

Background

- PROMIS Physical Function v2.0 provides standardized measurement of physical functioning.
- WHO's International Classification of Functioning, disability and health (ICF) framework enables universal classification of health and disability.
- Mapping between these systems may improve interpretability and cross-system applicability.

Purpose

- This pilot study links PROMIS PF v2.0 items to ICF codes derived from rehabilitation goals of patients with chronic low back and pelvic pain.
- This linkage enables clinicians to simultaneously classify functional impairments and quantify severity through standardized measures.

Methods

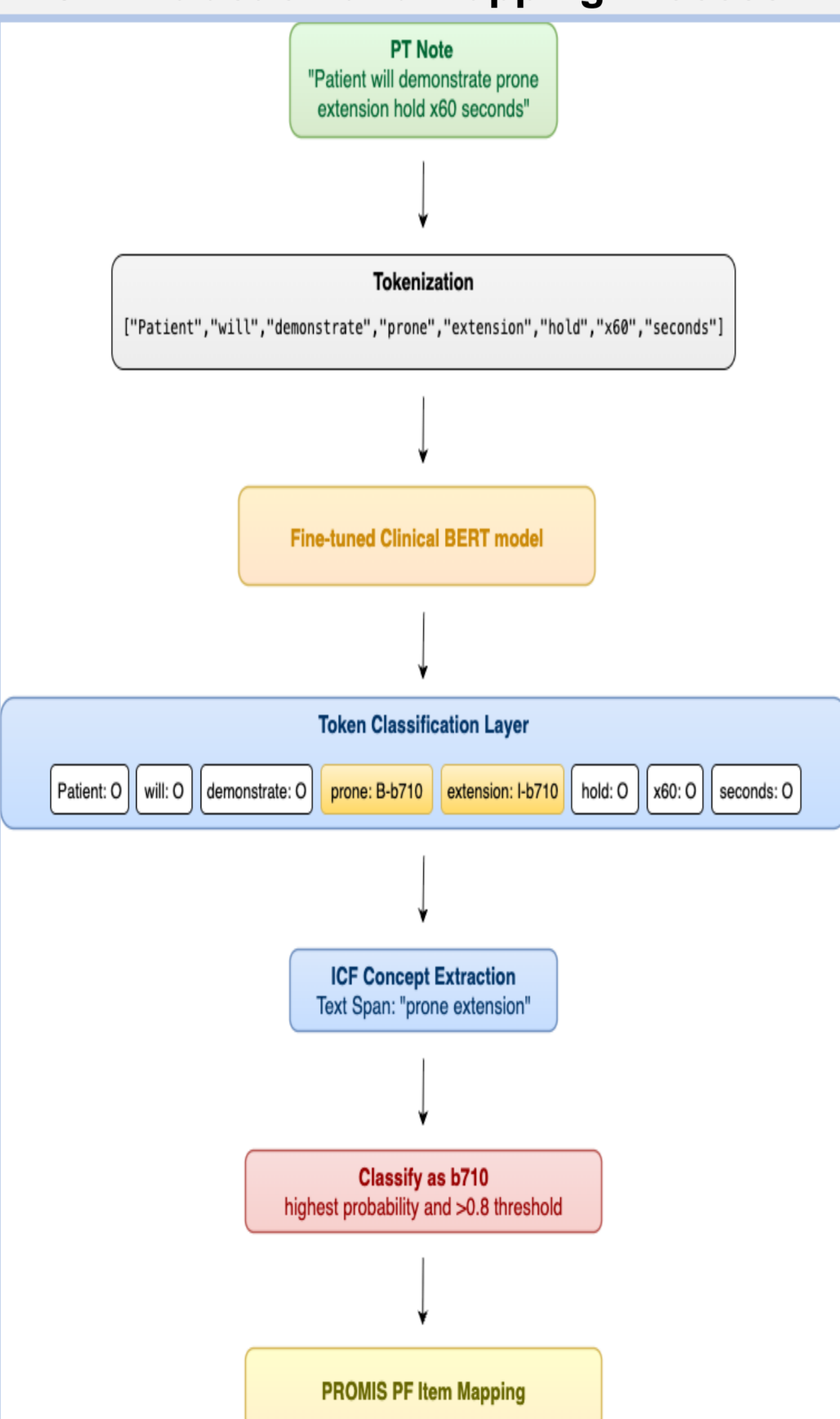
Data Source: Extracted patient goals from 407 clinical notes in cLBP and pelvic pain patients (n=266) from EHR data.

Approved IRB #19-28197
ICF Annotation: ICF experts created ground truth; two annotators jointly coded 78 notes to establish inter-annotator agreement and refine guidelines.

