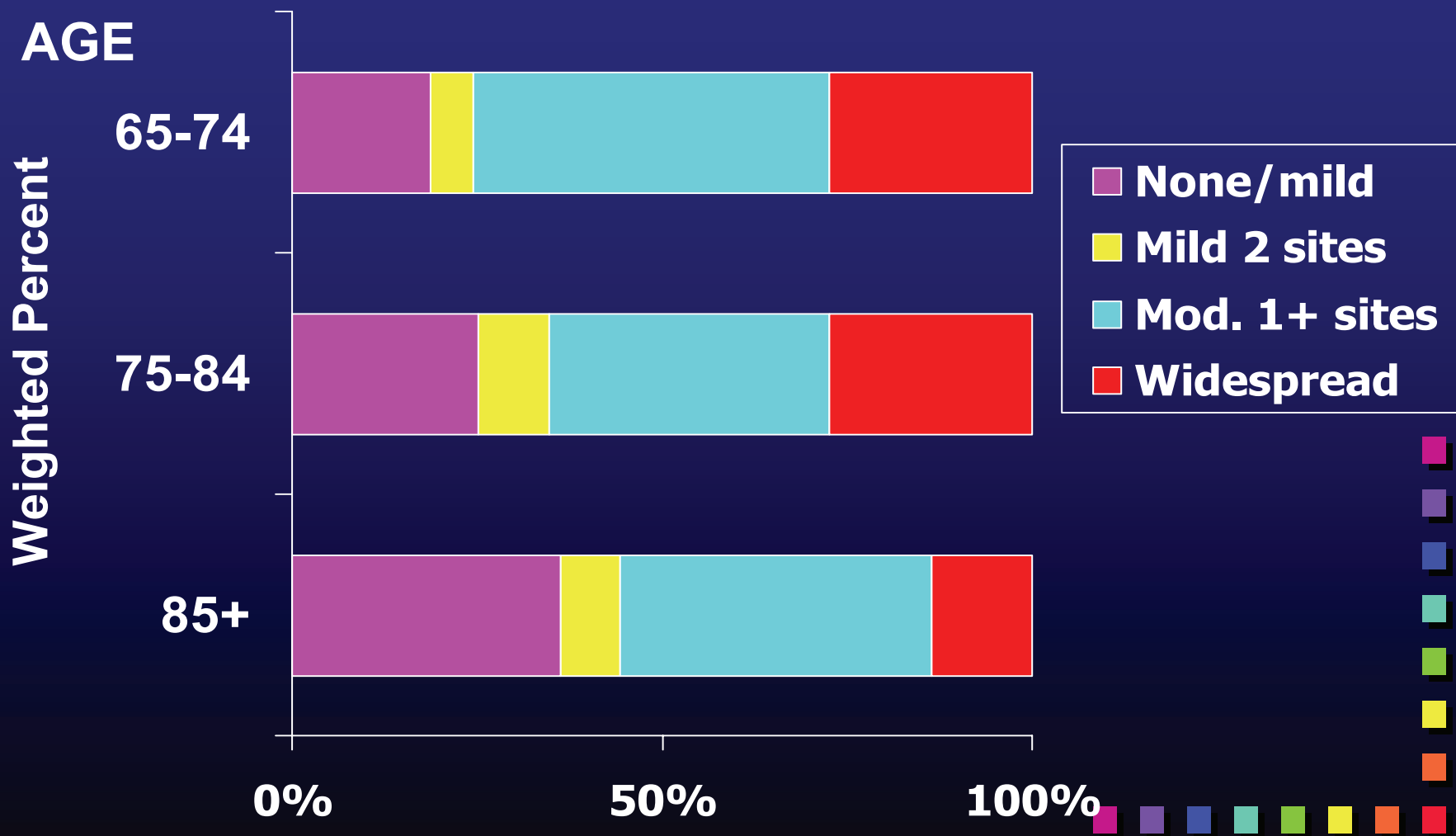
- 75% reported having pain on most days for at least 1 month in past year
- Women who had pain, often had pain in several sites
- Pain in specific sites associated with severe difficulty with daily activity



Widespread Musculoskeletal Pain:



Prevalence of musculoskeletal pain according to age in disabled older women



Classifying Pain Severity:

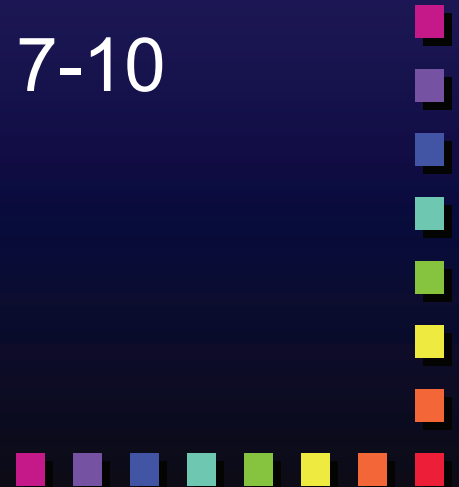
Categories: Widespread pain
Lower extremity mod./ severe
Other MSK pain
No pain

Visual Analog Scale (0 – 10)

Mild: 1-3, Moderate: 4-6, Severe: 7-10

Exclusions:

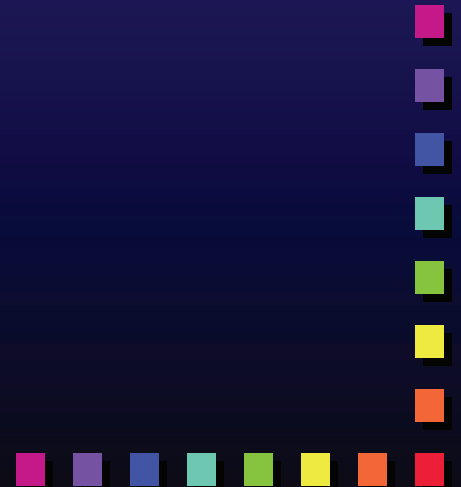
Anginal chest pain, Cancer pain



Assessment of Falls:

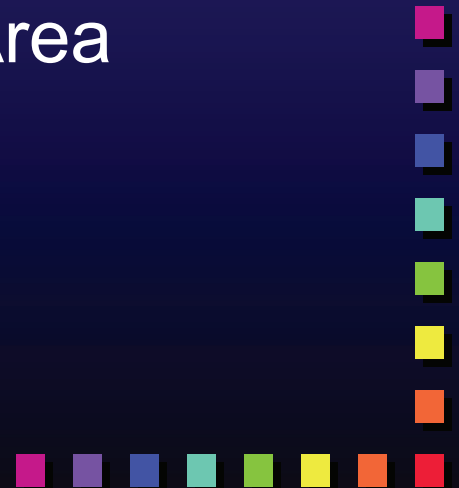
Number of falls reported in home interview every 6 mos. x 3 yrs

Recurrent falls: 2+ falls in 6 months

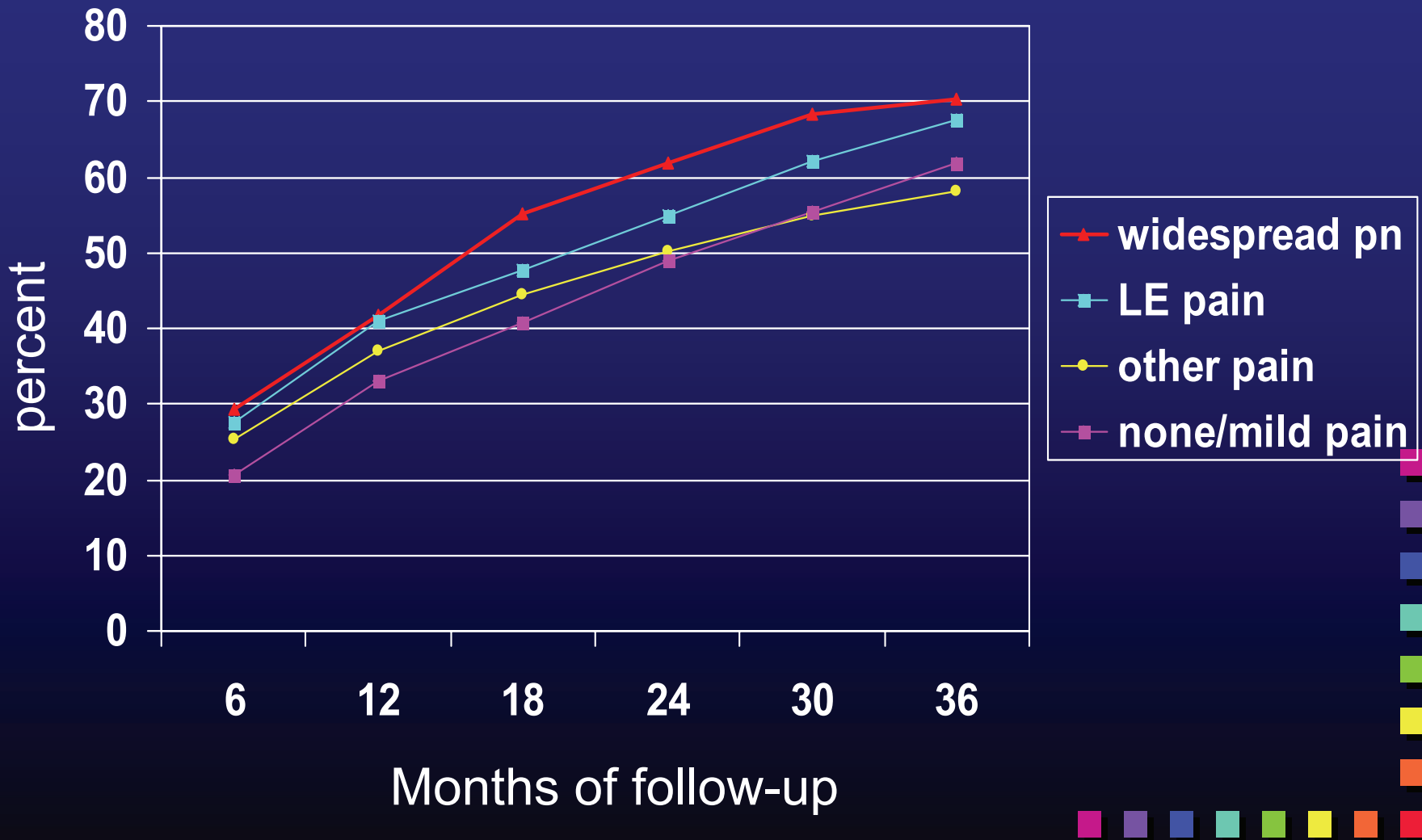


Pain Constellations (revised):

