

# Serotonin Toxicity

## Section 1: Case Summary

<b>Scenario Title:</b>	
Keywords:	Serotonin syndrome, drug-induced hyperthermia, rhabdomyolysis
Brief Description of Case:	A 42-year-old female is brought to the ED by EHS with acute confusion and agitation following an intentional ingestion. The presentation is consistent with a diagnosis of serotonin syndrome, complicated by hyperthermia and status epilepticus.

Goals and Objectives	
Educational Goal:	The aim of this case is for learners to develop a rapid management and diagnostic approach to the patient presenting with altered mental status and an elevated temperature.
Objectives: (Medical and CRM)	<ol style="list-style-type: none"> <li>1. Demonstrate an initial approach to the acutely altered patient, prioritizing the primary survey.</li> <li>2. Develop an appropriate differential diagnosis for the “hot and altered” patient.</li> <li>3. Differentiate between hyperthermia and a fever.</li> <li>4. Identify the intentional ingestion of prescribed medications and recognize the presentation as serotonin syndrome.</li> <li>5. Differentiate serotonin syndrome from neuroleptic malignant syndrome and other toxidromes that can cause hyperthermia.</li> <li>6. Identify potential complications of serotonin syndrome and work up appropriately.</li> <li>7. Initiate supportive management of serotonin syndrome through rehydration, active cooling, and agitation management.</li> <li>8. Review indications, administration, and availability of cyproheptadine.</li> <li>9. Review techniques for actively cooling a hyperthermic patient.</li> </ol>
EPAs Assessed:	

Learners, Setting and Personnel			
Target Learners:	<input checked="" type="checkbox"/> Junior Learners	<input checked="" type="checkbox"/> Senior Learners	<input type="checkbox"/> Staff
	<input checked="" type="checkbox"/> Physicians	<input type="checkbox"/> Nurses	<input type="checkbox"/> RTs
	<input type="checkbox"/> Inter-professional		
	<input type="checkbox"/> Other Learners:		
Location:	<input checked="" type="checkbox"/> Sim Lab	<input type="checkbox"/> In Situ	<input type="checkbox"/> Other:
Recommended Number of Facilitators:	Instructors: 2		
	Sim Actors: 1		
	Sim Techs: 1		

Scenario Development	
Date of Development:	March 2026
Scenario Developer(s):	Ashlyn Kopanski
Affiliations/Institutions(s):	UBC CCFP (EM)



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Contact E-mail:	
Last Revision Date:	
Revised By:	
Version Number:	



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## Section 2A: Initial Patient Information

A. Patient Chart					
Patient Name: Emily Kim		Age: 42	Gender: F	Weight: 70 kg	
Presenting complaint: Confusion					
Temp: 40.5	HR: 139	BP: 160/108	RR: 24	O <sub>2</sub> Sat: 95	FiO <sub>2</sub> : RA
Cap glucose: 4.5			GCS: 11 (E4 V2 M5 )		
Triage note: Brought in by EHS, direct to trauma bay. Found down at home by her partner altered. Increasing agitation en route.					
Allergies: None					
Past Medical History: Hypertension Depression Anxiety Insomnia			Current Medications: Ramipril Citalopram Trazodone		

## Section 2B: Extra Patient Information

A. Further History
<p><i>Include any relevant history not included in triage note above. What information will only be given to learners if they ask? Who will provide this information (mannequin's voice, sim actors, SP, etc.)?</i></p> <p>EMR Review: Multiple community mental health reports. Pharmacy review reveals prescription renewals recently filled.</p> <p>Partner (Fred or Lisa):</p> <p>Fred/Lisa came home from work this evening and found Emily confused in the living room. They last saw her normal this morning approximately 9 hours ago. They have never seen her like this before. They found some empty pill bottles at home and brought them in when they arrived at the ED. They are not sure how full the bottles were.</p> <p>Emily has been quite stressed lately. She was fired from her job this week. She also recently got into an argument with her son, who she is not in regular contact with.</p> <p>Otherwise, she has been feeling well prior to today. No recent trauma. No fevers. No recent medication changes as far as he is aware. No prior intentional ingestions or suicide attempts. No family history of suicide.</p> <p>She drinks 1-2 glasses of wine every day. No smoking or other substance use.</p>
B. Physical Exam