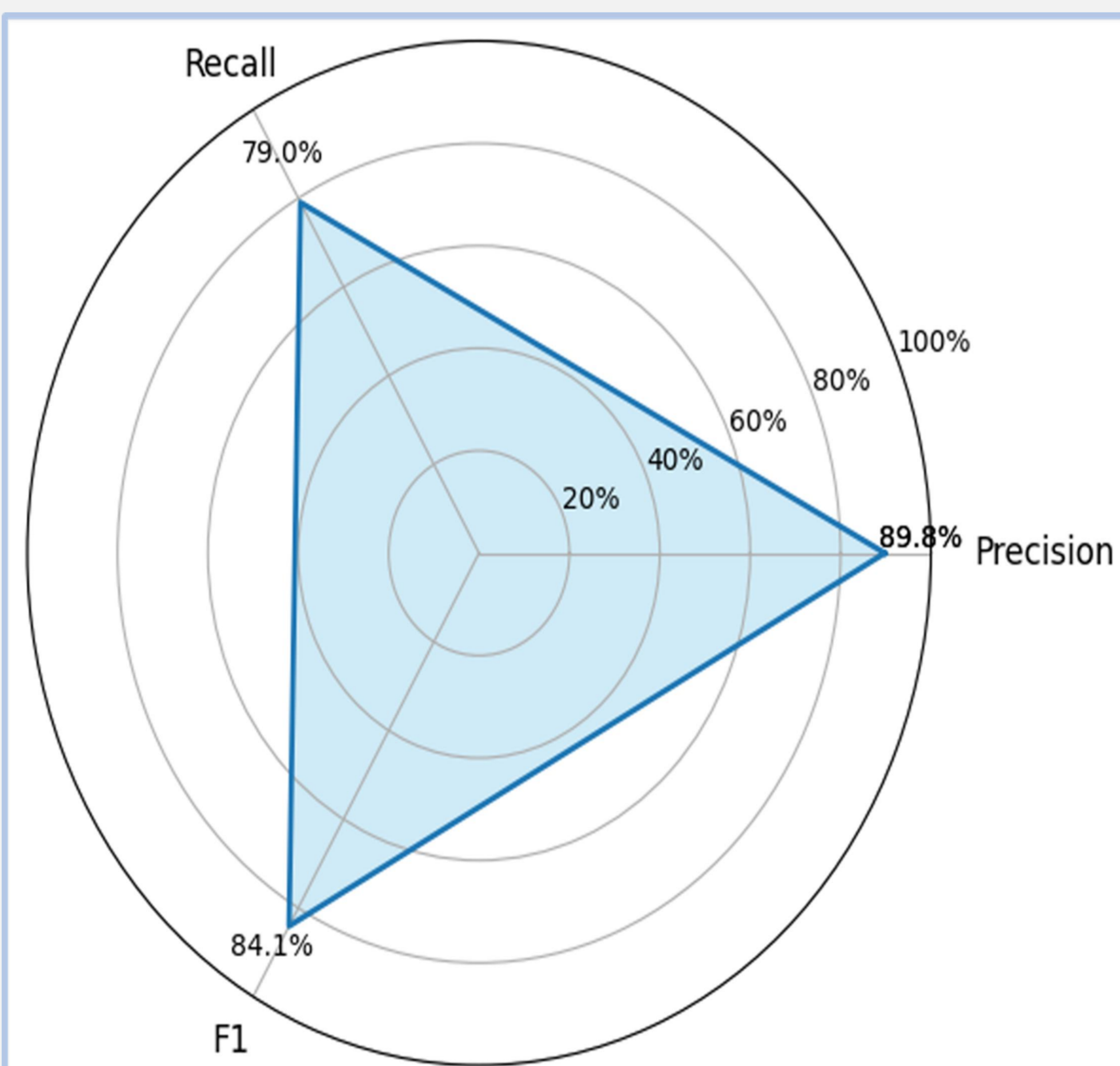
NLP Model: Fine-tuned clinical BERT to automatically extract ICF concepts (confidence >0.8) and map to codes.

Validation & Application: Evaluated model on test set, applied to 20,820 note sections to link PROMIS PF items with matching ICF concepts for 3,484 patients.

ICF Extraction and Mapping Process



Fine-tuned Clinical BERT Model Performance Metrics



Model Performance

- Inter-annotator agreement: F1 = 77.3%
- Fine-tuned model: Micro F1 = 84.1% (Precision: 89.8%, Recall: 79.0%)