1. None or Mild Pain in 1 Joint Area
2. Other Pain
3. Moderate or Severe Lower Extremity Pain
4. Widespread Pain: in 3 Skeletal Regions with Moderate Pain in ≥ 1 Joint Area



Cumulative percentage of women who fell during follow-up by pain category

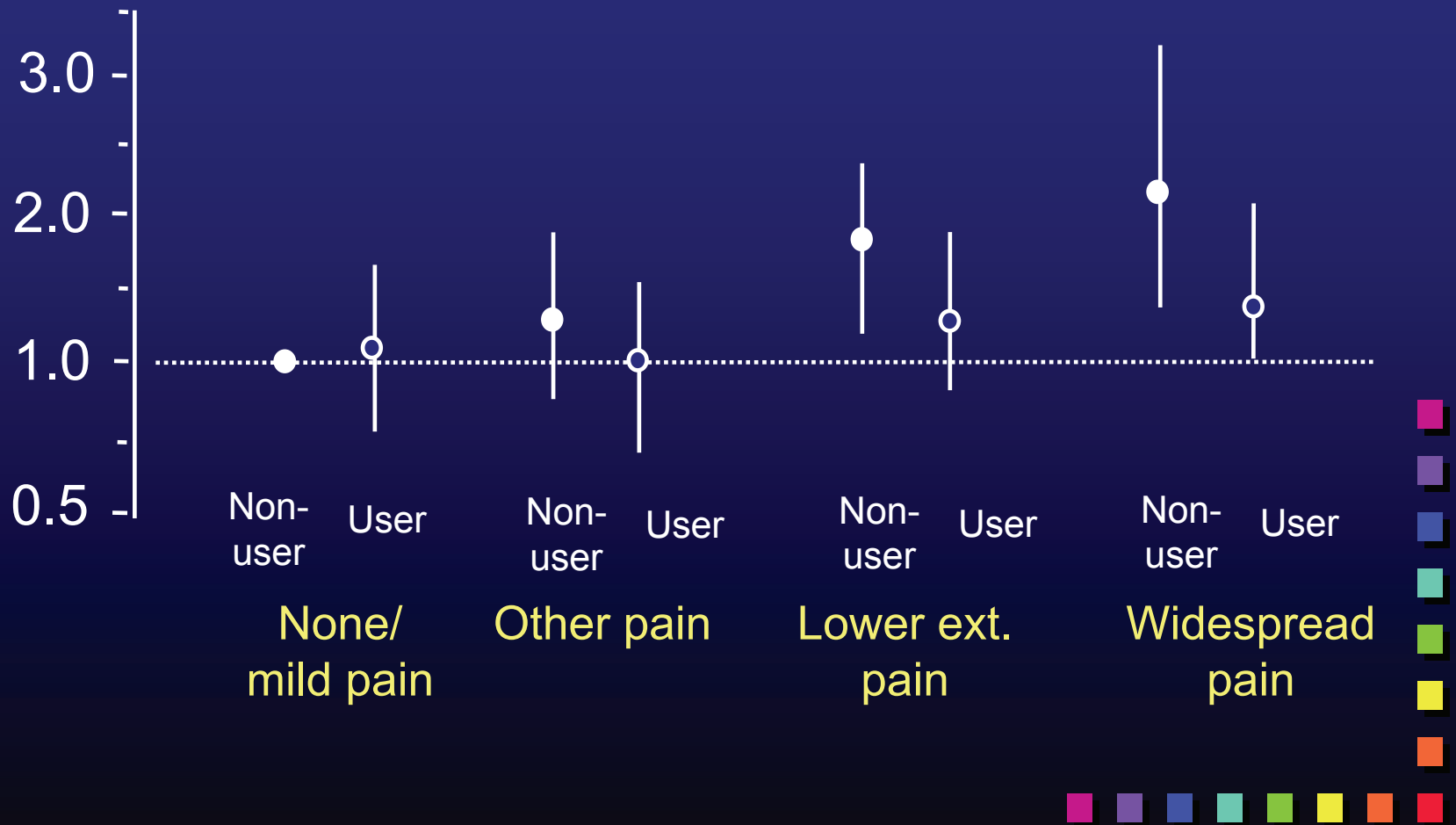


Risk for falls according to baseline pain

	Any falls <u>OR (95% C.I.)</u>	Recurrent falls <u>OR (95% C.I.)</u>
No pain	1.0	1.0
Other pain	1.4 (1.0-1.8)	1.5 (1.0 - 2.4)
LE pain	1.3 (0.97-1.7)	1.4 (0.9 - 2.0)
Widespread	1.7 (1.3-2.2)	1.7 (1.1 - 2.5)

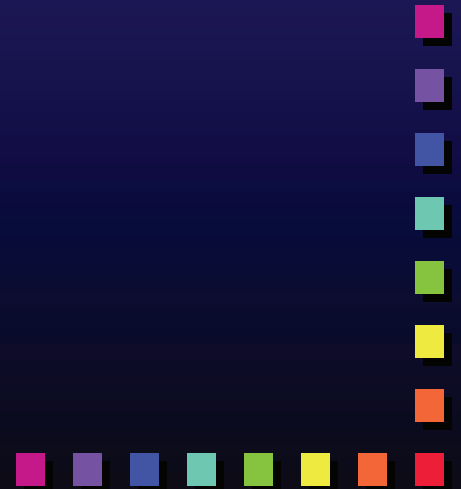
* Survival analysis models adj. for age, race, fair/ poor health, education, BMI, chronic diseases, prior falls, MMSE, meds, gait speed, balance

Risk for falls according to pain category and daily use of analgesic medications



Next Steps...

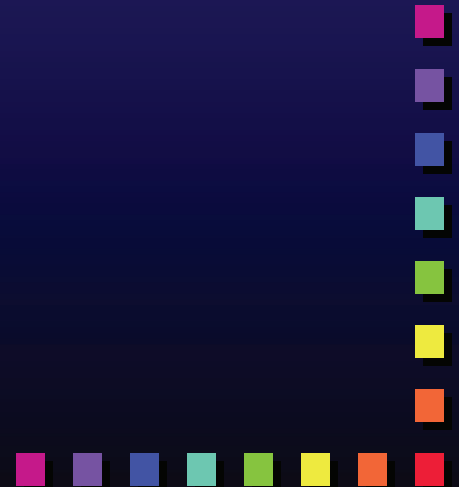
To study pain as a risk factor for falls in the general population of older adults...



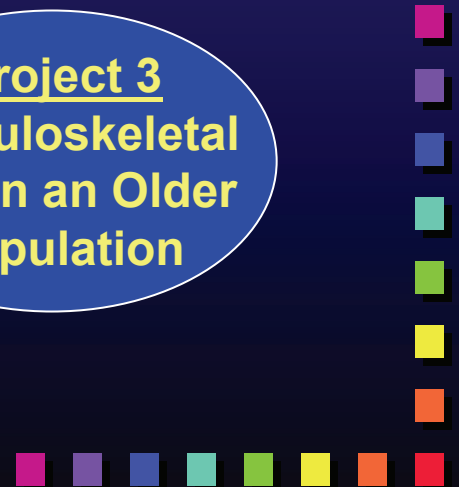
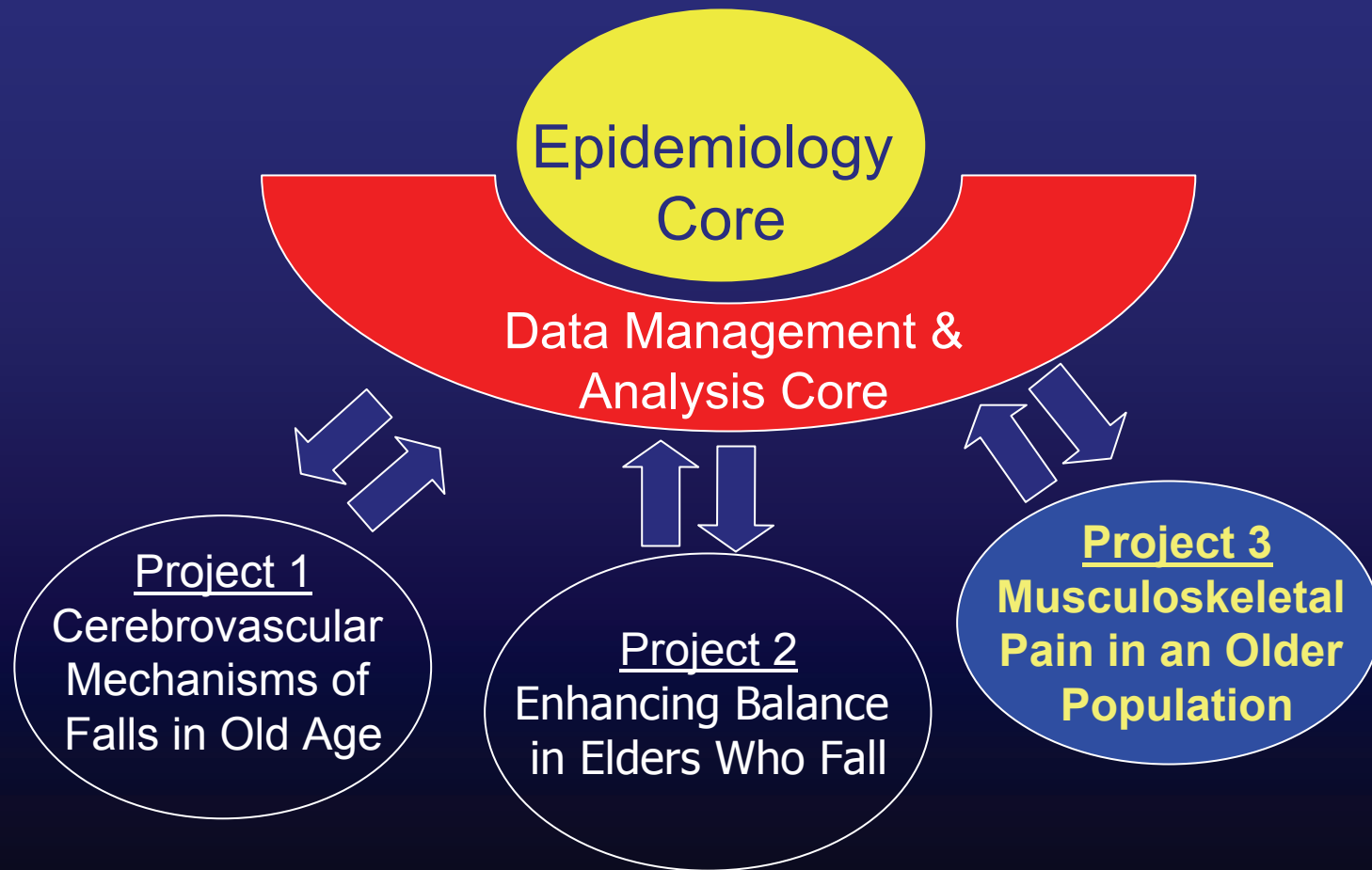
MOBILIZE Boston Study (MBS)