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<i>List any pertinent positive and negative findings</i>	
Cardio: Tachycardic. Normal S1S2 with no EHS and no murmurs.	Neuro: GCS 11. Agitated. Ocular clonus. Mild rigidity to upper extremities. Rigid and hyperreflexic lower extremities with bilateral inducible ankle clonus.
Resp: Tachypneic. GAEB. No adventitious lung sounds.	Head & Neck: Unremarkable. No nuchal rigidity.
Abdo: Soft, non-tender. Hyperactive bowel sounds.	MSK/skin: Diaphoretic. No bruising or trauma. No rashes.
Other:	



# Serotonin Toxicity

## Section 3: Technical Requirements/Room Vision

A. Patient
<input checked="" type="checkbox"/> Mannequin ( <i>adult</i> )
<input checked="" type="checkbox"/> Standardized Patient ( <i>patient's partner</i> )
<input type="checkbox"/> Task Trainer
<input type="checkbox"/> Hybrid
B. Special Equipment Required
Empty pill bottles Cooling aids: <ul style="list-style-type: none"><li>- evaporative cooling with wet towels and fans</li><li>- ice packs</li><li>- body bag and buckets filled with ice for cold water immersion</li></ul> Crash cart Airway equipment for intubation
C. Required Medications
IV fluids Benzodiazepines Sedation and induction agents for intubation
D. Moulage
Diaphoresis
E. Monitors at Case Onset
<input type="checkbox"/> Patient on monitor with vitals displayed <input checked="" type="checkbox"/> Patient not yet on monitor
F. Patient Reactions and Exam
<i>Include any relevant physical exam findings that require mannequin programming or cues from patient (e.g. - abnormal breath sounds, moaning when RUQ palpated, etc.) May be helpful to frame in ABCDE format.</i>  A - Normal. B - Tachypneic. Normal breath sounds. C - Tachycardic, hypertensive. D - Ocular clonus, inducible ankle clonus. Moaning, localizing pain, eyes open spontaneously. E - N/A.



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## Section 4: Sim Actor and Standardized Patients

<b>Sim Actor and Standardized Patient Roles and Scripts</b>	
<i>Role</i>	<i>Description of role, expected behavior, and key moments to intervene/prompt learners. Include any script required (including conveying patient information if patient is unable)</i>
Fred/Lisa	<p>Fred/Lisa is the patient's partner.</p> <p>They come into the resuscitation room shortly after the patient is brought in and once the learners have begun to discuss a differential diagnosis.</p> <p>Fred/Lisa are upset and concerned about their partner. They state that they left for work this morning and Emily was acting completely normally. They bring in empty pill bottles that they found in the bathroom once the paramedics left the house. They are not sure how many tablets were in each bottle.</p> <p>Empty pill bottles: Citalopram 40mg daily Venlafaxine XR 75 mg daily (old Rx) Trazodone 50mg qHS prn</p>



# Simulation Scenario Template

## Section 5: Scenario Progression

Scenario States, Modifiers and Triggers				
Patient State/Vitals	Patient Status	Learner Actions, Modifiers & Triggers to Move to Next State		Facilitator Notes
<b>1. Baseline State</b> Rhythm: sinus tachy HR: 139 BP: 160/108 RR: 24 O <sub>2</sub> SAT: 93% T: 40.5 °C GCS: 11 (E4V2M5) Gluc: 4.5	Is the patient alert? In distress? Seizing? What symptoms do they currently have?  Patient is altered, moaning, localizing pain and eyes open spontaneously.	<u>Expected Learner Actions</u> <input type="checkbox"/> Monitors, pads on chest <input type="checkbox"/> IV access <input type="checkbox"/> Bolus IV fluids <input type="checkbox"/> Supplemental O <sub>2</sub> <input type="checkbox"/> Check POC glucose <input type="checkbox"/> Primary assessment <input type="checkbox"/> Focused history and physical <input type="checkbox"/> POCUS <input type="checkbox"/> Collateral from EMR	<u>Modifiers</u> Changes to patient condition based on learner action - O <sub>2</sub> sat improves to 99% if placed on nasal prongs - HR improves to 120 if given 1L IVF bolus  <u>Triggers</u> For progression to next state - Identifies AMS, hyperthermia, and clonus	Withhold the medication ingestion information until partner arrives to ED to allow learners to keep a broad differential.  Pertinent physical exam findings: GCS 11. Rigid and hyperreflexic lower extremities with bilateral inducible ankle clonus. Ocular clonus (Facilitator could show video of ocular clonus or program mannequin to depict this)
<b>2. Initial Workup</b> Rhythm: sinus tachy HR: 120 BP: 163/110 RR: 24 O <sub>2</sub> SAT: 99% on NP T: 40.5 °C (Ax) <b>41.2 °C (core temp)</b> GCS: 11 (E4V2M5)	Remains altered with same GCS and similar vital signs.	<u>Expected Learner Actions</u> <input type="checkbox"/> Consider differential <input type="checkbox"/> Investigations (BW, ECG, UA, CXR +/- CT head once stable) <input type="checkbox"/> Collateral history from partner <input type="checkbox"/> Diagnose serotonin syndrome <input type="checkbox"/> Administer benzodiazepine <input type="checkbox"/> Core temperature <input type="checkbox"/> Call poison centre	<u>Modifiers</u>  <u>Triggers</u> - Collateral obtained - Check the core temperature - Call poison centre - Serotonin syndrome diagnosed	Learners may give IV antibiotics and/or naloxone with no change to the patient's status.  Avoid antipyretics.  <b>Poison centre call:</b> Advise high risk for serotonin syndrome based on medications. Ask about clonus, QRS, QTc, core temperature. Supportive care with benzos, IVF and cooling if core temp > 40 are main priorities. Cyproheptadine is adjunctive only, and can only be administered PO.



