Effectiveness of Directional Preference to guide Management of Low Back Pain in Canadian Armed Forces Members: A pragmatic study

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Conflict of Interest Disclosure

- Relationships with commercial interests
  - Nil
- Teaching Faculty of McKenzie Institute Canada
  - Anja Franz, PT, Dip. MDT

Scope

- Background information
- Purpose & Objective
- Methods
- Statistical Analyses
- Results
- Conclusion

BACKGROUND

LBP in military populations

LBP a leading cause for:

- Medical & physiotherapy consultations
- Medical evacuations from an operational theatre
- Disability
- Chronicity
- Medical releases

(Cohen et al, 2012; Born et al, 2010; Rowe & Hébert, 2011; Feuerstein et al, 1997)

Management of LBP

Guidelines: directional preference (DP)

- Efficacy of DP-guided management
  - ✓ Research setting (ideal conditions)
  - ✓ General population (Delitto et al, 2012)

- Effectiveness of DP-guided management
  - ? Real-life clinical practice
  - ? Military personnel
    - Unique physical, psychological and occupational stresses

(Cohen et al, 2012)

OBJECTIVE

Objective

To determine, in real-life clinical practice, the effectiveness of DP-guided management vs usucal care (UC) physiotherapy in CAF members suffering from LBP

Hypotheses

DP-guided management more effective than usual care (UC) to:

1. ↓ pain and disability
2. ↓ work loss
3. ↓ health care utilization

METHODS

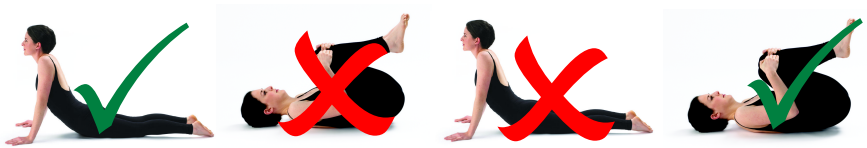
Methods

- **Design:** Pragmatic non-randomized trial
  - Follow-up at 1 month and 3 months
- **Population:** CAF members with LBP
- **Sample:** 44 consecutive CAF members presenting to the base physiotherapy clinic for LBP

TREATMENT GROUPS

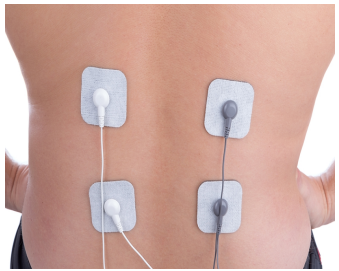
DP Group

- DP-guided management
  - Individualised



UC Group

- Usual care (Ø DP)
  - Individualised



Directional Preference (DP)

- Clinical criteria
- Repeated movements in one spinal direction
  - ↓ distal pain
  - ↑ lumbar range of motion (ROM)

(McKenzie & May, 2003)

