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Can clinicians predict a patient's capacity to walk after a traumatic spinal cord injury?

Rémi Pelletier-Roy, MD^{1,2}, Andréane Richard-Denis, MD, MSc^{1,2}, Stéphanie Jean, MD^{1,3}, Étienne Bourassa-Moreau, MD, MSc^{1,2}, Jean Fleury, MD^{1,3}, Geneviève Beauchamp-Vien, MSc², Jean Bégin, PhD², Jean-Marc Mac-Thiong, MD, PhD^{1,2}

- Université de Montréal, Faculty of Medicine, Montreal, Quebec, Canada
 Hôpital du Sacré-Cœur de Montréal, Montréal, Quebec, Canada
- 3. Institut de réadaptation Lindsay-Gingras de Montréal, Montreal, Quebec, Canada

Centre intégré universitaire de santé et de services sociaux du Nord-del'Île-de-Montréal



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Context

- Ambulation recovery is one of the highest priorities for patients after a traumatic spinal cord injury (tSCI)
- Increased popularity of clinical prediction rules (CPR) in medical literature
 - Only a few have been compared to unstructured clinical judgment¹
- Many CPR exist for ambulation outcomes after a tSCI
 - None of them have been compared to unstructured clinical judgment

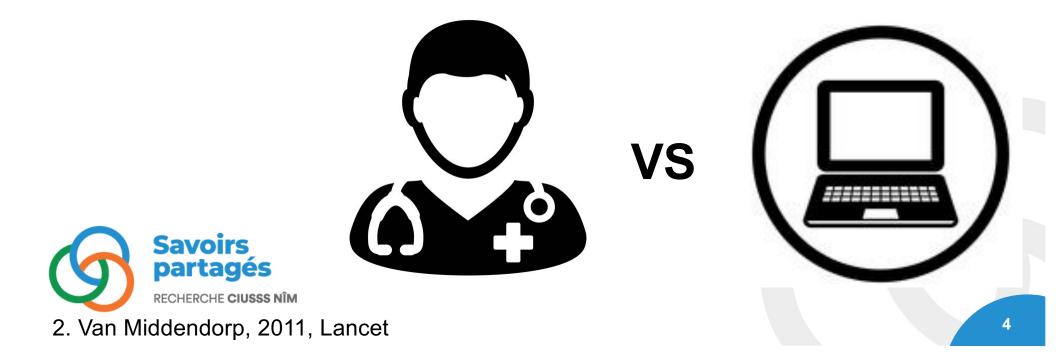


Objective

 Compare unstructured clinical judgment to van Middendorp's CPR² (vM-CPR) on predicting ambulation outcomes after tSCI

Hypothesis

- vM-CPR is more accurate than unstructured clinical judgment
- vM-CPR should be routinely used in clinical practice



M&M – Design

• Retrospective comparative study on a prospective cohort

6 clinicians

- 2 different clinical settings
 - Acute and long-term rehabilitation facilities
- 2 different fields of expertise
 - Physical Medicine and Rehabilitation (PM&R) and Orthopedic Surgery
- Different levels of experience
 - Residents to senior staff
- Predicting item 12 of the Spinal Cord Independence Measure (SCIM)
- Compared to vM-CPR's accuracy



M&M - Statistics

• To detect a 5% clinical difference

• Between vM-CPR and clinicians

Sample required: 68 patients

- p<0.05
- Power 80%

Bilateral McNemar test



M&M - Population

Table I. Characteristics of the Study Cohort

	Study Cohort (n=68)		
Settings	Level one trauma center		
	specialized in tSCI		
Inclusion period	April 2010 to December 2018		
Sex male (n, %)	54 (79%)		
Age (mean ±SD)	44 (±18)		
AIS grade (n, %)			
Grade A	28 (41%)		
Grade B	21 (31%)		
Grade C	19 (28%)		



Results

Table II. Van Middendorp's CPR accuracy stratified by AIS grade compared to clinicians

	Clinical prediction rule (vM-CPR)	All clinicians	
AIS grade A	89%	89%	
AIS grade B	76%	83%	
AIS grade C	74%	68%	
All grades	81%	79%	

Similar performances between vM-CPR and clinicians



Results

Table III. Individual clinician's accuracy stratified by AIS grade

	PM&R resident	PM&R junior staff	PM&R senior staff	Orthopedic resident	Orthopedic junior staff	Orthopedic senior staff
AIS grade A	71%	86%	86%	89%	89%	89%
AIS grade B	71%	81%	81%	86%	81%	86%
AIS grade C	68%	84%	42%	63%	84%	68%
All grades	71%*	84%	72%*	81%	85%	82%

Lower accuracy for long-term rehabilitation clinicians in our group

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partagés

Savoirs

Conclusion

- 1st study to compare clinicians to a CPR on predicting ambulation outcomes after a tSCI
 - Similar performances between vM-CPR and clinicians
 - Lower accuracy for long-term rehabilitation clinicians in our group
- **Essential steps** to validate a CPR:
 - 1. Define the minimal performance improvement needed by the CPR
 - 2. Build an adequately sized cohort of patients and clinicians
 - 3. Select the information disclosed to clinicians
 - 4. Compare clinicians' prediction to the CPR

• CPR usage should be personalized depending on:

- Individual clinician accuracy
- Complexity of prediction
- Educational purposes