PI: Lewis Lipsitz, M.D.

Maintenance of Balance, Independent
Living, Intellect, and Zest in the
Elderly of Boston



MOBILIZE Boston Study



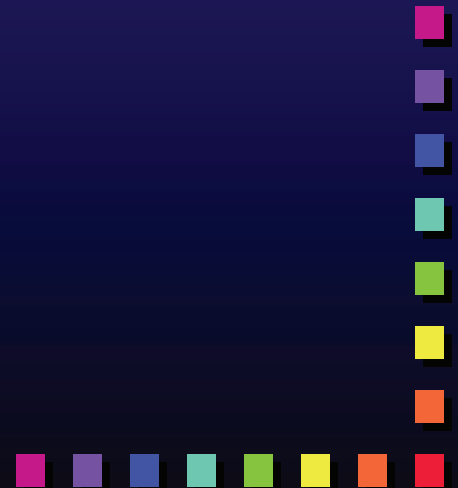
Cohort Eligibility Criteria

Inclusion

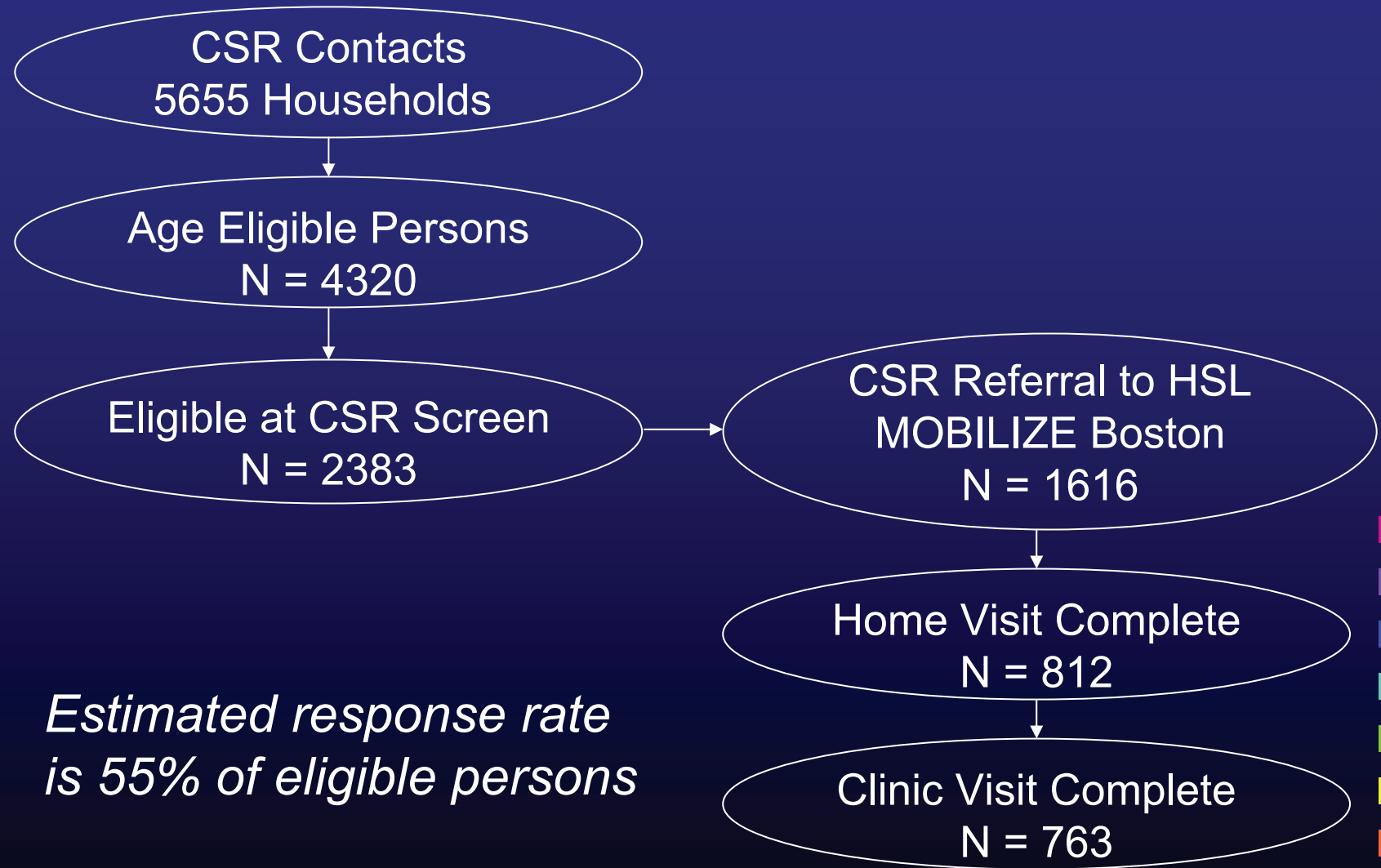
- Age >70 years
- Able to understand and communicate in English
- Plans to be in area next two years
- Able to walk 20 feet with or without walker

Exclusion

- Terminal disease
- Mini mental status score <18



Recruitment and Enrollment as of Jan. 2008



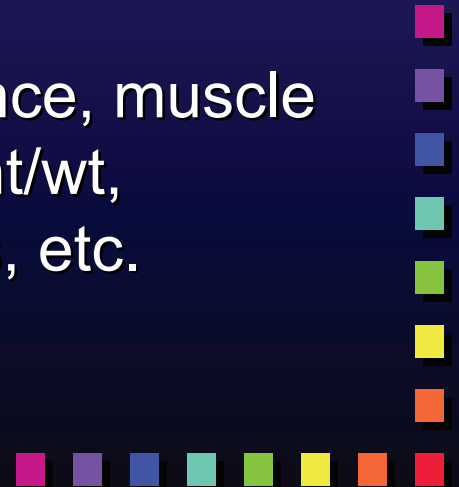
*Estimated response rate
is 55% of eligible persons*

CSR= Center for Survey Research
HSL= Hebrew Senior Life



Data Collection

- Baseline and 18-month home and clinic visits
- Monthly falls calendar postcards
- Measurement of pain, physical disability, depression, diseases, medications, pain management, cognitive function, social support, and home environment
- Nurse exam includes physical performance, muscle strength, musculoskeletal assessment, ht/wt, phlebotomy, transcranial doppler studies, etc.



