

# Identifying patients with delayed pain interference recovery after solid organ transplantation using supervised cluster analysis



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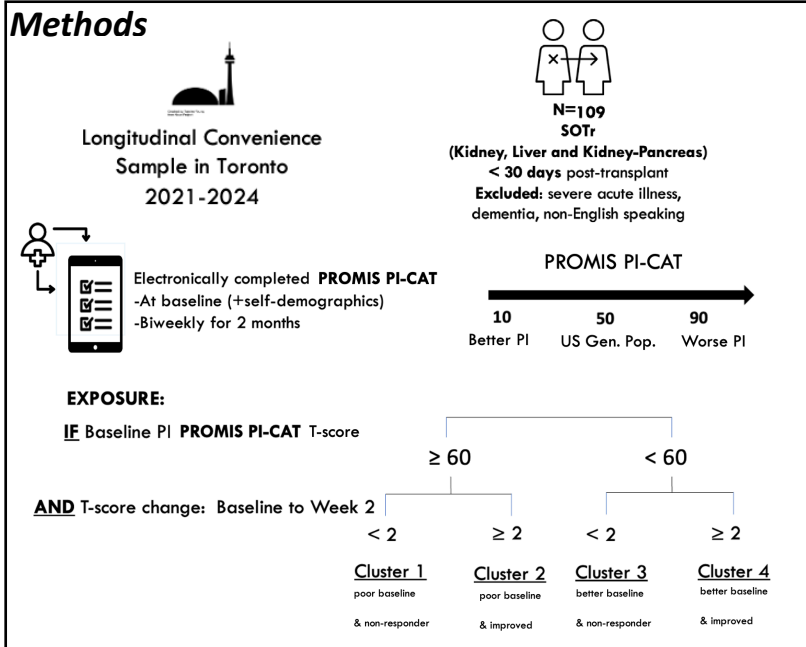
## Background

Solid organ transplant recipients (SOTr) with delayed recovery of pain interference (PI) post-transplant may benefit from early post-transplant support.

## Objective

We aimed to identify patterns of PI recovery using supervised cluster analysis of longitudinally obtained Patient Reported Outcome Measurement System (PROMIS) PI scores.

