

# Development of a Best Practice Model in Acute Concussion Care:

**The Hull-Ellis Concussion and Research Clinic at the Toronto Rehabilitation Institute**

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The Hull-Ellis Concussion  
and Research Clinic



# What we know about concussion:

- \* Concussion is an injury of individual differences.
- \* No gold-standard diagnostic 'tests' for concussion
- \* Clinician is entirely dependent on self-report of symptoms
- \* 85 percent of individuals will recover from a first concussion in 2 to 3 weeks.
- \* 15 percent will have protracted recoveries.
- \* No accurate method to predict who will/will not recover quickly
- \* Most research is in athletes and adolescents and not the general population.



# Clinic Background

- \* The Hull-Ellis Concussion and Research Clinic opened in February of 2016
- \* To provide clinical care for adult patients diagnosed with concussion (acutely) among the general population



# Main Objectives of the clinic:

To prospectively characterize and understand factors associated with concussion stratified by age, gender, and education and other modifiers, including

- \* mechanism of injury
- \* symptoms at first visit
- \* the 'normal' recovery trajectory
- \* gender differences
- \* neurocognitive/psychological dysfunction
- \* balance impairment



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# Referral/Recruitment Process

- \* Patients diagnosed with concussion are referred from a number of partnering Emergency Rooms in Toronto, namely Toronto General and Toronto Western of UHN, Mount Sinai Hospital and more recently from Michael Garron Hospital
- \* Patients are seen for first visit within a week of their injury
- \* If patient consents, they are followed for 16 weeks
- \* Non-participants get physician assessment and follow up for 8 weeks



# Research Methods

- \* This is a prospective, naturalistic cohort study
- \* Inclusion criteria:
  - \* adults ages 17- 85 years
  - \* Diagnosed with acute concussion in an ER in Toronto
  - \* GCS=13-15
  - \* not admitted to hospital
  - \* no Neurological/positive imaging findings
  - \* 1<sup>st</sup> visit within a week of injury



# Research Methods Cont.

- \* Data Captured:
  - \* Degree' of subjective cognitive complaints
  - \* NINDS common data elements include demographic information, gender, level of education, mechanism of injury
  - \* Cognition
  - \* Balance
  - \* Psychological symptoms
  - \* Physician assessments includes date of discharge /recovery





# Clinical Care

- \* Clinical care by a physician:
  - \* medical assessment
  - \* education, support and symptom management
  - \* regular monitoring and follow-up.



# Study numbers

- \* As of Dec. 2017, we have had 202 consenting participants
- \* Of those, 52 patients did not complete the study either because they withdrew or were lost to follow up
- \* 9 patients were still in the study (<8 weeks post injury) and so we have no recovery data
- \* All in all, we have recovery data for 141 patients