Outcome measures

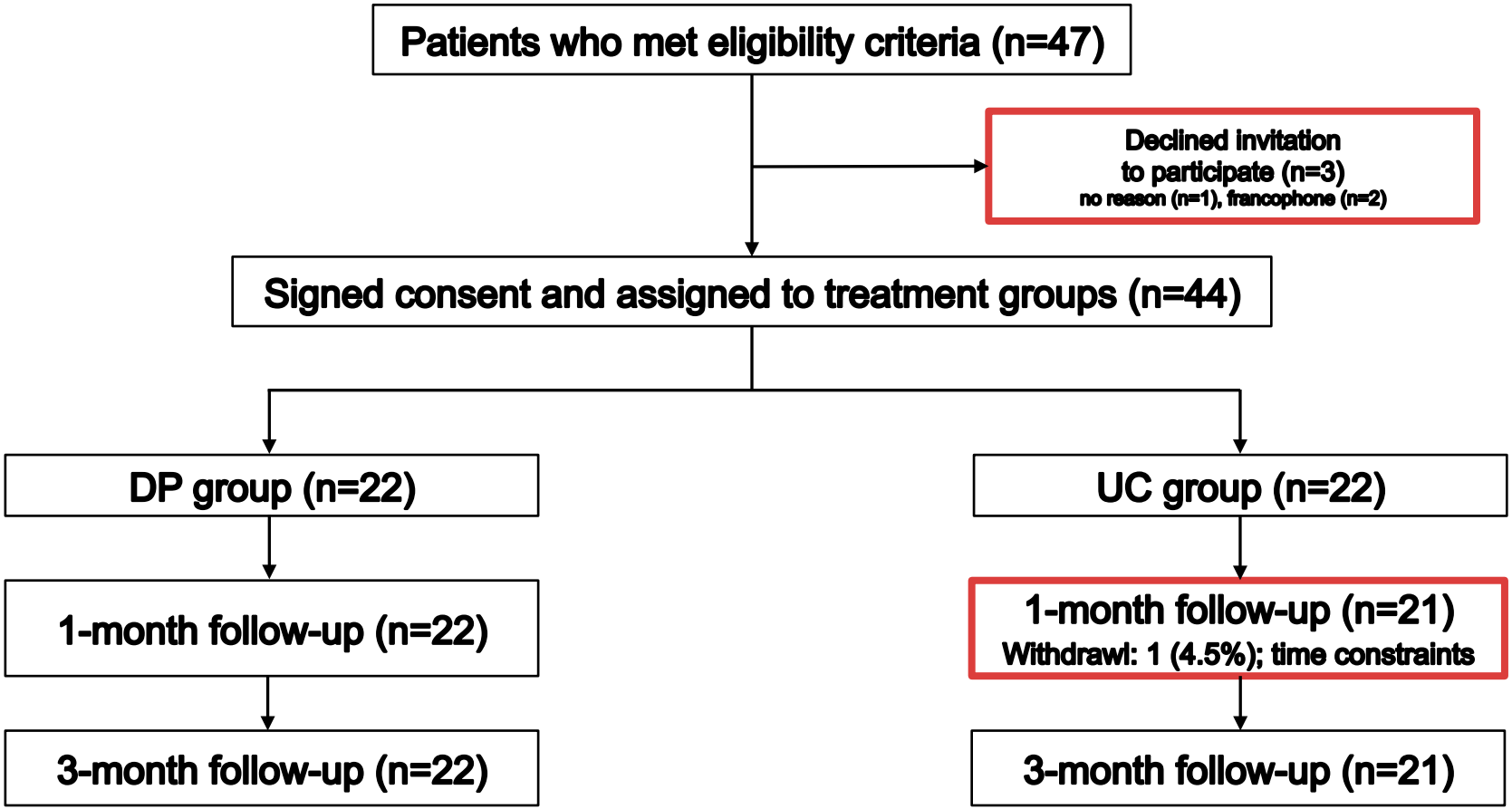
Variable	Description/ instrument
SELF-ADMINISTERED QUESTIONNAIRE	
Pain	**24h intensity (NPRS)**, 24h frequency, location
Perceived disability	Roland-Morris disability questionnaire (RMDQ)
Self-rated improvement	Pain, function, overall status (PGIC)[1]
Medication	Number of patients taking pain medication
ELECTRONIC HEALTH RECORD	
Work status	Off work, MEL[2] ≤ 30 days, MEL > 30 days, permanent MEL
Work loss[3]	Number of days on sick leave or with MELs
Health care utilization[3,4]	Number of visits, Investigations

[1]PGIC= perceived global impression of change, [2]MEL=medical employment limitations, [3]measured at 3-month follow-up,[4]excludes physiotherapy visits.

Statistical Analysis

- Sample size
  - Δ 2 points on 11-point numerical pain rating scale
  - Alpha: 0.05
  - Power 80%
- Baseline characteristics
  - Categorical variables: Chi-squared or Fisher exact tests
  - Continuous variables: independent t-tests, Mann-Whitney *U*-tests
- Treatment effects
  - Categorical variables: Chi-squared or Fisher exact tests
  - Continuous variables: repeated measures ANOVA (group x time), independent t-tests, Mann-Whitney *U*-tests

RESULTS


Patients who met eligibility criteria (n=47)
Declined invitation to participate (n=3)
no reason (n=1), francophone (n=2)
Signed consent and assigned to treatment groups (n=44)
DP group (n=22)
UC group (n=22)
1-month follow-up (n=22)
1-month follow-up (n=21)
Withdrawl: 1 (4.5%); time constraints
3-month follow-up (n=22)
3-month follow-up (n=21)