## Methods



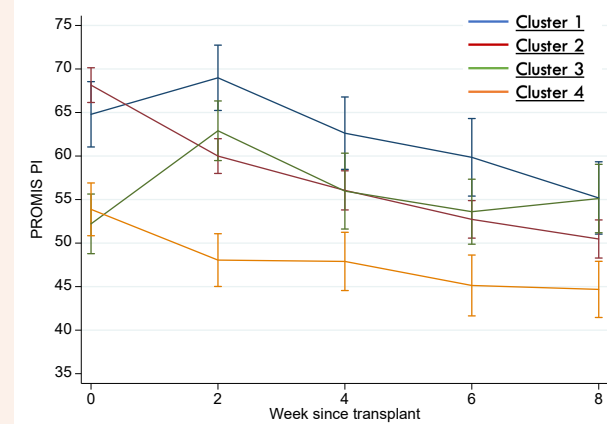
## Results 1) Baseline Characteristics

Characteristic	Cluster 1 N=15	Cluster 2 N=53	Cluster 3 N=18	Cluster 4 N=23	P-value
Age, years; mean (SD)	43.6 (12.5)	47.2 (11.9)	57.3 (12.3)	52.5 (15.1)	0.006
Sex, female; n (%)	6 (40)	26 (49.1)	5 (27.8)	7 (30.4)	0.285
SES / OMI deprivation; n (%)					0.250
Low	6 (40.0)	18 (40.0)	9 (52.9)	7 (33.3)	
Middle	7 (46.7)	10 (22.2)	3 (17.7)	4 (19.1)	
High	2 (13.3)	17 (37.8)	5 (29.4)	10 (47.6)	
Charlson Comorbidity Index ≥ 4; n (%)	2 (13.3)	19 (39.6)	2 (13.3)	8 (36.4)	0.097
Serum albumin, g/L; mean (SD)	37.1 (6.6)	35.2 (15.0)	37.8 (5.9)	34.1 (4.2)	0.736
Hemoglobin, g/L; mean (SD)	101.1 (17.1)	98.5 (18.0)	97.3 (18.8)	96.2 (10.5)	0.855
Diabetes, Yes; n (%)	2 (13.3)	14 (33.3)	1 (7.1)	6 (30.0)	0.154
Time since transplant, days; mean (SD)	6.4 (5.4)	6.6 (3.7)	5.6 (6.4)	7.3 (5.4)	0.769
Race / Ethnicity; n (%)					0.079
White	5 (33.3)	34 (69.4)	13 (81.3)	15 (71.4)	
Asian	7 (46.7)	9 (18.4)	3 (18.8)	3 (14.3)	
Black	1 (6.7)	4 (8.2)	0 (0.0)	3 (14.3)	
Other	2 (13.3)	2 (4.1)	0 (0.0)	0 (0.0)	
Organ type; n (%)					0.065
Kidney	12 (80.0)	21 (39.6)	12 (66.7)	14 (60.9)	
Kidney-Pancreas	0 (0.0)	6 (11.3)	0 (0.0)	1 (4.3)	
Liver	3 (20.0)	26 (49.1)	6 (33.3)	8 (34.8)	
PROMIS Anxiety, mean (SD)	60.8 (6.3)	61.0 (6.5)	55.0 (7.5)	54.2 (7.1)	<0.001
PROMIS Depression, mean (SD)	53.9 (8.7)	55.1 (9.7)	49.2 (9.2)	48.2 (8.0)	0.009
PROMIS Fatigue, mean (SD)	60.5 (6.6)	61.6 (7.8)	54.3 (6.1)	53.1 (9.3)	<0.001
PROMIS Sleep Disturbance, mean (SD)	57.6 (6.8)	60.8 (8.1)	59.4 (9.7)	55.3 (8.0)	0.059
PROMIS Pain Interference, mean (SD)	64.8 (3.9)	68.1 (4.5)	52.2 (7.0)	53.9 (6.2)	<0.001
PROMIS Cognitive Function, mean (SD)	41.9 (4.7)	43.3 (7.6)	46.0 (8.7)	49.7 (8.9)	0.006
PROMIS Physical Function, mean (SD)	36.7 (6.9)	33.0 (6.8)	36.5 (9.7)	38.7 (8.4)	0.020
PROMIS Short. of Breath, mean (SD)	44.9 (9.4)	45.2 (11.7)	32.8 (11.2)	37.4 (13.1)	0.001

## 2) How does recovery trajectory differ across clusters?

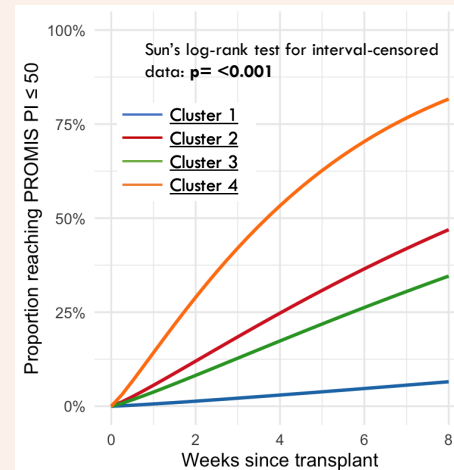
Mean (SD) change in PROMIS PI between baseline and week 8:

- Cluster 1: -10 (6)
  - Cluster 2: -18 (8)
  - Cluster 3: 2 (7)
  - Cluster 4: -8 (7)
- P<0.001 (for Clusters 1 and 2)  
 P<0.001 (for Clusters 3 and 4)



## 3) How many participants reach a clinically meaningful score (PROMIS PI ≤50) by 2 months (proportional-hazards models with Weibull baseline for interval-censored data)

- Cluster 1: 7%
- Cluster 2: 47%
- Cluster 3: 33%
- Cluster 4: 82%



## Summary & Discussion

- Baseline PROMIS-PI scores and early change in scores identified patients with delayed recovery among SOTr.
- Future studies should further investigate patients who may need support for their pain interference, such as post-transplant pain management and support