# Simulation Scenario Template

<p><b>3. Active Cooling</b>  Rhythm: sinus tachy  HR: 125  BP: 140/100  RR: 24  O<sub>2</sub>SAT: 99% on NP  T: 40.5 °C (Ax)  41.2 °C (core temp)  GCS: 11 (E4V2M5)</p>	<p>Remains altered with same GCS and similar vital signs.</p>	<p><u>Expected Learner Actions</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Rapid cooling</li> <li><input type="checkbox"/> Core temperature monitoring</li> <li><input type="checkbox"/> Bloodwork, ECG and CXR results interpreted</li> <li><input type="checkbox"/> Initiate large volume fluid resuscitation</li> <li><input type="checkbox"/> Monitor UO</li> </ul>	<p><u>Modifiers</u></p> <ul style="list-style-type: none"> <li>- If rapid cooling initiated → core temperature will reduce to 40 °C</li> </ul> <p><u>Triggers</u></p> <ul style="list-style-type: none"> <li>- Cooling initiated</li> <li>- Rhabdomyolysis identified</li> </ul>	<p>Cold water immersion is the gold standard for rapid cooling. Cooling is continued until a core temperature of 39°C to avoid overshoot hypothermia. Foley probe is the preferred method for core temperature monitoring.</p> <p>Critical lab result: CK 9, 789.</p> <p>Rhabdo: High volume IV fluid resuscitation with goal UO 200-300 cc/hr (2-3 cc/kg/hr).</p> <p>ECG: sinus tachycardia with prolonged QT and normal QRS. Learners may administer MgSO<sub>4</sub> for prolonged QTc with no change.</p>
<p><b>4. Decline</b>  Rhythm: sinus tachy  140  RR: 24  O<sub>2</sub>SAT: 90% on NP  T: 40 °C  Gluc normal</p>	<p>After cooling initiated, the patient becomes increasingly rigid and agitated.</p> <p>Begins seizing and vomits.</p>	<p><u>Expected Learner Actions</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Benzodiazepine IV</li> <li><input type="checkbox"/> Recovery position</li> <li><input type="checkbox"/> Suction emesis</li> <li><input type="checkbox"/> Recheck POC glucose</li> <li><input type="checkbox"/> Identify need for intubation</li> </ul>	<p><u>Modifiers</u></p> <ul style="list-style-type: none"> <li>- Seizing persists after second dose of benzo</li> </ul> <p><u>Triggers</u></p> <ul style="list-style-type: none"> <li>- Benzodiazepines administered</li> </ul>	<p>Repeat glucose is normal.</p> <p>No change to seizure activity if anti-epileptic administered.</p>
<p><b>5. Intubation</b>  Rhythm: sinus tachy  HR: 140  BP: 139/98  RR: 20  T: 40 °C</p>	<p>Actively seizing.</p>	<p><u>Expected Learner Actions</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare airway equipment/medications</li> <li><input type="checkbox"/> Verbalize airway plan</li> <li><input type="checkbox"/> Intubate</li> </ul>	<p><u>Modifiers</u></p> <ul style="list-style-type: none"> <li>- Seizing stops with induction and paralytic</li> </ul> <p><u>Triggers</u></p> <ul style="list-style-type: none"> <li>- Intubation completed</li> </ul>	<p>Propofol preferred for post-intubation sedation.</p> <p>Avoid succinylcholine for intubation in severe</p>