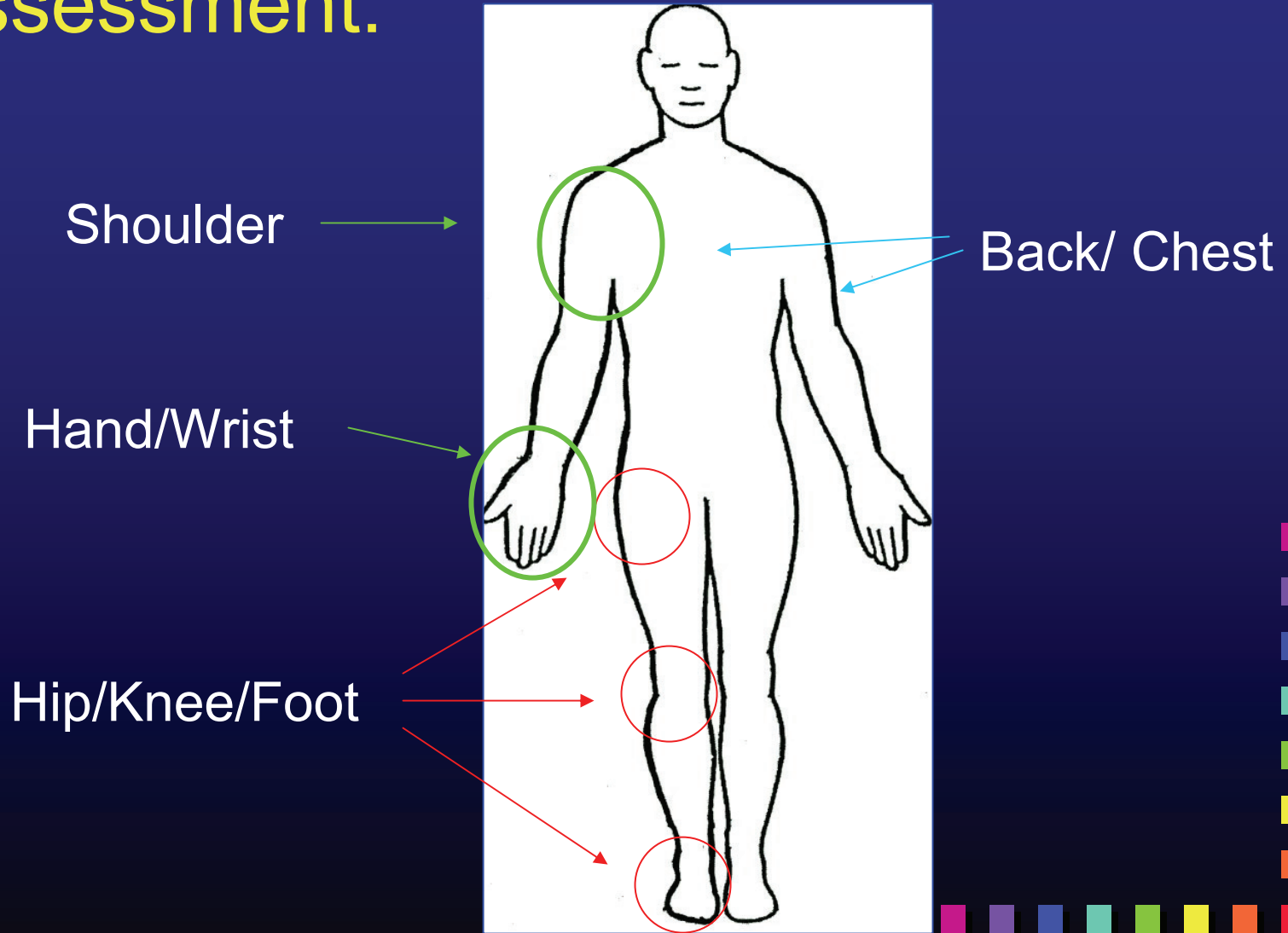
Monthly Falls Ascertainment

DEFINITION: Any event in which an individual falls down and comes to rest on a floor or other surface

- Calendar diary - postcard
- Phone questionnaire for each fall event
- Telephone follow up for non-returned calendar diaries

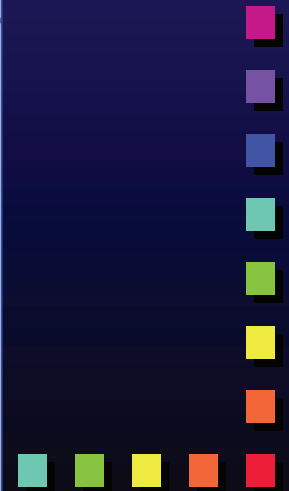
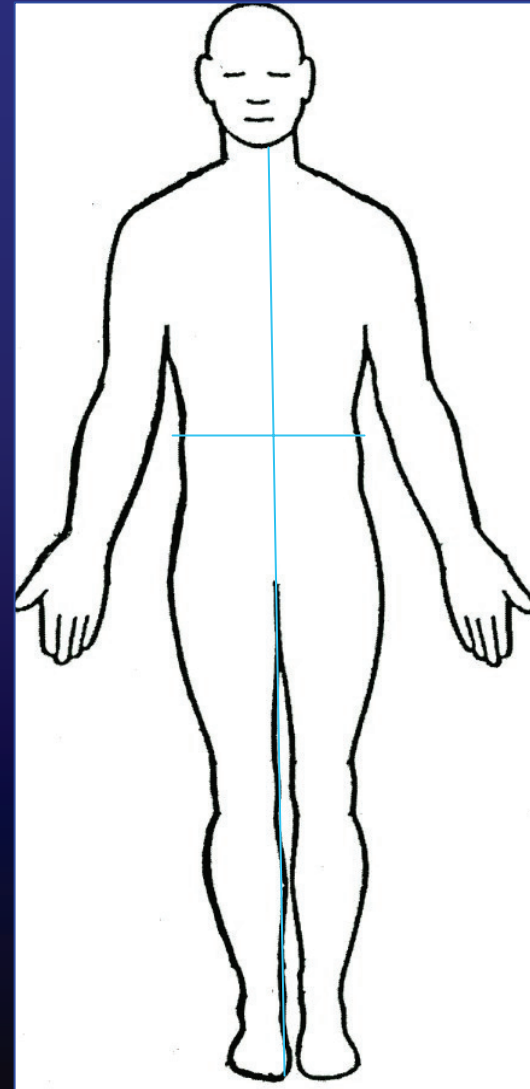


WHAS Musculoskeletal Joint Pain Assessment:



Widespread Musculoskeletal Pain: McGill Pain Map

ACR Definition of Widespread Pain:
Pain in the left side of body, right
side of body, above the waist, below
the waist; and axial skeletal pain
(back or chest).



Brief Pain Inventory: Severity Subscale

“I am going to ask you about pain that you have today that you have experienced for more than just a week or 2.”

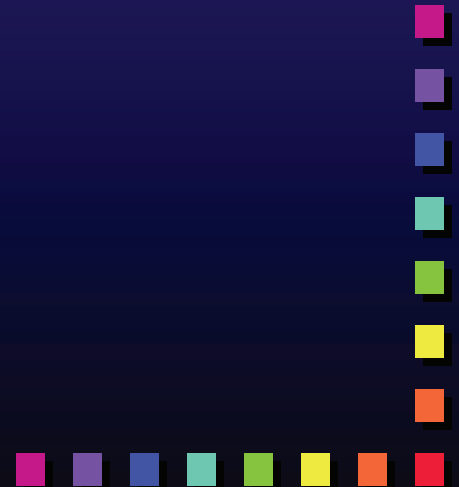
Sum of Pain Ratings, 0 -10:

Pain at its worst in the last week

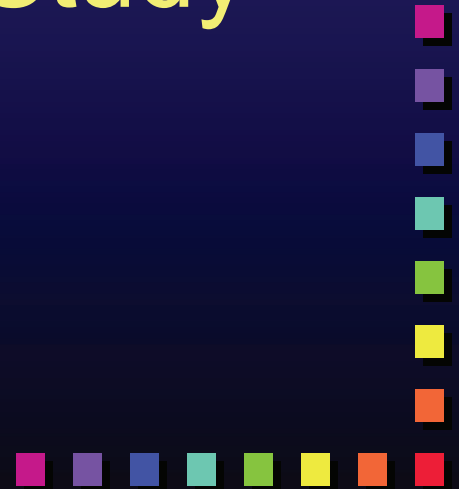
Pain at its least

Pain on average

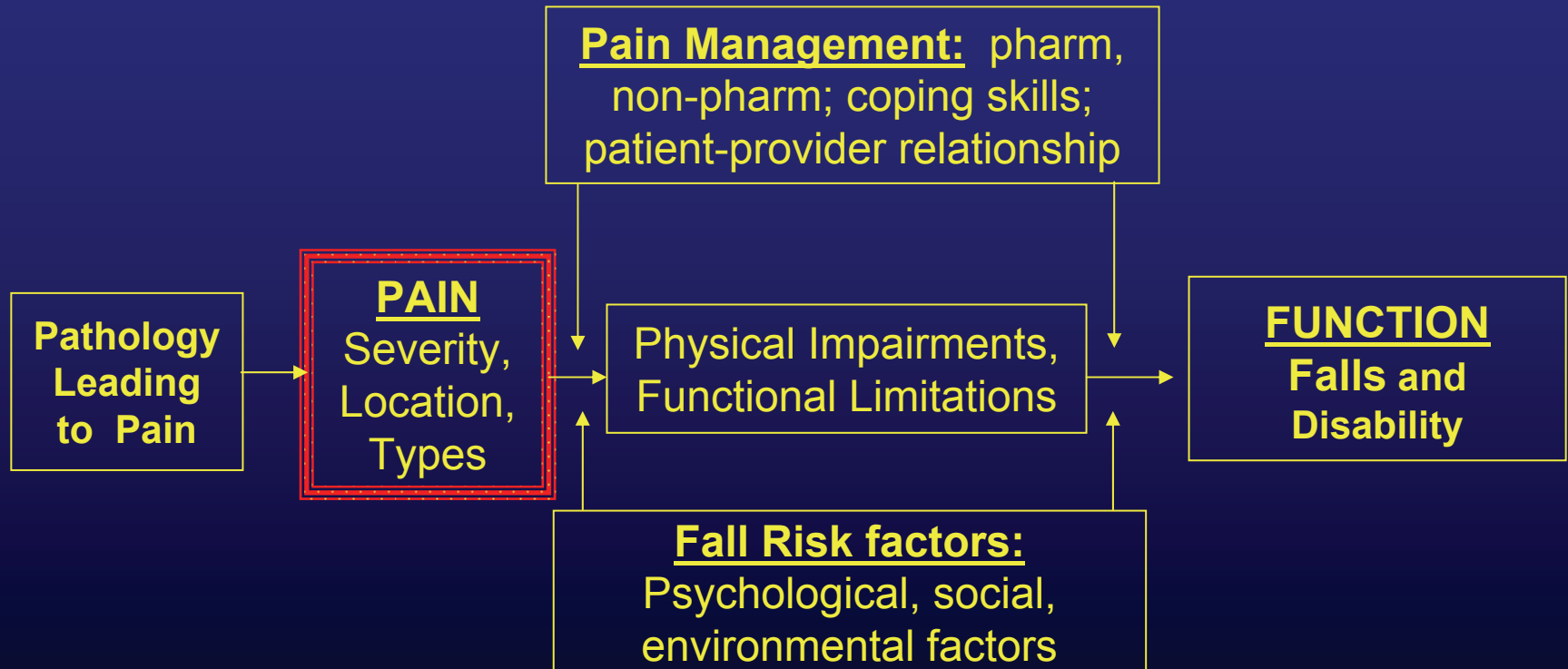
Pain now



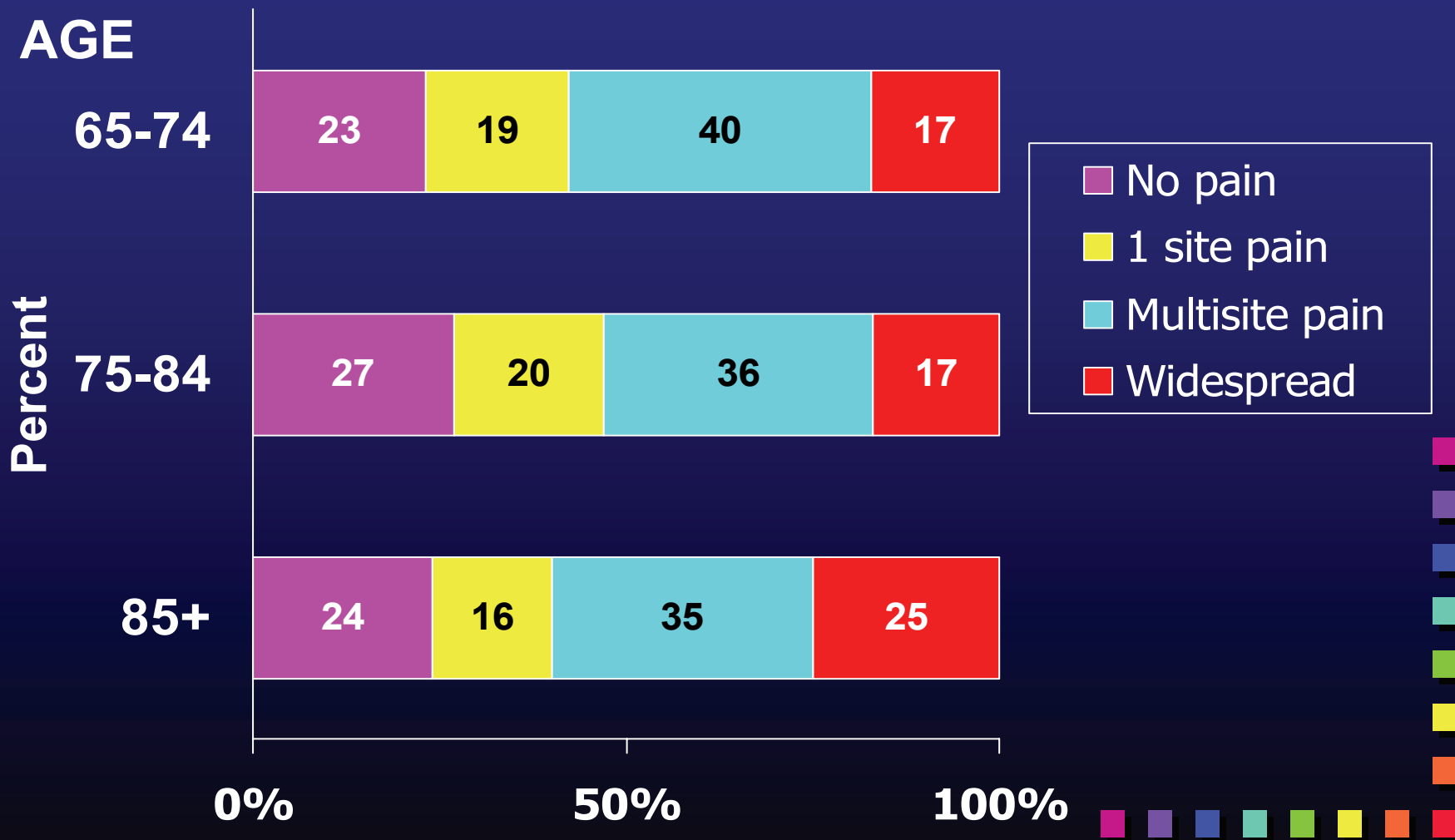
Preliminary Data:
The First Year of Follow-up
The MOBILIZE Boston Study



Conceptual Model of Pain as a Cause of Falls and Disability



Prevalence of pain according to age group, MBS first 600 participants



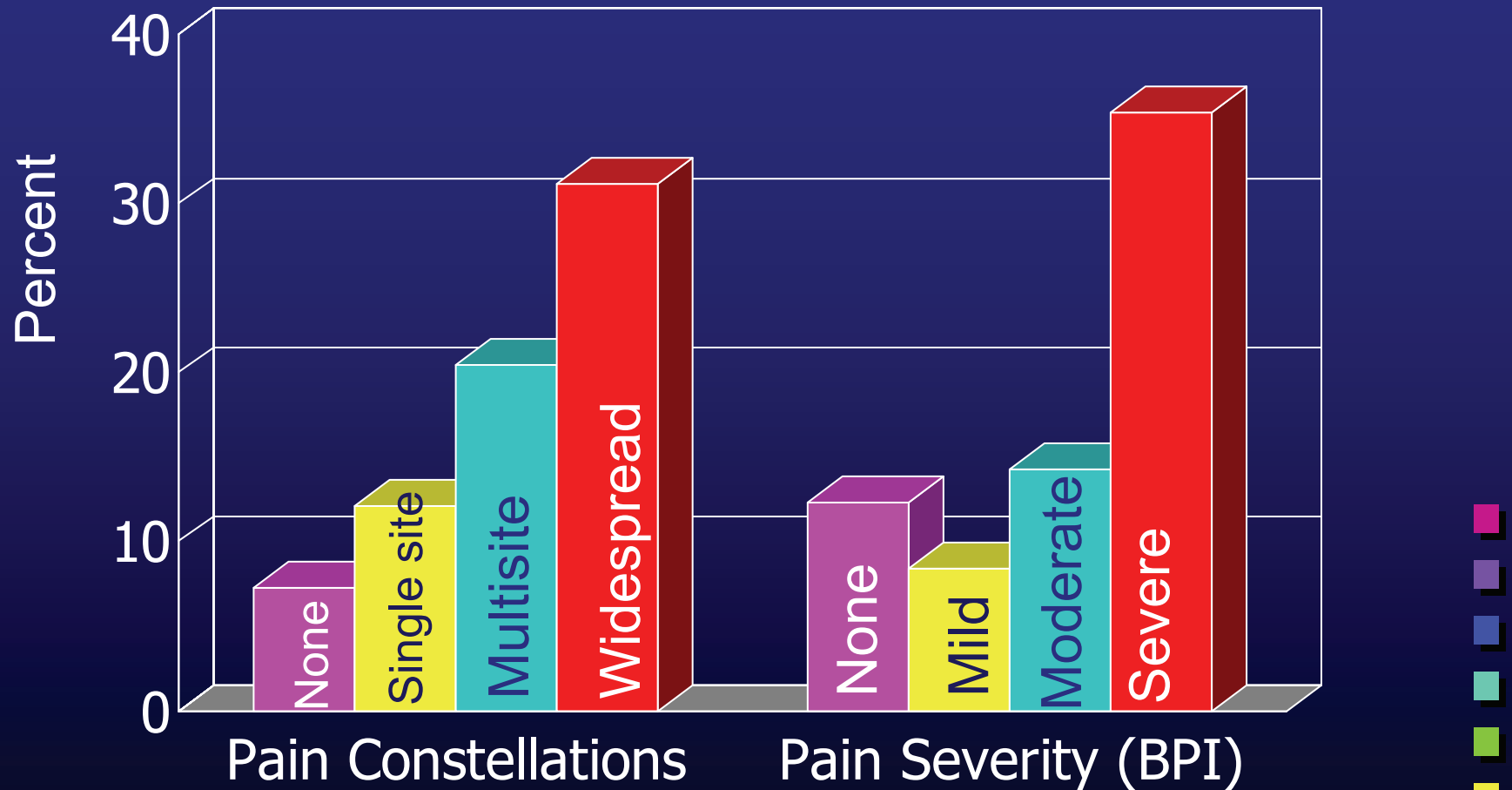
Baseline demographics according to pain categories, first 600 participants, MOBILIZE Boston Study

	No Pain N=151	Single site pain N=116	Multisite pain N=224	Widespread pain N=109
Female %	58	60	67	71*
White %	79	80	78	73
Black	17	15	16	20
Other	4	5	6	7
<H.S. educ %	7	8	11	20
≥H.S. educ	41	44	47	43
Coll. Grad.	52	48	42	37*

