

Patients Like Me: Data Aggregation and Summary

Patient Summary:

Age: ## years old

Sex: M / F

Time Since Injury: ## days

Prior Concussion(s): None

Exercising Since Injury: No

Current Sleep Problems: Yes

Balance Errors (BESS): 14

Symptom Burden Score: 14

Headache Severity Score: 0

Aggregate Demographics:

Mean (standard deviation)

Age: 15.2 (1.7) years old

Sex: 88% Female

Time Since Injury: 13.7 (4.6)

Prior Concussion(s): 0.6 (0.8)

Exercising Since Injury: 4.5%

Current Sleep Problems: 79.5%

Balance Errors (BESS): 8.2 (4.8)

Symptom Burden Score: 18.4 (9.7)

Headache Severity Score: 1.9 (2.1)

Recovery Expectations:

Based on the recovery of patients like you, we expect your symptoms to resolve within 19 to 33 days.

Time to Symptom Resolution:

Mean: 26.2 days

95% Confidence Interval: 19 - 33 days

Time to Return to Play:

Mean: 42.5 days

95% Confidence Interval: 34 - 43 days

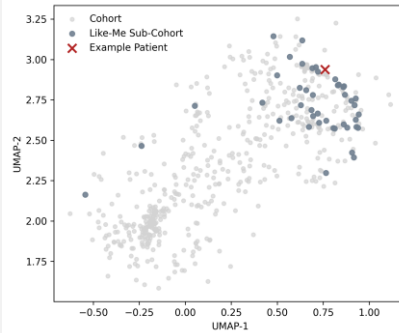
PSaC Development:

Yes: 18% | No: 34% | Unknown: 48%



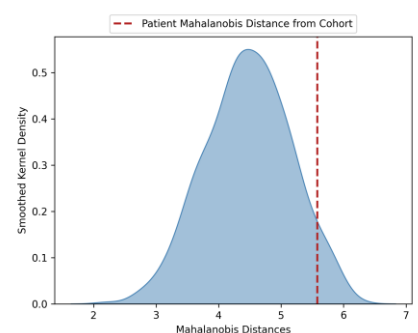
Your Like-Me Cohort:

Visualize your like-me cohort and you:



Subjects in your like-me cohort are similar to you in demographics! Your cohort size is **44**.

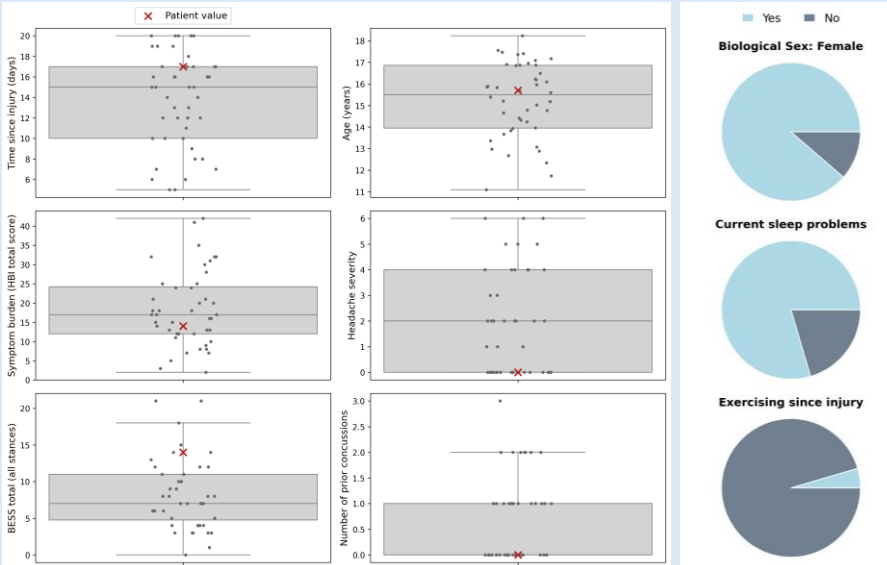
How similar are you to the reference cohort?



Only 6% of people are less similar to the overall cohort than you. Your characteristics are unique!

Visualizing Your Like-Me Cohort:

Below are the characteristics for your like-me cohort. Your values are also shown with an X.

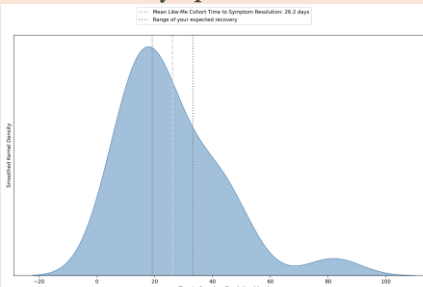


The subjects in your Like-Me Cohort are similar to you in age, symptom burden, time since injury, and a number of other factors. Though some variability exists, these are the people most like you!

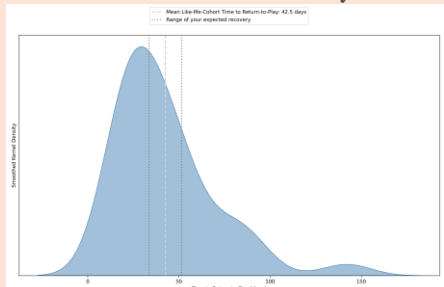
Visualizing Your Expected Recovery:

Below are the recovery outcomes for patients like you. We expect your recovery will be similar.