Baseline Characteristics

Variables	DP Group	UC Group
Age	33.9 (9.7)	38.0 (8.8)
Male, n (%)	15 (68.2)	14 (66.7)
BMI, kg/ m^2	27.2 (4.0)	27.1 (4.6)
Comorbidities (1 to 2), n (%)	7 (31.8)	9 (42.9)
Previous episodes of LBP, n (%)	17 (77.3)	20 (95.2)
Onset > 3 months, n (%)	12 (54.5)	8 (38.1)
Thigh pain, n (%)	10 (45.5)	9 (42.9)
Pain below knee, n (%)	5 (22.7)	4 (19.0)

$p > 0,05$

Baseline Characteristics

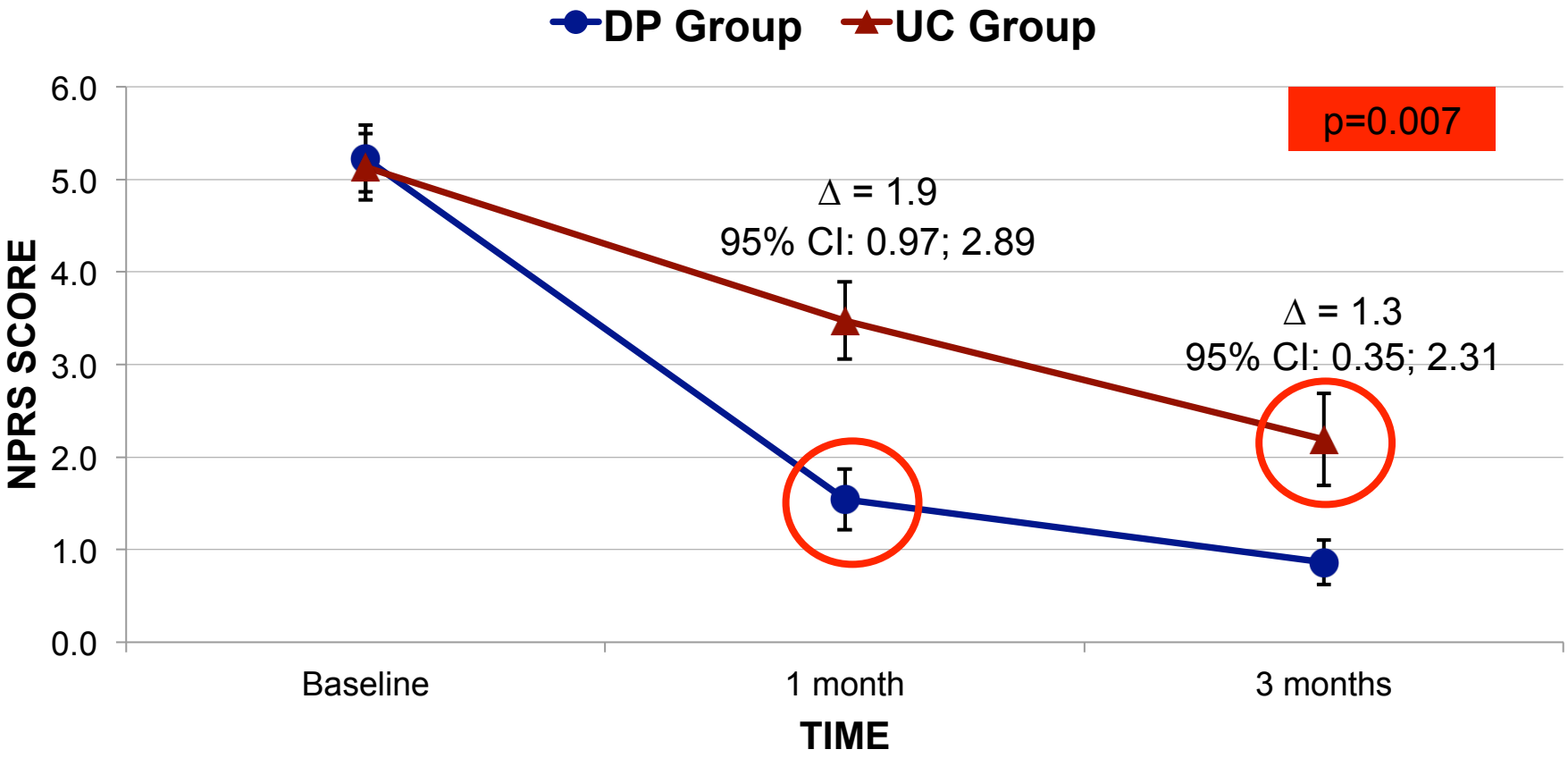
Variables	DP Group	UC Group.
Taking medication, n (%)	9 (40.9)	12 (57.1)
Officers, non-commissioned officers, n (%)	3 (13.6)	9 (42.9)
Off work, n (%)	4 (18.2)	1 (4.8)
Light duty, n (%)	9 (40.9)	7 (33.3)
Physical job demands, n (%)		
• *Sedentary/ light*	4 (18.2)	12 (57.1)
• *Medium*	10 (45.5)	6 (28.6)
• *Heavy/ very heavy*	8 (36.4)	3 (14.3)

