

Musculoskeletal Pain After Stroke - Implications for Rehabilitation Programs

Adrian Melnic

Nicolae Testemițanu State University of Medicine and Pharmacy
Department of Medical Rehabilitation, Physical Medicine and Manual Therapy
Chișinău, Republic of Moldova

Disclosure statement

I have no actual or potential conflict of interest in relation to this presentation.

Why does musculoskeletal pain matter?

- Post-stroke pain is common, often under-recognized, and may become chronic.
- In rehabilitation settings, musculoskeletal pain is frequently the dominant pain phenotype.
- It reduces mobility, exercise tolerance, sleep quality, mood, and health-related quality of life.
- If not addressed early, pain limits participation and may slow functional recovery.



Pain after Stroke

Patients who experience pain after stroke seem to be more inclined to lower levels of health-related quality of life (HrQoL) [3], worse cognitive and functional performance, higher fatigue perception, post-stroke depression, anxiety symptoms, and suicidality.[1]

Despite its severe burden, pain is often under-diagnosed and under-treated in post-stroke survivors [4], and its clinical consequences are still inadequately understood. This may be due to the difficulties patients with aphasia, neglect syndrome, or dementia have when describing their pain experience or to the clinicians' abilities to analyse pain and treat it. [1]

TYPES OF PAIN

DURATION

- Acute
- Chronic

CAUSE

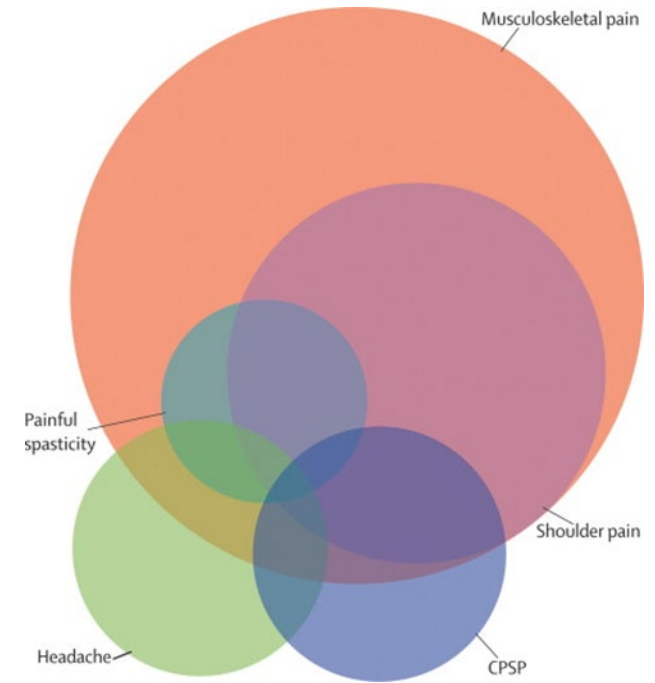
- Nociceptive
- Neuropathic
- Mixed
- Somato-visceral