*chi-square test for trend (1 d.f.), $p < 0.05$



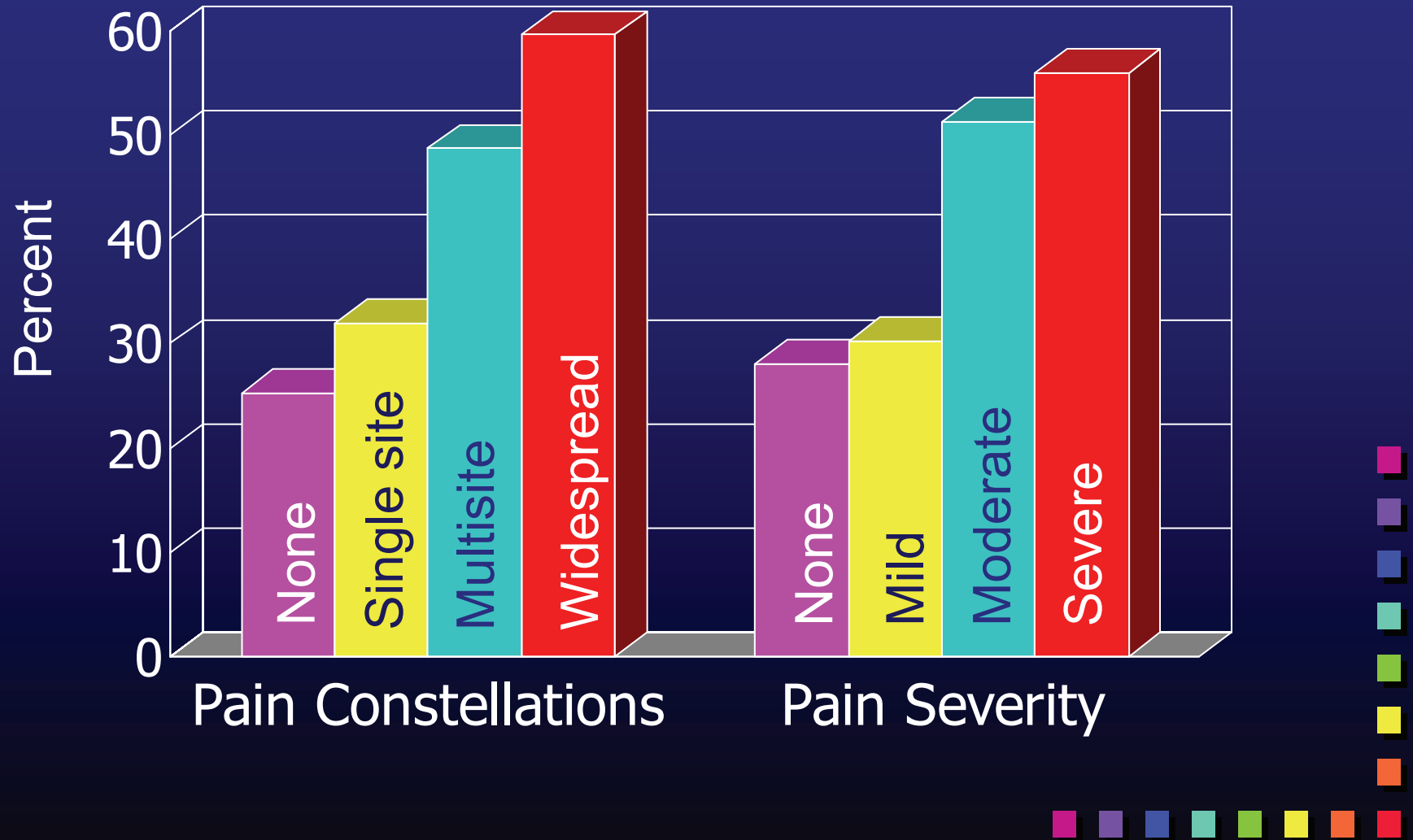
Severe mobility difficulty* according to pain groups, first 600 participants, MOBILIZE Boston Study



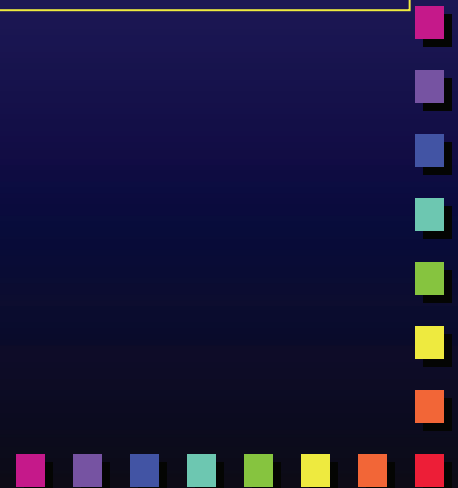
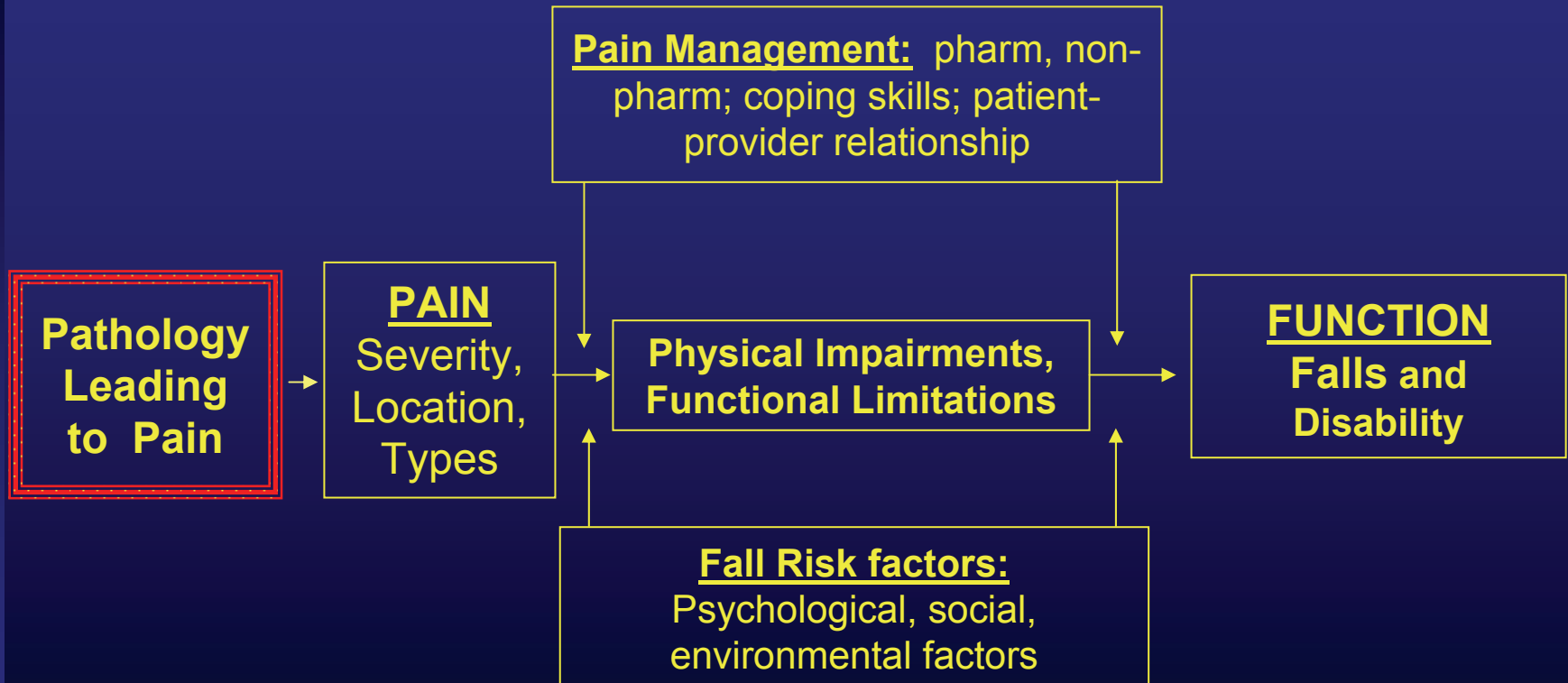
* A lot of difficulty or inability to walk ¼ mile or climb stairs



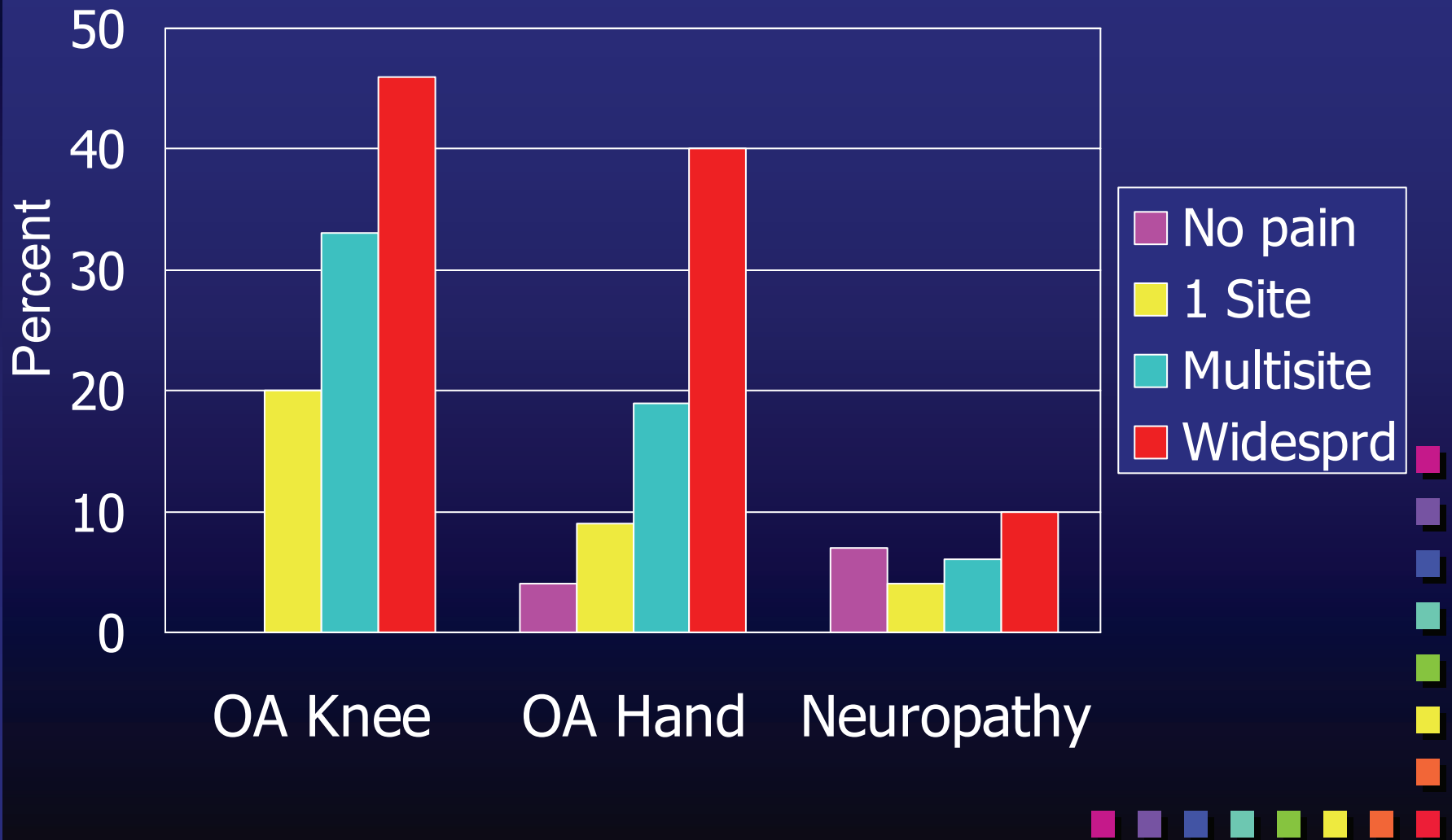
Any IADL difficulty according to pain groups, first 600 participants, MOBILIZE Boston Study