Prevalence of DP

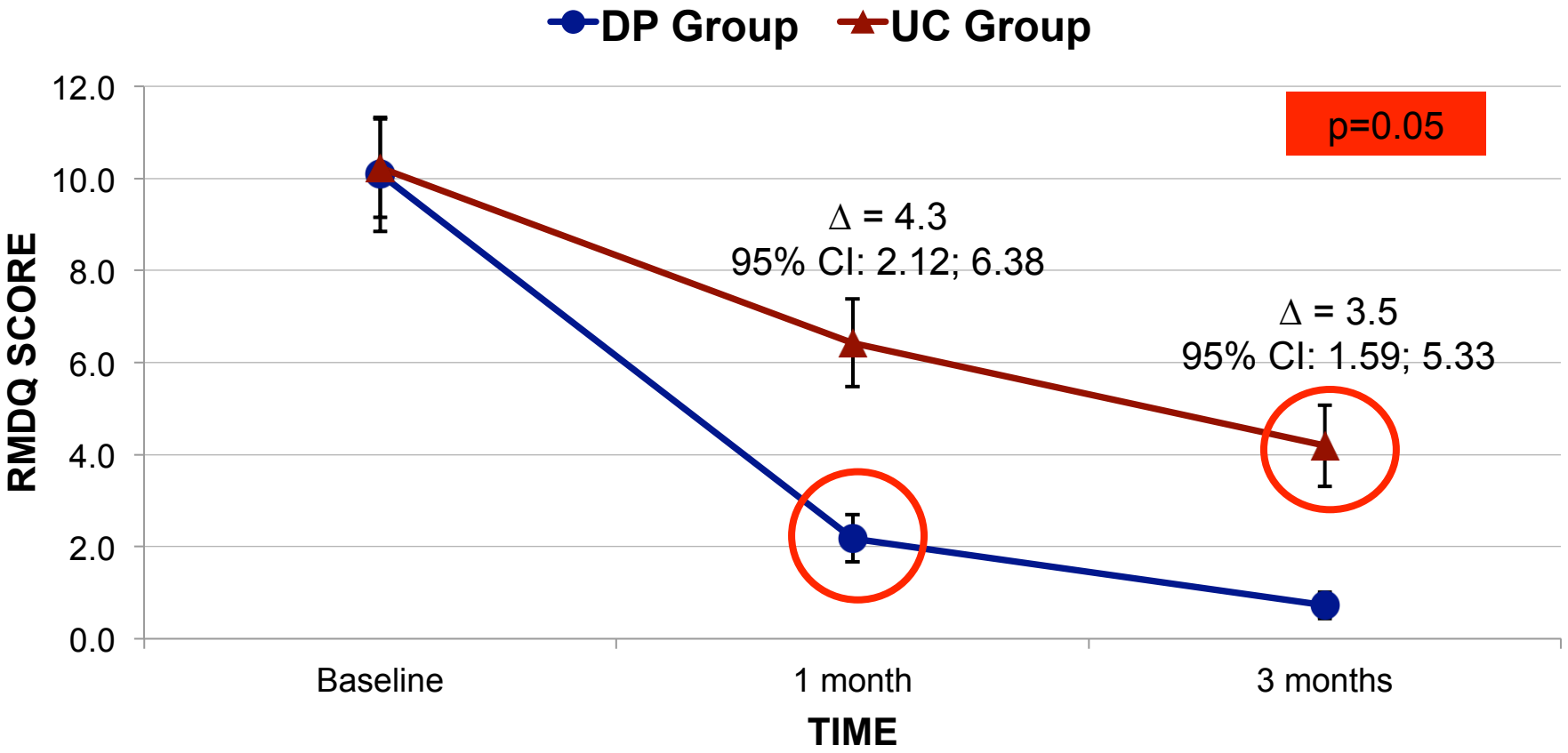
- Day 1: 16/ 22 (73%)
- **Day 4: 20/22 (90.9%)**
- Non-responders: 2/22 (9.1%)
  - Included in statistical analysis

DP group only!