# Simulation Scenario Template

				hyperthermia/rhabdomyolysis due to hyperkalemia risk.  Pausing cold water immersion for airway control and switching to an alternative cooling method is reasonable temporarily.
<b>6. Disposition</b> Rhythm: sinus tachy HR: 115 BP: 140/95 RR: 20 O <sub>2</sub> SAT: 99% intubated T: 39.2 °C GCS: 3T	Intubated and sedated.	<u>Expected Learner Actions</u> <input type="checkbox"/> Patient stabilized <input type="checkbox"/> Place on involuntary psychiatric admission (eg. Form 4.1) <input type="checkbox"/> Consult ICU	<u>Modifiers</u>  <u>Triggers</u> - Handover to ICU to end case	



# Simulation Scenario Template

## Appendix A: Laboratory Results

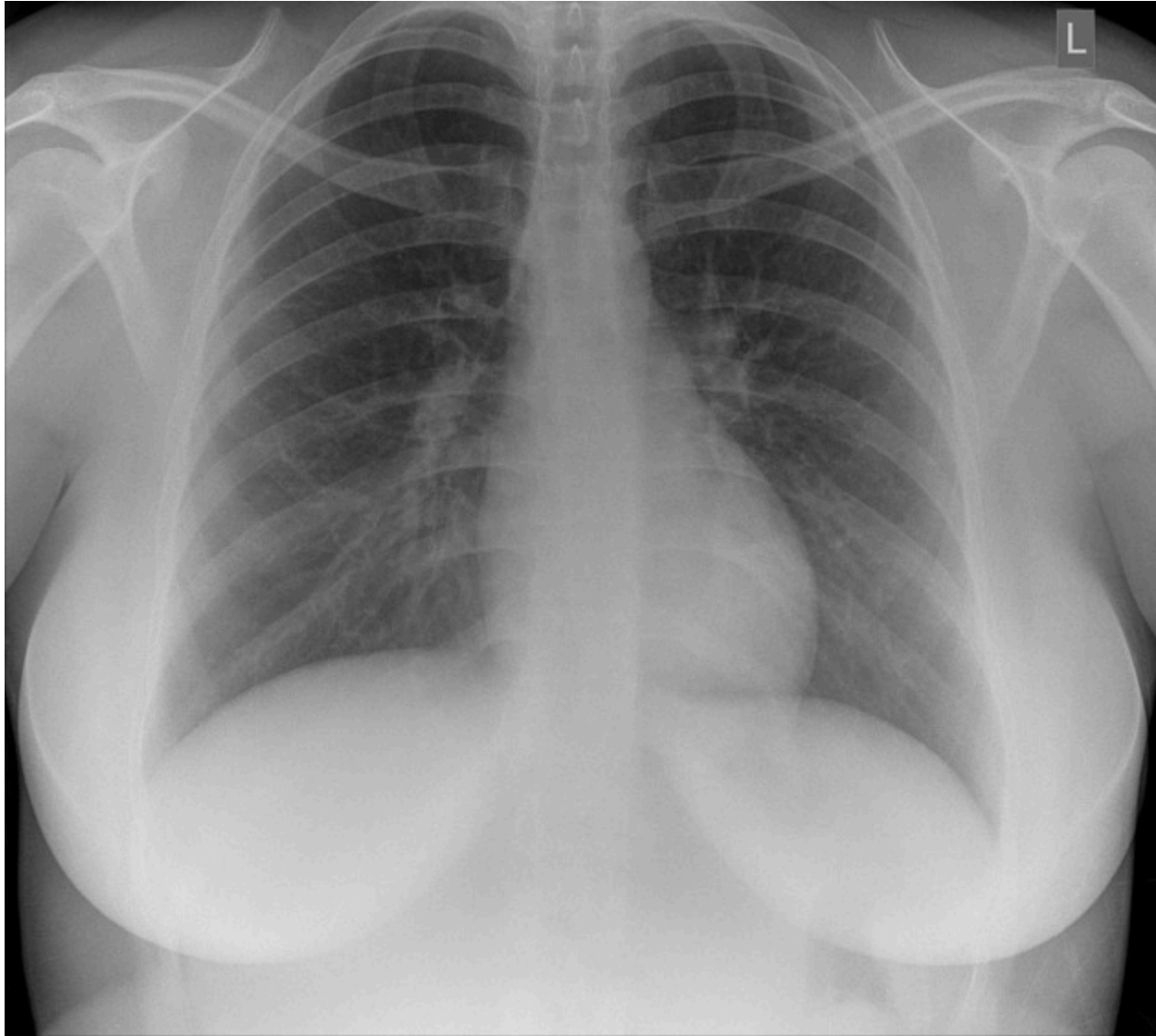
<p><u>CBC</u> WBC - 14.9 Hgb - 135 Plt - 360</p> <p><u>Lytes</u> Na - 132 K - 5.0 Cl - 102 HCO<sub>3</sub> - 18 AG - 18 Urea - 7.5 Cr - 100 Glucose - 4.5 CK - 9, 789</p> <p><u>Extended Lytes</u> Ca - 2.10 Mg - 0.80 PO<sub>4</sub> - 1.30 TSH - normal</p> <p><u>VBG</u> pH - 7.28 pCO<sub>2</sub> - 33 HCO<sub>3</sub> - 18 Lactate - 3.5</p>	<p><u>Cardiac/Coags</u> Trop - 10 INR - 1.0 PTT - 30</p> <p><u>Biliary</u> AST - 65 ALT - 45</p> <p><u>Tox</u> EtOH - negative ASA - negative Tylenol - negative Serum Osmolality - 290</p> <p><u>Other</u> B-HCG - negative</p>
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# Simulation Scenario Template

