

# Paramedic – Evidence Based Medicine (P-EBP) Program

## Paramedic CAT (Critically Appraised Topic) Worksheet

**Title:** Therapeutic Hypothermia in patients experiencing spinal cord injury.

**Report By:** Adam Droski

**2<sup>nd</sup> Party Appraiser:** Jen Greene

**Clinical Scenario:**

30 year old male patient experiencing neck/back pain, tingling, numbness, and diminished movement in extremities after a hit suffered during a hockey game. Patient is immobilized by paramedics and transported to ER, where therapeutic hypothermia was induced at 34C. Hypothermia is intended to decrease edema and ischemia to the spinal cord after injury and improve neurological outcomes.

**PICO (Population – Intervention – Comparison – Outcome) Question:**

In patients with spinal cord injury, does the induction of hypothermia, compared with normothermia, improve end neurological function?

**Search Strategy:**

(Hypothermia) AND (spinal cord injury)

limits: 5 years

**Search Outcome:**

205 articles

**Relevant Papers:**

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/WEAKNESSES
2012 R. Hansebout	20 patients with a neurologically complete spinal cord injury to begin hypothermia within 8 hours of injury.	LOE 3	Change in American Spinal Injury Association (ASIA) Impairment Scale.	35% remained ASIA Grade A,  30% improved to ASIA Grade B  25% to ASIA Grade C.	-Could have used different methods of cooling. -Could have been more detailed about MOI (ie type of trauma) -Tried cooling before first 8 hours.
A. Maybhathe,	21 female Lewis rats with spinal cord contusion at thoracic vertebrae T8 11 rats controlled with hypothermia therapy	Prospective Operational Animal study  LOE 3	Changes in somatosensory evoked potentials (SSEPs) and	The two groups showed a significant difference in motor activity	-Could have studied effects of full cord laceration.  -Controlled

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			standard motor behavioral tests between the group treated with hypothermia and the normothermic group.	1–4 days after injury with higher SSEP amplitudes in the hypothermia group ( $p < 0.002$ ).	animal study.
A.Cappuccino	Article Case Study: 1 A professional football player sustained a fracture dislocation of C3-C4 while making a tackle in a game. He was noted to have complete motor paralysis and lack of sensation to pinprick, light touch, and hot and cold below his neck	Case study LOE 3	After receiving systemic hypothermic interventions (including iced saline infusion and ice packs to axillae and groins),this patients ASIA score was evaluated	This patient improved from an ASIA score of B to D.	-Good case study that shows application of hypothermia in SCI, and the role EMS and ER personal can have in active/passive cooling of an SCI patient.

**Comments:**

-Last article was a case study, showing effects of hypothermia in a sports related SCI. (Which is the second most common cause of SCI)

**Consider:** *Why would you NOT change practice, based on this article?*

Although there is evidence to support therapeutic hypothermia will improve neurological outcome in the SCI patient, there are still many internal studies that should be done before a protocol is implemented. Most studies were in a controlled setting, and the possible adverse effects of hypothermia have not been addressed in most studies.

I would support the implementation of hypothermia in the SCI patient, only after a controlled study has been completed and an evidence based protocol has been written. I do however believe that therapeutic hypothermia has the potential to be beneficial to patients experiencing SCI.

**Clinical Bottom Line:**

# Paramedic – Evidence Based Medicine (P-EBP) Program

There is sufficient evidence that shows therapeutic hypothermia has promise to improve neurological outcome in patients with SCI.

## References:

Hanesbout R., Hanesbout C., Local cooling for traumatic spinal cord injury: outcomes in 20 patients and review of the literature. *J of Neurosurg*, 2014; 20: 5: 550-561

Maybhate A., Hu, C., Bazley, F., Yu, Q., Thakor NA., Kerr, C., All, A., Potential long-term benefits of acute hypothermia after spinal cord injury: Assessments with somatosensory-evoked potentials". *Critical Care Medicine*, 2011; 40; 2; 573-579 .

Cappuccino A., Moderate Hypothermia as Treatment for Spinal Cord Injury. *Orthopedics Journal*, 2008; 31: 3