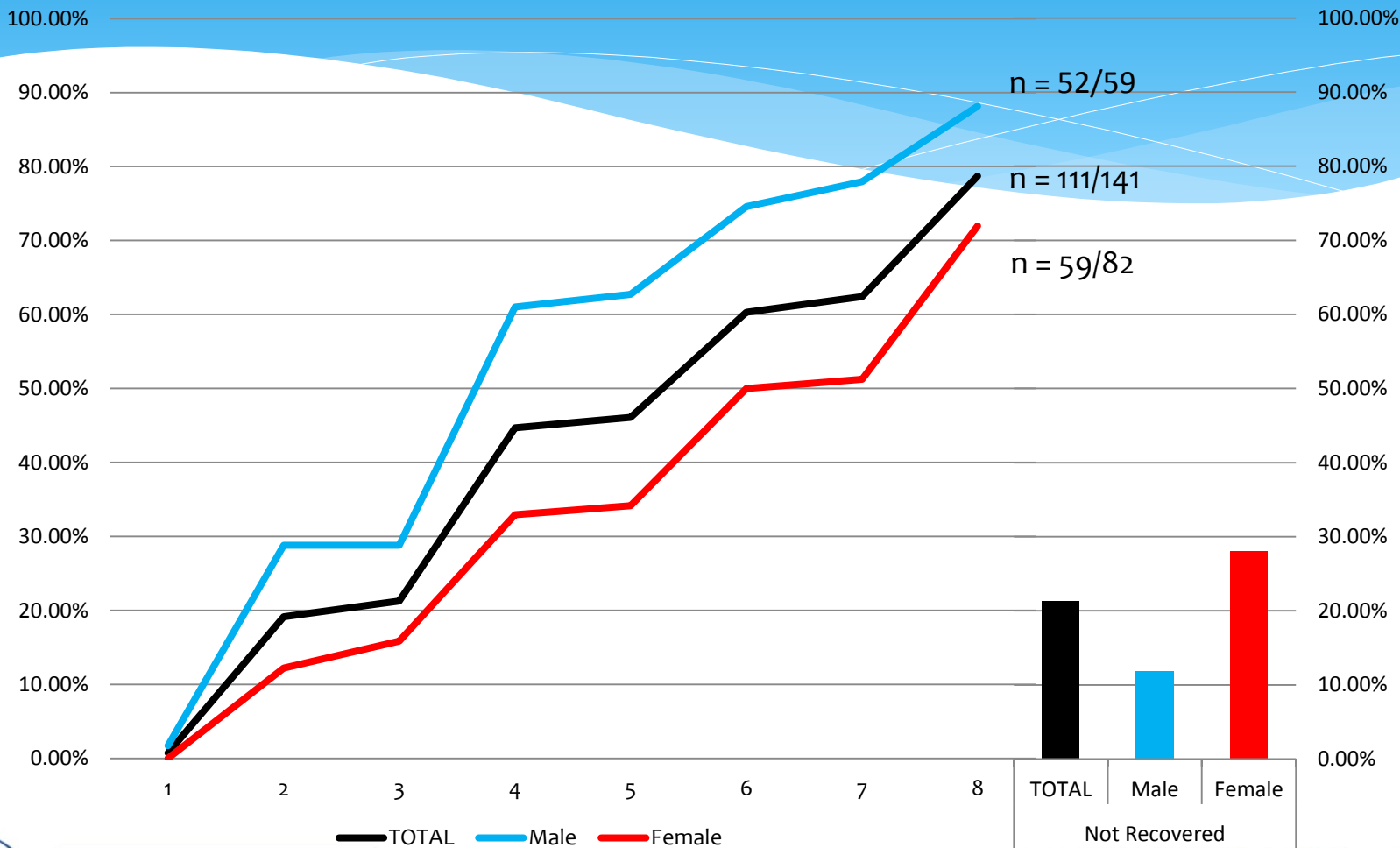
# Patient Demographics (n=202)

Males	42%
Females	58%
Average Age	33.955
Median Education	Bachelors
Median Income	\$40,000 to \$60,000
Three most common pre-existing conditions	Anxiety, Depression, and Migraine
Employment Status	Employed or Students
Involved in some form of sports activity pre-injury	114 (56.4%)
Involved in rec. sports activities	70 (34.7%)
Patients who sustained sports related	54 (26.7%)

# Trends in Recovery

## Recovery vs. Sex

52 patients did not complete the program.  
 30 patients did not recover by week 8.  
 9 patients still undergoing f/u care.  
 n = 141