Time to Symptom Resolution:



Time to Return to Play:



Patients Like Me: Performance Metrics

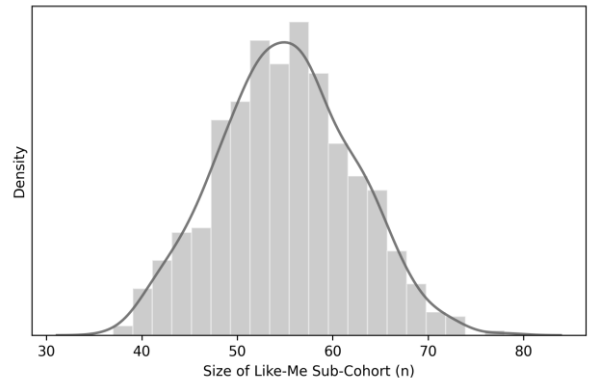
Purpose:

This document summarizes various performance metrics for the like-me cohort – to be used by patients and clinicians to understand the accuracy of a like-me cohort!

Primary objectives: (1) Minimize the distance between the Like-Me Cohort and the patient based on demographics/clinical characteristics. (2) Maximize the distance between the patient and all the remaining subjects in the reference cohort. (3) For important characteristics (age, time since injury, symptom burden), show that the difference between the patient value and the group mean is smallest for the Like-Me Cohort and larger for the remaining subjects in the reference cohort. (4) Show that the difference between patient recovery outcomes (time to symptom resolution and return to play) and the group mean is smallest for the Like-Me Cohort and larger for the remaining subjects in the reference cohort.

Validation: For all 558 subjects in the reference cohort, iterate through using each as the “example patient”, generate their unique Like-Me Cohort, then calculate performance metrics.

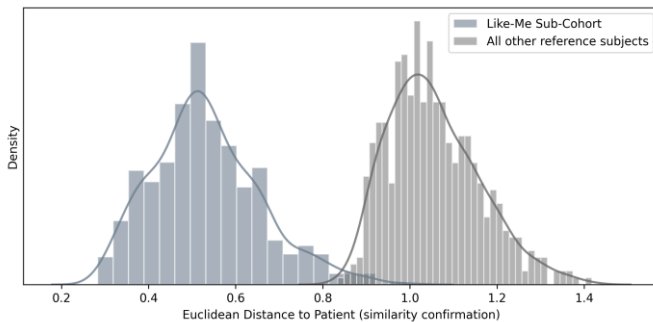
Average Like-Me Cohort Size:



The Like-Me Cohort size is different for every patient. It is based on the patient's Mahalanobis distance from the mean of the reference cohort. A larger Mahalanobis distance means the patient is less similar in clinical presentation than subjects already in the reference cohort – thus, they get a smaller Like-Me Cohort size.

The mean Like-Me Cohort size was 55.1 subjects and ranged from 37 to 78 subjects.

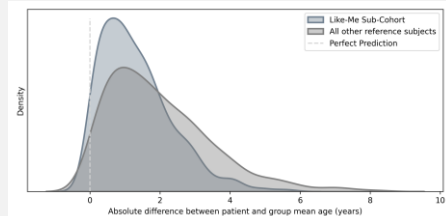
Euclidean Distances Between Groups:



After iterating through each subject, on average the Like-Me Cohort was closer (smaller Euclidean Distance) to the patient than the remaining reference cohort subjects ($p < 0.001$).

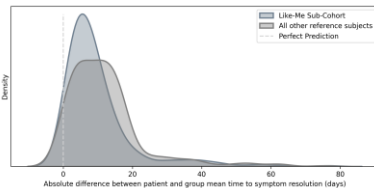
Average Like-Me Cohort Size:

After iterating through each subject, we calculated the difference between the actual patient age, time since injury, and symptom burden score, and the mean of each of those features in the Like-Me Cohort and among all the remaining reference subjects.



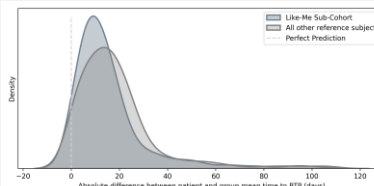
← The Like-Me Cohort's average age is closer to the patient's age (absolute error: 1.3 years vs 2.0 years; $p < 0.001$).

Euclidean Distances Between Groups:

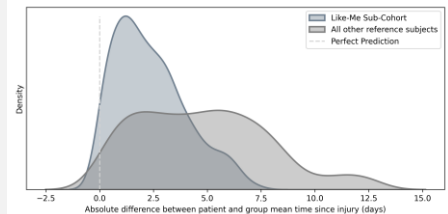


← The mean of the Like-Me Cohort's time to symptom resolution was closer to the patient's actual time to symptom resolution than the mean of the remaining subjects in the reference cohort ($p < 0.001$).

The mean of the Like-Me Cohort's time to return to play was closer to the patient's actual time to symptom resolution than the mean of the remaining subjects in the reference cohort ($p < 0.001$).



Like-Me Cohort's average time since injury is closer to the patient's as well (abs error: 2.4 days vs 4.8 days; $p < 0.001$).



← The Like-Me Cohort's average symptom burden score is closer to the patient's (abs error: 6.1 points vs 11.9 points; $p < 0.001$).