COURSE

- Continuous
- Intermittent
- Incident
- Irruptive

INTENSITY

- Mild
- Moderate
- Severe

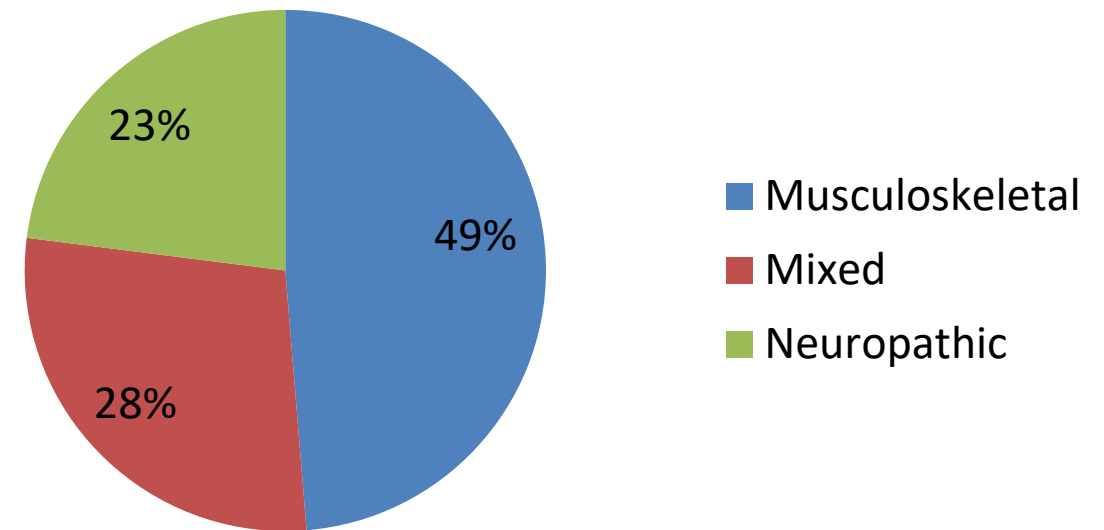


Klit, H., Finnerup, N. B., & Jensen, T. S. (2009). Central post-stroke pain: clinical characteristics, pathophysiology, and management. In *The Lancet Neurology* (Vol. 8, Issue 9, pp. 857–868). Elsevier BV. [https://doi.org/10.1016/s1474-4422\(09\)70176-0](https://doi.org/10.1016/s1474-4422(09)70176-0)

Local rehabilitation cohort: pain burden

- Analysis of 270 stroke patients enrolled in rehabilitation.
- About two thirds reported pain; chronic pain was present in 42.2%.
- Musculoskeletal pain was the most frequent chronic pain type.
- Chronic pain phenotype distribution is shown on the right.

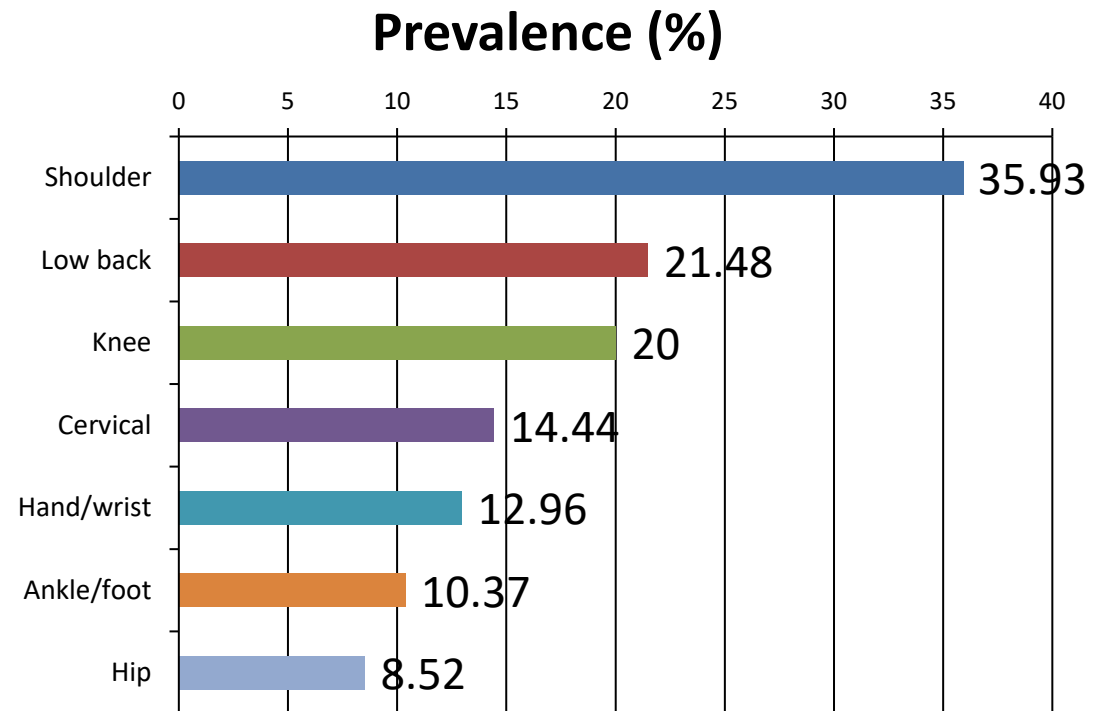
Chronic pain phenotype distribution



Local rehabilitation presentation data (n = 270).

Where is musculoskeletal pain located?

