HazMat Pe Entry & Rehab

Prehospital goal: To properly manage exertional heat stress and fatigue

Indications: Complete pre-entry screening and post entry rehab for any technician donning chemical or vapor resistant PPE

Pre-entry surveillance: Complete for all individuals wearing chemical liquid, splash, and vapor protective clothing in either the hot or warm zones. Technicians performing decontamination in PPE for extended periods of time should also be monitored.

Pre Entry	→	**Post Entry**
Vital Signs Skin:Examine skin for rashes, open sores, and wounds. Mental status: Individual should be alert and oriented with normal gait and clear speech Medical history Document new medications since last team physical including OTC. Document alcohol consumption over past 24 hours and ANY illness over the past 72 hours. Weight: Document weight wearing pants with empty pockets, shirt, and socks.: Hydration: Provide the subject with 8 – 16 oz. of sport drink or sport drink diluted 50% with water. Document any volume consumed after weighing.		Monitor Blood Pressure (subject seated) Pulse (pulse oximeter acceptable) Oral Temperature Skin evaluation Examine the exposed skin for burns, redness, and wounds Mental status Individual should be alert and oriented with normal gait and clear speech. Weight: Document weight wearing pants with empty pockets, shirt, and socks.:

Rehab sector goals:

Shelter: Consider the elements. Avoid extremes of heat, cold, or high humidity. If possible, establish the rehab sector out of sight of the incident.

Rest: Most studies have shown that temperature may not return to baseline temperature after 20-minutes of rehab even with active cooling and rehydration. If manpower allows, extend rehab to 30 minutes or reduce work times before returning to the rehab sector.

Provide hydration

Provide temperature correction

Provide food for long duration incidents

Any technician with an estimated core temperature greater than 103°F (39.4°C) with signs and symptoms of exertional heat illness should immediately receive 1 – 2 liters of 0.9 NS IV and be transported to the emergency department. Consider cold water immersion followed by rapid transport and intravenous fluids for any firefighter with a core temperature over 104°F (40°C). Confirm this temperature rectally if possible

Technician may redon PPE if appropriate rehydration has occurred and the following vital sign criteria are met.

Heart rate < 100
Systolic BP between 100 and 160
Diastolic BP < 90
Oral temperature < 98.6°F (37°C)

Notes:

Pre Entry Vital Signs
Pulse: deny entry of greater than 70% of age predicted max: (220 – age)*0.7
Blood pressure: deny entry if diastolic BP > 105
Respiratory rate: deny entry if greater than 24/min]
Temperature (oral): deny entry if greater than 99.5°F

New Medications
☎ Certain medications affect hear rate response and thermoregulation. Contact medic command before donning PPE if any new medications are identified. *The subject must be cleared by physician prior to donning PPE*.

Hydration: Calculate sweat rates using the following. Note: weights must be in kg and assumes no urine has been excreted or fluids consumed

[(Pre entry weight (kg) – Post entry weight (kg) + 1) * 1000] = ml fluid replacement needed

Oral fluid replacement should be 110-150% (multiplication factor of 1.1 - 1.5) of the amount lost in PPE to return to baseline. Optimally, the full replacement volume should be consumed before re-donning PPE. If this is not possible, 50% should be consumed on scene in addition to meeting vital sign criteria to return to the incident. The total replacement volume lost should be consumed during the same day.

Example:

Pre entry weight = 61.7 kg
Post entry weight = 61.3 kg
90 minutes in PPE

61.7 – 61.3 + 1 = 1.4
1.4 * 1000 = 1400 mL lost by sweat
1400 * 1.1 = 1540 mL or (2100 mL for 1400*1.5) of *oral* fluids **OR** 1400 mL 0.9NS *IV* fluids

- Consider providing intravenous fluids for subjects with symptoms of exertional heat illness.
- 1.5 to 2.0 liters of room temperature fluid should provide 0.5°C reduction in core temperature
- If available, a rapid infusion of one liter of cold (4°C) saline should provide 1.0°C reduction in core temperature. *Note: Rapid cold saline infusion can be uncomfortable in hyperthermic individuals and should only be used to treat true heat emergencies*.

Cooling: Remove all PPE after decontamination.

In hot environments (>90°F or 32°C) or in high humidity employ active cooling (e.g. forearm immersion). Cold towels and misting fans can be used to increase technician comfort but are unlikely to result in significant additional cooling.

Do ***not*** use fans when temperatures exceed 95°F (35°C) as this may inhibit thermoregulation.
Do ***not*** use fine water mist in high humidity (> 70% RH)

Passive cooling in moderate temperature (approximately 72°F or 22°C) and low humidity is an efficient means of cooling individuals. Air-conditioned vehicles (e.g. fire apparatus, ambulance, bus) or portable shelters can be used to create an optimal environment.

Quality Indicators

Response to Therapy	Temperature correction	Adverse Effects	Provision of adequate hydration