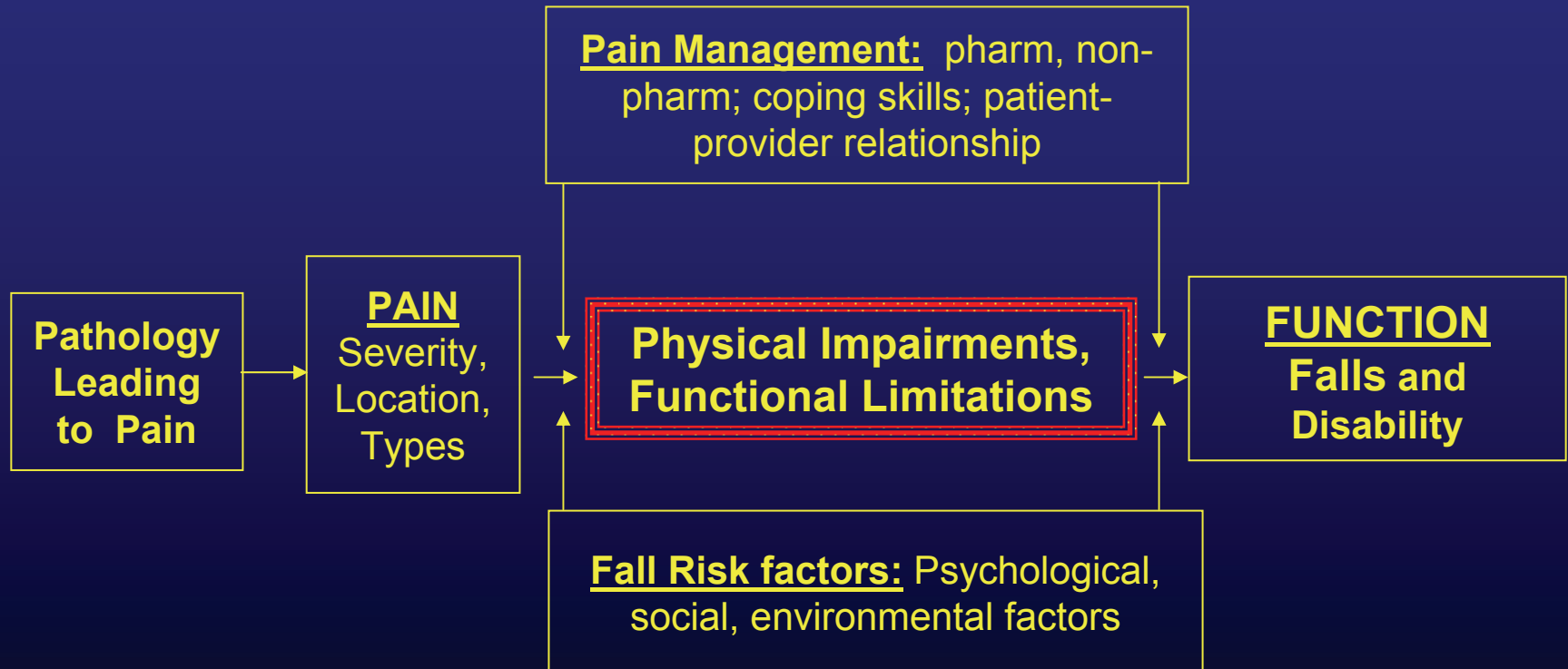
Conceptual Model of Pain as a Cause of Falls and Disability



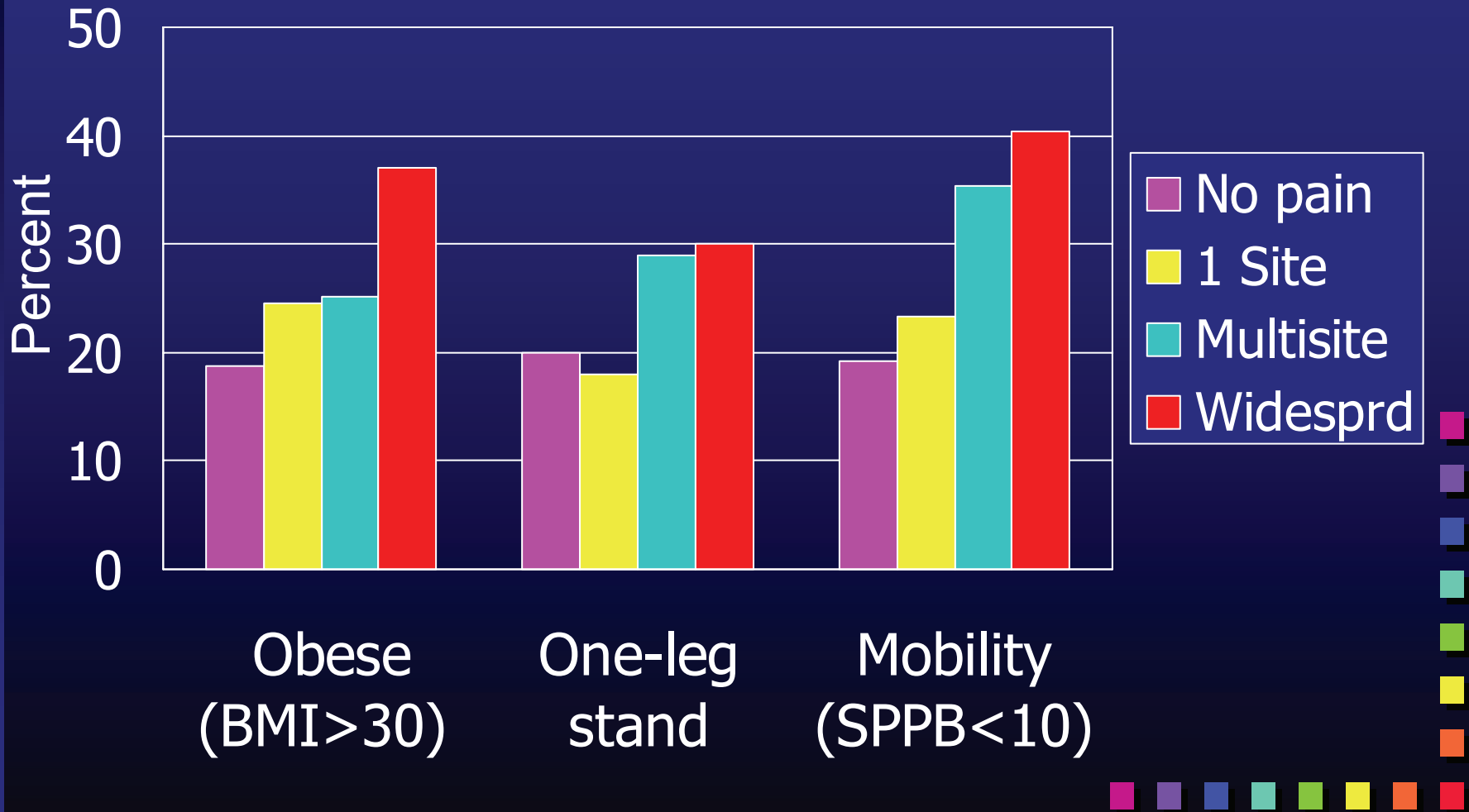
Pathological factors according to pain categories, first 600 participants, MOBILIZE Boston Study