n = 52/59

n = 111/141

n = 59/82



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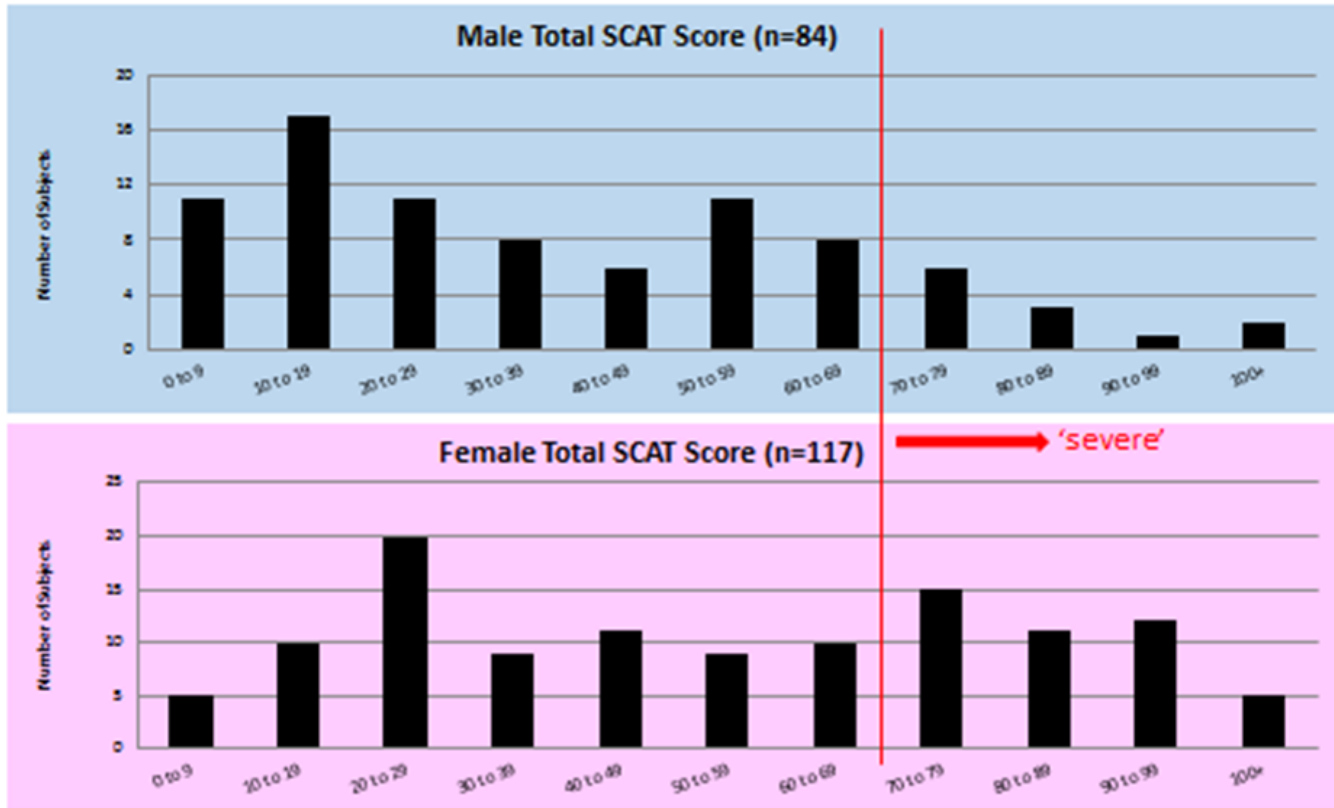
# Trends in Recovery Cont.

- \* Only 21% remained symptomatic at Wk. 8, related to concussion; 5:1 Female to Male ratio.
- \* 21 % of individuals recovered by Weeks 3 and 45% of individuals recovered by Week 4 post injury



# General Trends in Symptom Report

## Distribution of Total SCAT3 Scores /132



# General Trends in Symptom Report

- \* Gender difference seen in symptom reporting and persisting symptoms
- \* Females report more symptoms, at a more-severe level than males in the post-acute phase (at 6 days)
- \* Females report more symptoms at week 16 on a mood measure



# Discussion

- \* Symptom endorsement, symptom severity and overall recovery across time varied with sex
- \* Differences in initial reported symptoms and recovery time may serve as a guide to clinicians to target specific symptoms at critical time-points in the patient's recovery, based on gender.





# Limitations

- \* Standardize definition of recovery
- \* Congruency between physician's determination of recovery and patient's report of recovery
- \* Potential biased sample



# With thanks...

- \* The clinical and research team at The Hull-Ellis Concussion and Research Clinic
- \* The Foundation Office at Toronto Rehab for supporting us
- \* **Follow us on Twitter @Hull\_EllisCC**



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