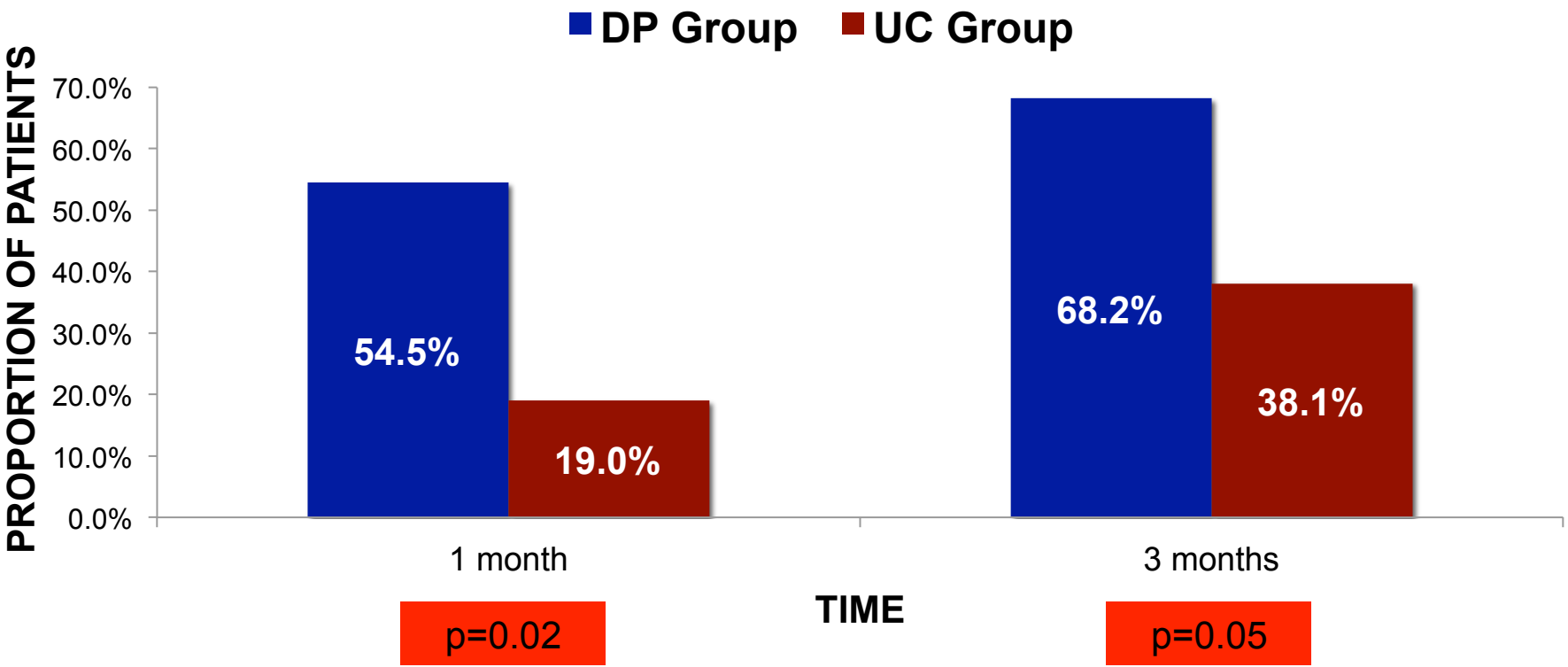
CHANGES IN 24-HOUR INTENSITY OF LBP



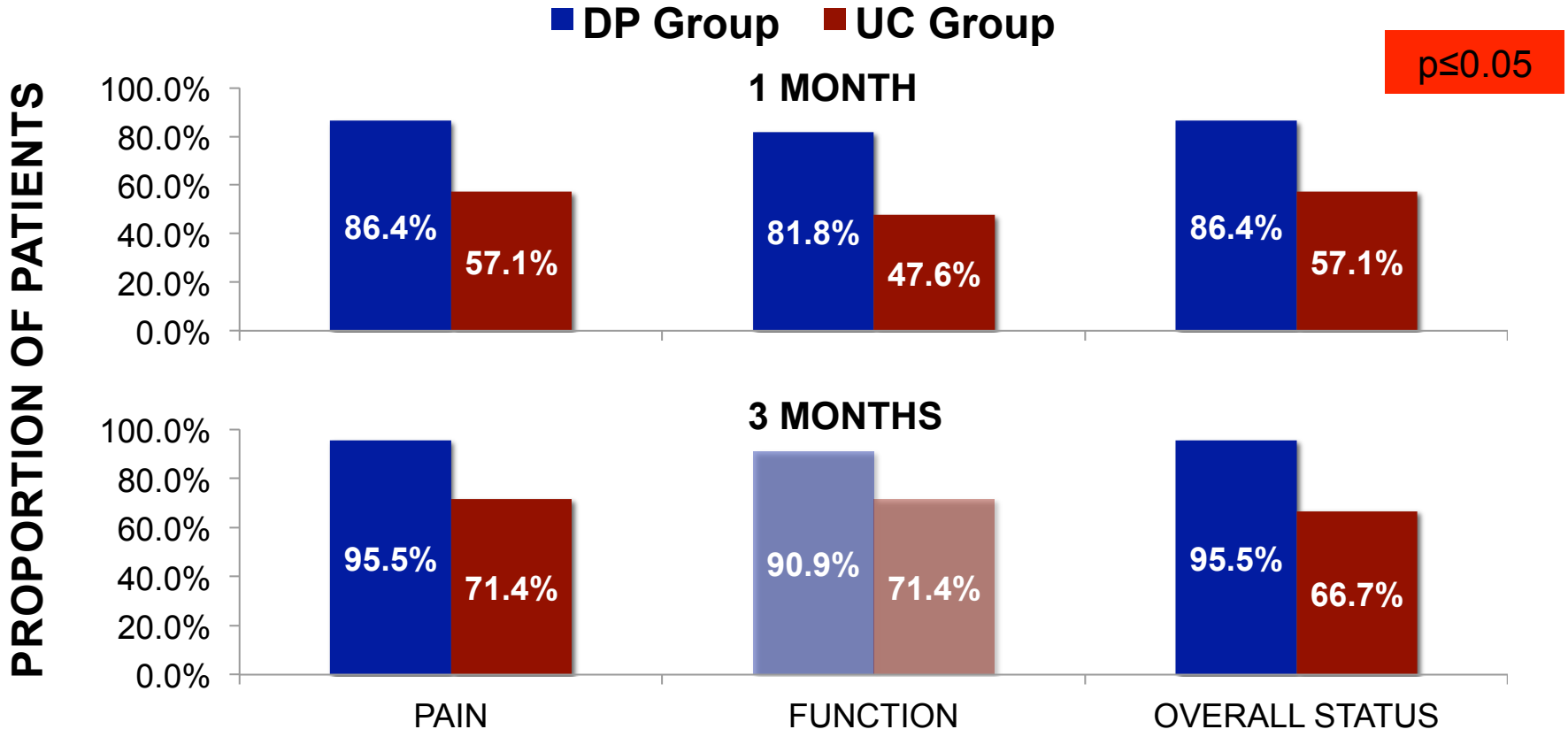
CHANGES IN LOW BACK DISABILITY



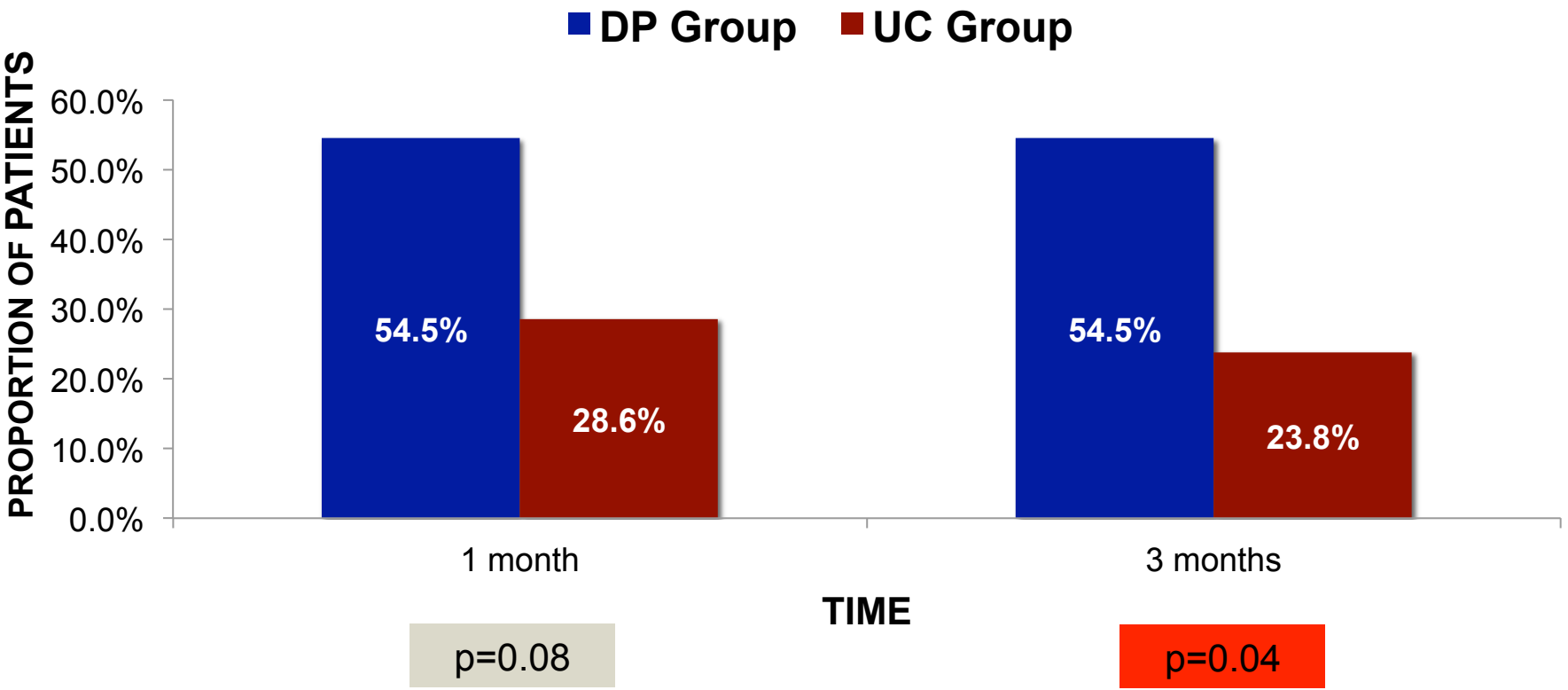
PROPORTION OF PATIENTS WITH IMPROVEMENT IN PAIN LOCATION



PROPORTION OF PATIENTS WITH SELF-RATED IMPROVEMENT FOR PAIN, FUNCTION AND OVERALL STATUS



PROPORTION OF PATIENTS WITH IMPROVEMENT IN WORK STATUS



DP-guided management

DP-guided management effective to:

- ✓ ↓ Pain (intensity, frequency)
- ✓ ↓ Low-back specific disability
- ✓ ↓ Duration of LBP-related work limitations
- ✓ Most patients can self-manage