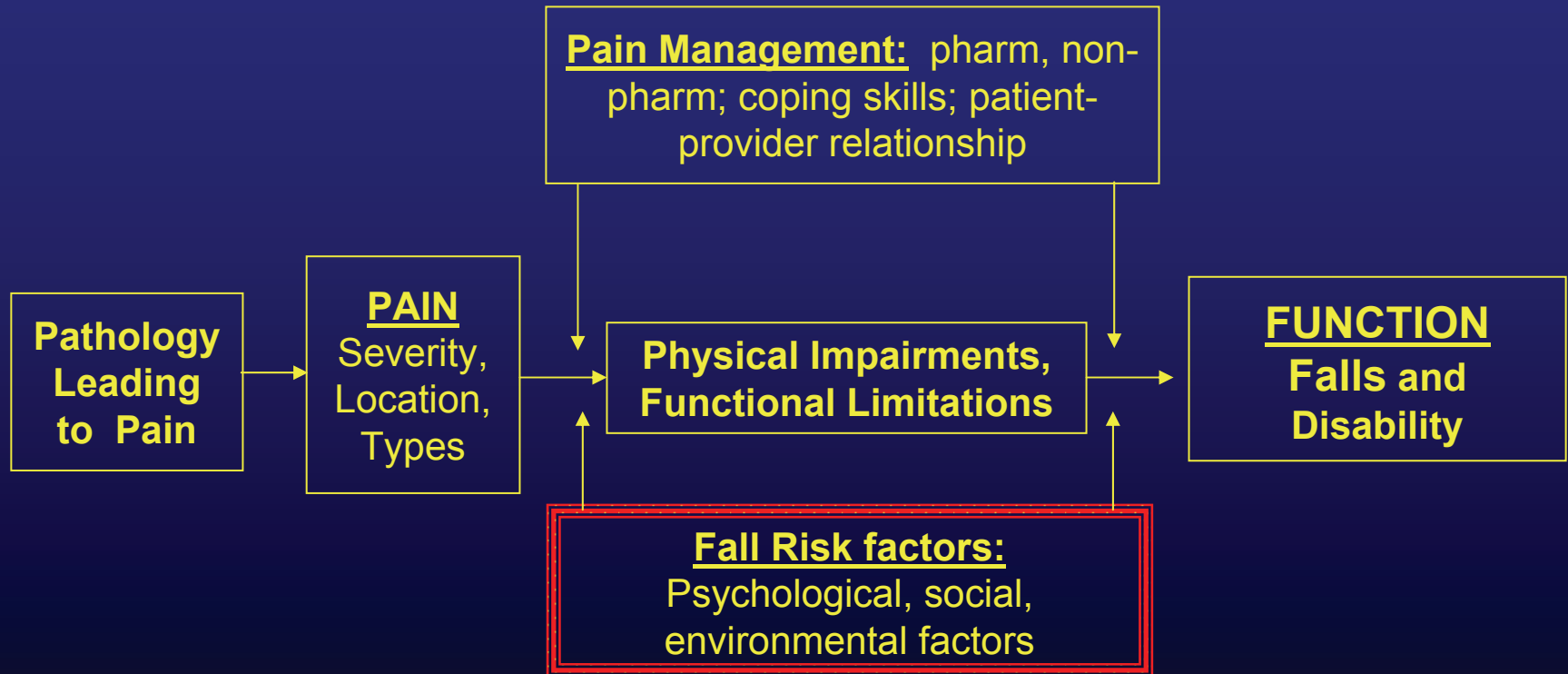
Conceptual Model of Pain as a Cause of Falls and Disability



Physical impairments and functional limitations according to pain categories, first 600 participants, MOBILIZE Boston Study



Conceptual Model of Pain as a Cause of Falls and Disability



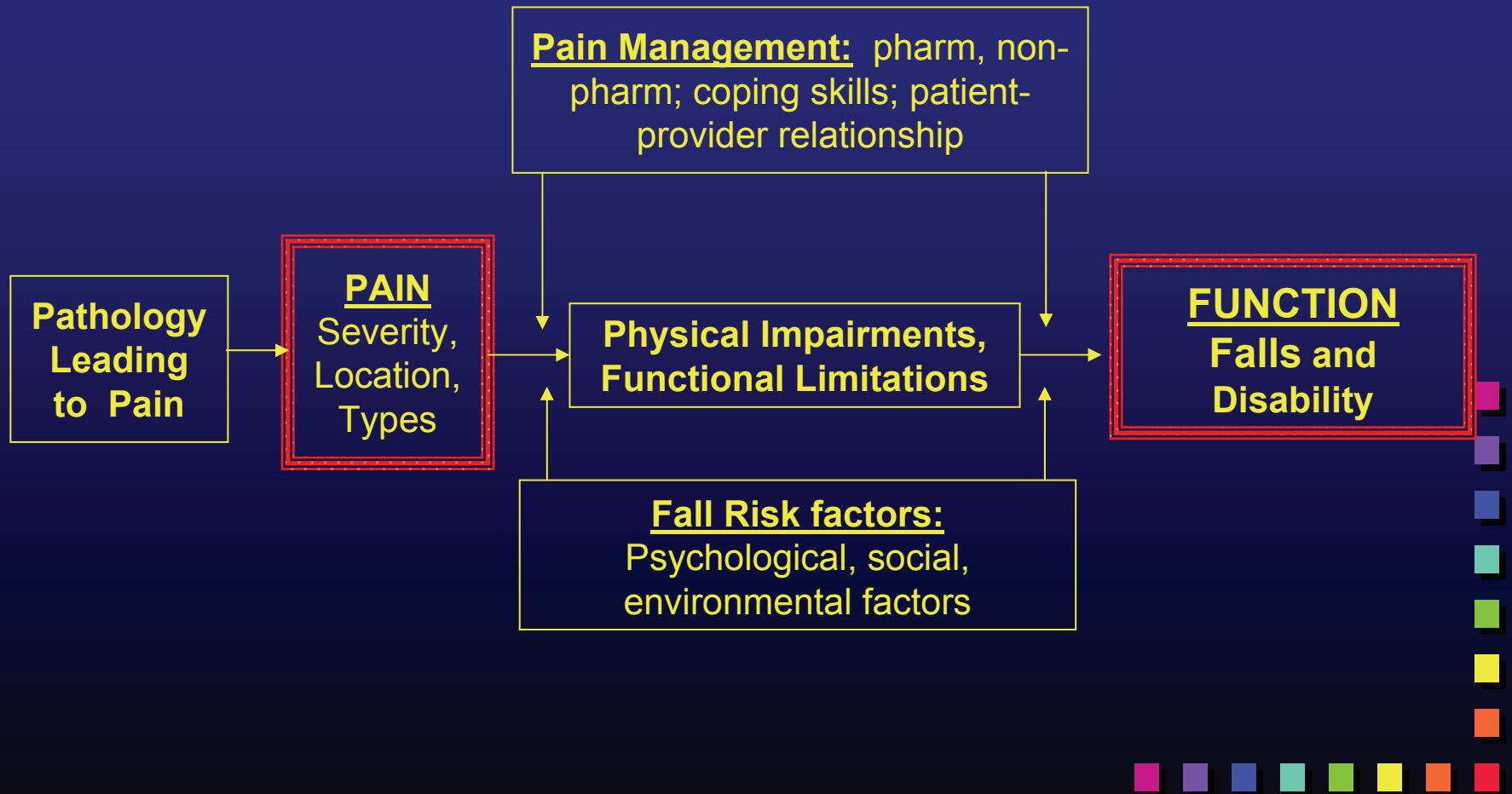
Fall risk factors according to pain categories, first 600 participants, MOBILIZE Boston Study

	No Pain	Single site	Multisite	Wide-spread
	Percent			
> 1 Fall in past year	7	18	20	23*
Low falls self-efficacy (Tinetti)	10	7	16	20*
Walks < 1 mile/wk	38	37	54	56*
Anxiety (HADS>7)	11	14	17	25*
Depression (CESD)	5	2	12	8*
Vision deficit	28	19	24	35

* Chi-square test for trend (1d.f.)



Conceptual Model of Pain as a Cause of Falls and Disability



Hazard ratios for time to first fall according to baseline pain category in first year of follow-up, first 600 participants, MOBILIZE Boston Study

	Model 1 RR (95% C.I.)	Model 2 RR (95% C.I.)	Model 3 RR (95% C.I.)
No pain	1.0	1.0	1.0
Single site	1.3 (0.9-2.1)	1.4 (0.9 - 2.1)	1.2 (0.7-1.9)
Multisite	1.9 (1.3-2.7)	1.9 (1.3 - 2.8)	1.8 (1.2-2.6)
Widespread	1.8 (1.2-2.8)	1.9 (1.2 – 3.0)	1.8 (1.1-2.9)

Cox Proportional Hazards models:

Model 1: adj. age, sex, race, education

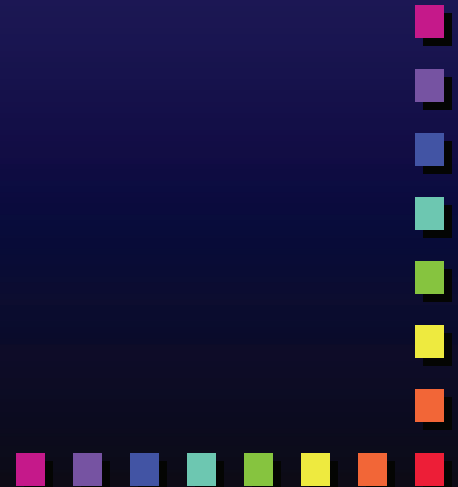
Model 2: + OA knee and hand

Model 3: + fall risk factors, SPPB



Summary of Preliminary Findings: MOBILIZE Boston Study

- ❖ Multisite or widespread pain increases the risk for falls in older adults.
- ❖ Findings suggest proposed mediators in our conceptual model do not explain the association between pain and falls



Many thanks to the MOBILIZE Boston Study Investigators and Staff:

Lewis A. Lipsitz, M.D.

Douglas P. Kiel, M.D., M.P.H.

Suzanne G. Leveille, Ph.D.

Richard N. Jones, Sc.D.

Anthony Roman, M.A.

Adrienne Cupples, Ph.D.

James Collins, Ph.D.

Attila Priplata, Ph.D.

Farzaneh Sorond, M.D., Ph.D.

Hyun Gu Kang, Ph.D.

Elizabeth J. Samelson, Ph.D.

Marian T. Hannan, D.Sc.

Margaret Gagnon, M.S.N.

Marcie Freeman, M.Ed.

William Milberg, Ph.D.

Jonathan Bean, M.D., M.S.

Robert Shmerling, M.D.

Joseph Audette, M.D.

And the many research staff members who have contributed to the recruitment, enrollment, and data collection and management of the MBS