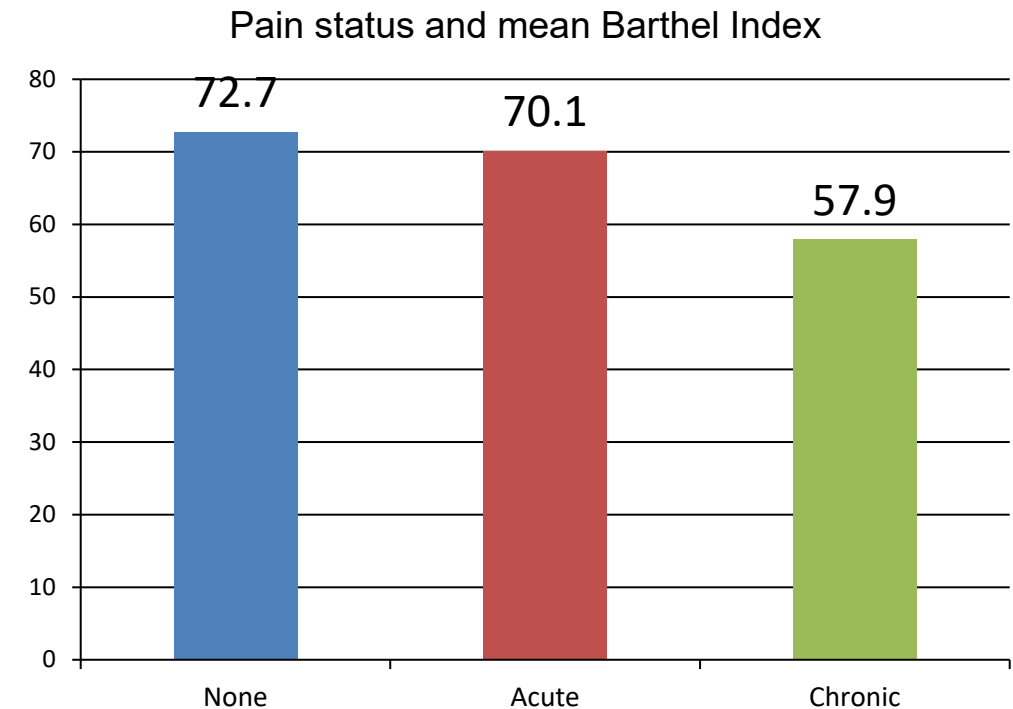
- Shoulder pain was the most frequent site, followed by low back and knee pain.
- Multiple painful regions may coexist and complicate therapy planning.
- Assessment should extend beyond the paretic upper limb and include spine, lower limbs, and gait-related overload.