ICF-PROMIS Linkage

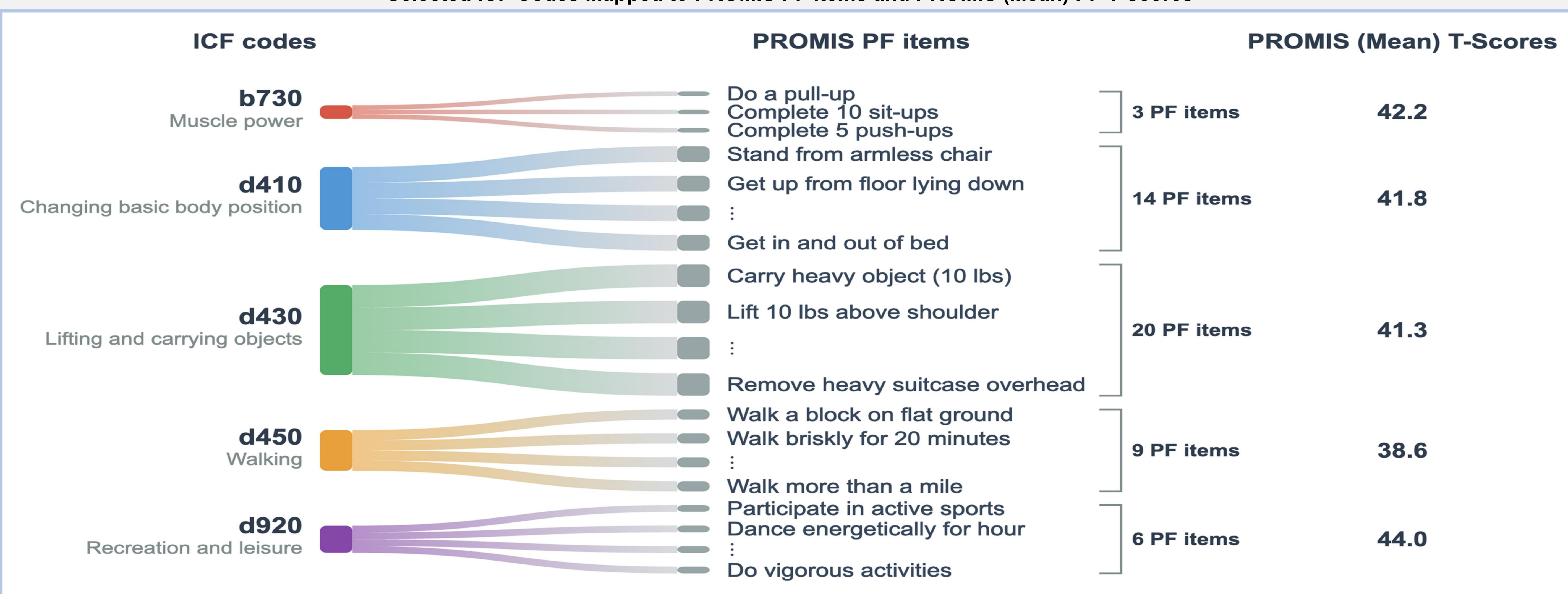
- 119 of 165 PROMIS PF items** linked to ICF codes (level 2)
- Primary domains: Mobility (79.0%), Cardiovascular/Respiratory functions (7.6%), Domestic life (5.9%)

Clinical Patterns in cLBP/Pelvic Pain Patients (n=3,484)

- Frequent Mobility ICF codes (d410, d430, d450) associated with lower mean baseline PROMIS PF T-scores: 38.6–41.8 vs. reference value of 50
- Association between frequent ICF codes and lower PROMIS PF T-scores not statistically significant (Mann-Whitney U, p>0.05)

Results

Selected ICF Codes Mapped to PROMIS PF items and PROMIS (Mean) PF T-scores



Conclusions

- Links ICF clinical goals to PROMIS PF items:** bridging a standardized classification system with validated outcome measure and transforming narrative data into structured information.
- Enables novel analyses** of disability patterns and functional scores while supporting automated extraction of functional profiles in goal setting.

Relevance

- May facilitate goal setting in rehabilitation** using linked ICF codes to PROMIS items to identify target functions and desired functional level.
- Potentially guide intervention planning** using item-level PROMIS data linked to ICF codes to establish functional goals and monitor progress.

Limitations

- Small sample size** may limit model performance, robustness, and generalizability of results.
- Model-classified ICF codes** were used to map to PROMIS PF items, scores, and were not independently verified by human reviewers.

Future Plans

- Expand dataset** with larger, diverse sample cLBP & pelvic pain patients to improve generalizability and inform population health initiatives.
- Further fine-tune the Clinical BERT model** to optimize accuracy and efficiency in identifying ICF concepts from patient notes.
- Link & combine with other PROMIS measures** such as Pain Interference and Mood for holistic assessments.

References

- HealthMeasures. *PROMIS Physical Function User Manual and Scoring Instructions*.
- ICF Browser*. World Health Organization. (n.d.).

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- Langer, M. M., Nesbit, K. C., Dien, A., Jaramillo, T., & Pak, S. (2025, September 25). *Content analysis of Promis physical function banks using the International Classification of functioning, disability and health - quality of life research*.

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