ADVANTAGEOUS IN DEPLOYED SETTINGS

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REFERENCES

References:

- Born, J., Whitehead, J., & Hawes, R. (2010). Canadian Forces Health and Lifestyle Information Survey of Canadian Forces Personnel 2008/ 2009.
- Cohen, S. P., Gallagher, R. M., Davis, S. A., Griffith, S. R., & Carragee, E. J. (2012). Spine-area pain in military personnel: a review of epidemiology, etiology, diagnosis, and treatment. *Special Issue on The Casualties of War*, *12*(9), 833–842.
- Delitto, A. et al. (2012). Low back pain. *The Journal of Orthopaedic and Sports Physical Therapy*, *42*(4), A1–A57.
- Feuerstein, M., Berkowitz, S. M., & Peck, C. A. J. (1997). Musculoskeletal-Related Disability in US Army Personnel: Prevalence, Gender, and Military Occupational Specialties. *Journal of Occupational & Environmental Medicine*, *39*(1), 68–78.
- McKenzie, R., & May, S. (2003). *The Lumbar Spine: Mechanical Diagnosis & Therapy* (Vol. 2), New Zealand: Spinal Publications.
- Rowe, P., & Hébert, L. J. (2011). The impact of musculoskeletal conditions on the Canadian Armed Forces in *Shaping the Future: Military and VeteranHealth Research, Canadian Institute for Military and Veteran Health Research,* Kingston, ON, Canadian Defence Academy Press..