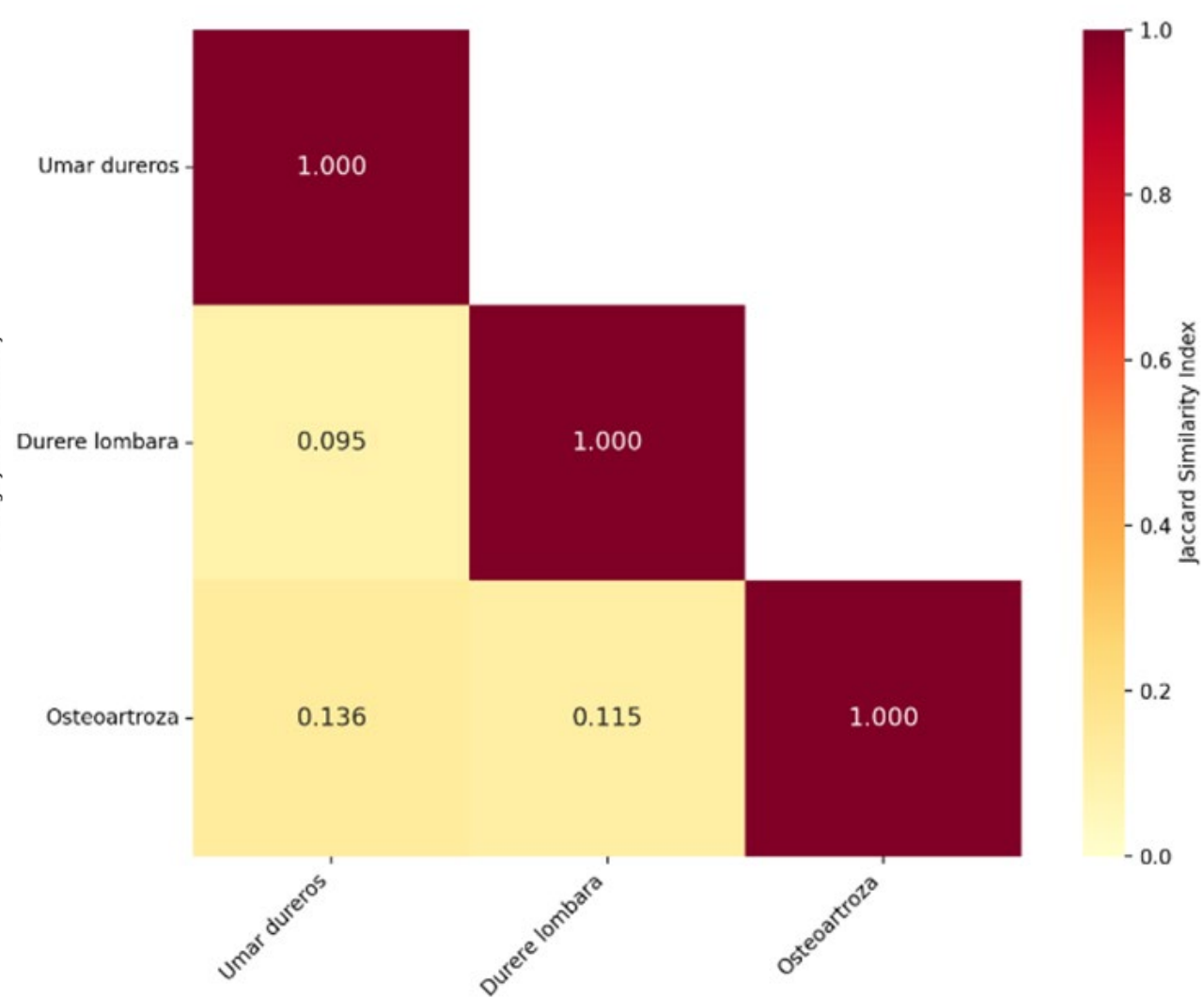
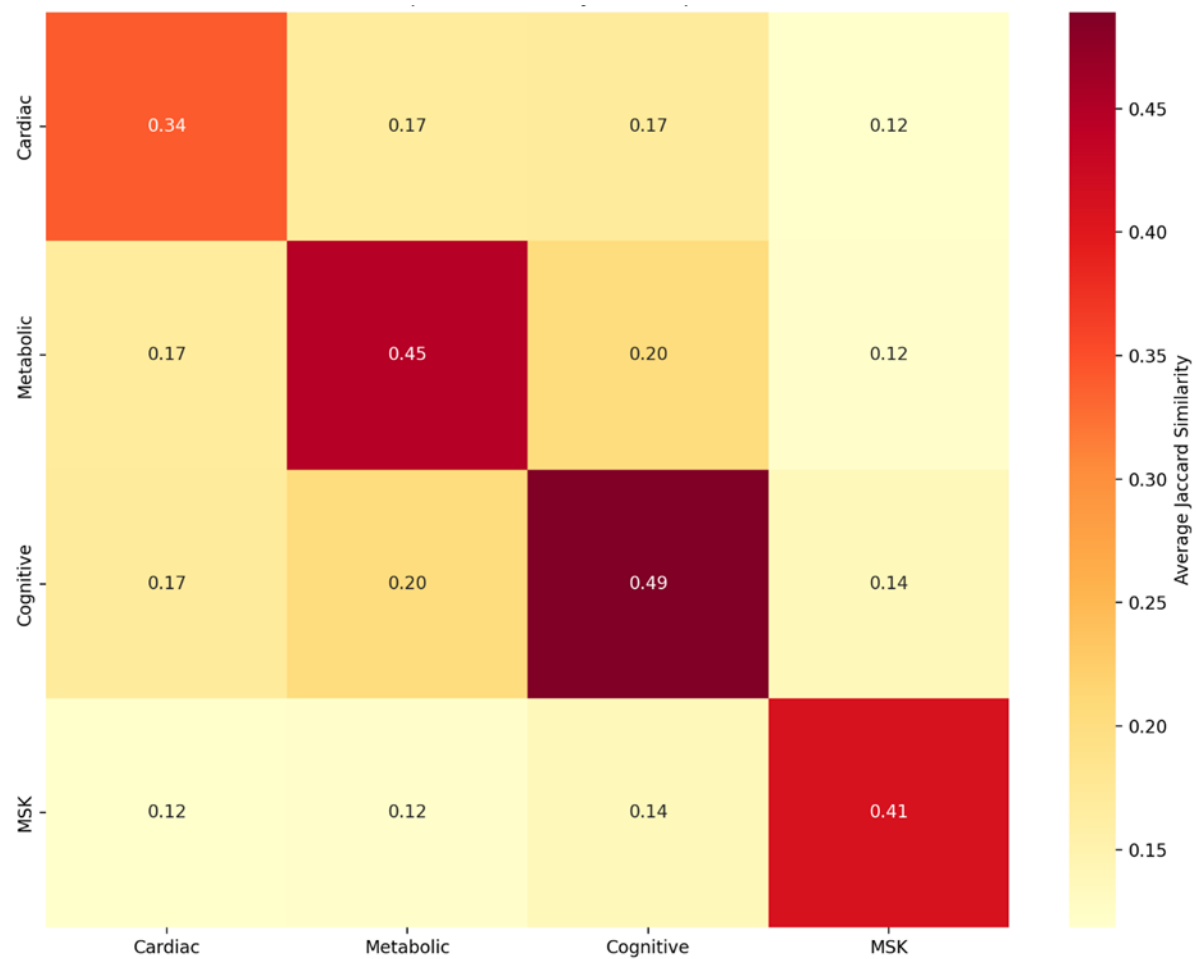
Nordic Musculoskeletal Questionnaire distribution in the local cohort.

