

Cold Sensitivity Evaluation Using Cold Air Exposure Versus Cold Water Immersion

Christine B. Novak PhD^{1,2} Steven J. McCabe MD¹ Yue Li PhD² Geoff Fernie PhD²

Hand & Upper Extremity Program, University of Toronto¹, Toronto Rehab Institute - UHN², Toronto, Canada

Purpose:

The purpose of this study was to evaluate the physiologic responses following cold water immersion versus cold air exposure in patients with cold sensitivity following hand trauma.

Methods:

Repeated measures study design, adults > 3 months after hand trauma

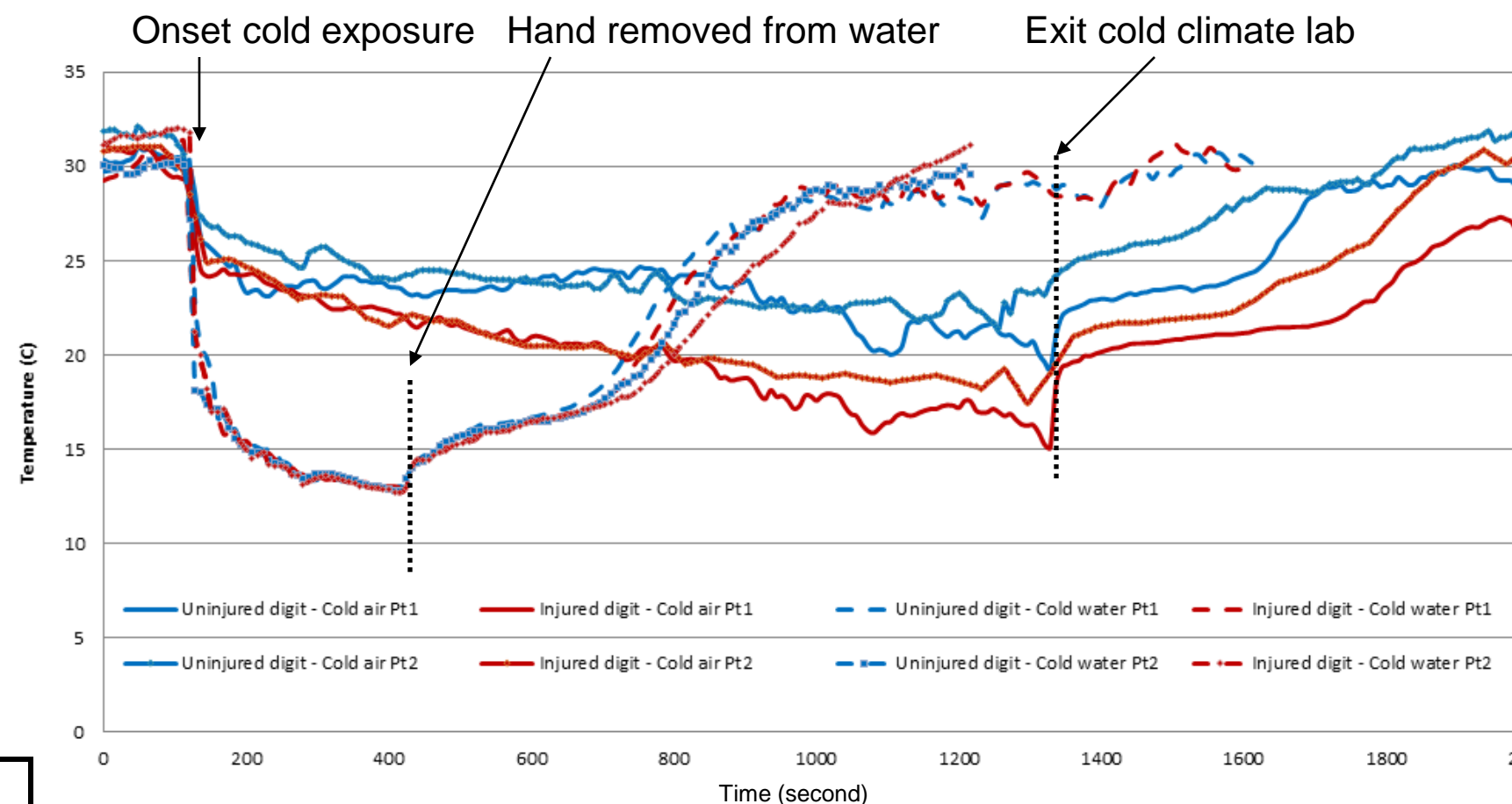
Cold stress: 1) Cold air exposure: cold climate chamber 20 min @ 1°C. 2) Cold water immersion: hands in 5 min @ 12°C water. Baseline & recovery were 20 min

Assessment: continuous skin temperature (thermistor tips in direct contact with skin at a sampling rate of 8-sec intervals)

Results: Lowest Digit Temperature (°C) in Air Vs. Water (preliminary data, n = 2)

	Pt1 Injury	Pt1 No injury	Pt2 Injury	Pt2 No Injury	Mean Difference Inj - Uninj
Air	15.1	19.3	17.4	21.4	- 4.1
Water	13.0	13.0	12.7	12.8	- .05

Results: Pattern of Skin Temperatures in Cold Water vs. Air



Conclusions:

Cold sensitivity after hand trauma assessed by cold air exposure identified skin temperature changes not seen with cold water immersion. This pilot study indicates that cold air exposure may be a better method to induce cold stress to assess cold sensitivity.