Functional impact on independence

- Mean Barthel Index was lower in patients with pain than in those without pain (61.4 vs 72.5).
- By pain status: none 72.7, acute 70.1, chronic 57.9.
- ANOVA showed a significant difference across pain groups: $F(2,267) = 11.218$, $p < .001$.
- Chronic pain is therefore a practical marker of lower ADL independence.



Local rehabilitation presentation data (n = 270).



Painful comorbidities cluster with depression

- In 382 post-stroke survivors, shoulder pain occurred in 17.3%, osteoarthritis in 15.4%, and low back pain in 9.9%.
- Direct overlap between musculoskeletal syndromes was modest.
- Associations with depression were stronger, especially for shoulder pain and osteoarthritis.
- Rehabilitation should therefore screen pain and mood together.

	LBP	SP	OA	DEP
LBP	1.000	0.095	0.136	0.135
SP	0.095	1.000	0.115	0.246
OA	0.136	0.115	1.000	0.196
DEP	0.135	0.246	0.196	1.000

LBP = low back pain | SP = shoulder pain | OA = osteoarthritis | DEP = depression

Jaccard with depression: shoulder 0.246 | OA 0.196 | low back 0.135

Poster data on painful comorbidities and depression (n = 382).

Implications for rehabilitation programs

Assessment at admission

- Identify pain phenotype: musculoskeletal, neuropathic, or mixed; record site, duration, severity, and aggravating movement.
- Screen associated drivers: restricted range of motion, spasticity, subluxation, posture, gait asymmetry, mood, sleep, and fatigue.

Implications for rehabilitation programs

Program design

- Use shoulder protection, positioning, scapular control, ROM work, and graded strengthening when upper-limb pain is present.
- Address spinal and lower-limb overload with gait retraining, load modification, therapeutic exercise, assistive devices, and osteoarthritis self-management.
- Combine physical treatment with medication review, education, and psychological support when pain coexists with depression.

A practical pathway for stroke rehabilitation teams

1

Screen pain at admission
Use site, intensity, duration, and movement triggers.

2

Classify the pain phenotype
Musculoskeletal vs neuropathic vs mixed.

3

Target modifiable drivers
ROM loss, posture, subluxation, gait overload, spasticity.

4

Integrate mood, sleep, and fatigue management when pain persists.

5

Track outcomes over time
Pain severity + Barthel + participation in therapy.

Goal: less pain, greater participation in therapy, and better functional independence.

Take-home messages

- Musculoskeletal pain is a frequent and clinically relevant consequence of stroke.
- Shoulder, low back, knee, and cervical pain are common and may coexist in the same patient.
- Chronic pain is associated with lower functional independence during rehabilitation.
- Painful syndromes also cluster with depression, supporting multidimensional assessment and care.
- Rehabilitation programs should integrate pain screening, physical treatment, education, and psychological support.

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