*Paste in any auxiliary files required for running the session. Don't forget to include their source so you can find them later!*



*Figure 2: CXR*

## Appendix C: Facilitator Cheat Sheet & Debriefing Tips



# Simulation Scenario Template

Include key errors to watch for and common challenges with the case. List issues expected to be part of the debriefing discussion. Supplemental information regarding any relevant pathophysiology, guidelines, or management information that may be reviewed during debriefing should be provided for facilitators to have as a reference.

## Linking Objectives to the Debrief:

- 1. Demonstrate an initial approach to the acutely altered patient, prioritizing the primary survey.**
  - How did this go during the simulation? What was your initial impression and approach?
- 2. Develop an appropriate differential diagnosis for the “hot and altered” patient.**
  - Consider using the mnemonic **DIMES**
  - <https://first10em.com/hot-altered-2/>

## “Hot and Altered” Differential

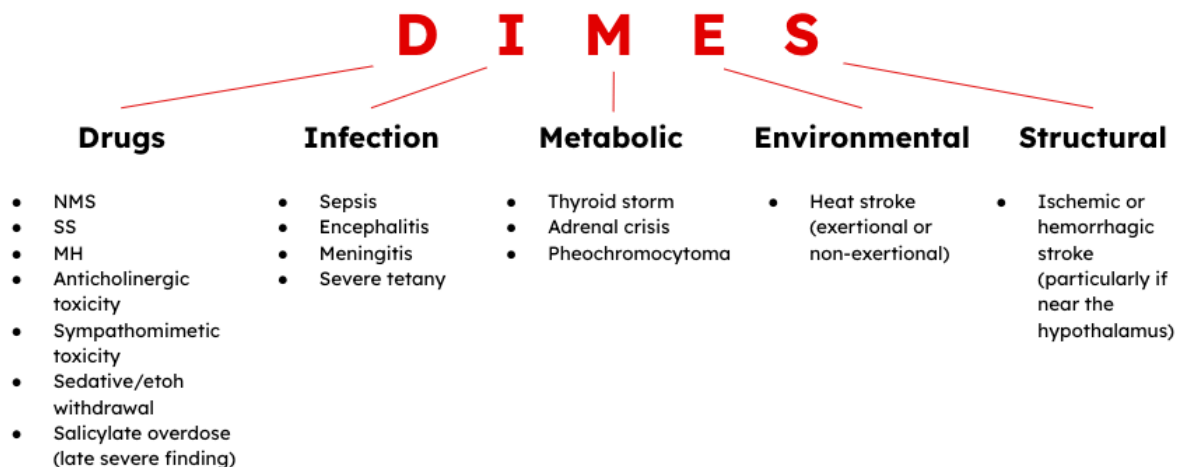


Figure 3: Hot and Altered Differential

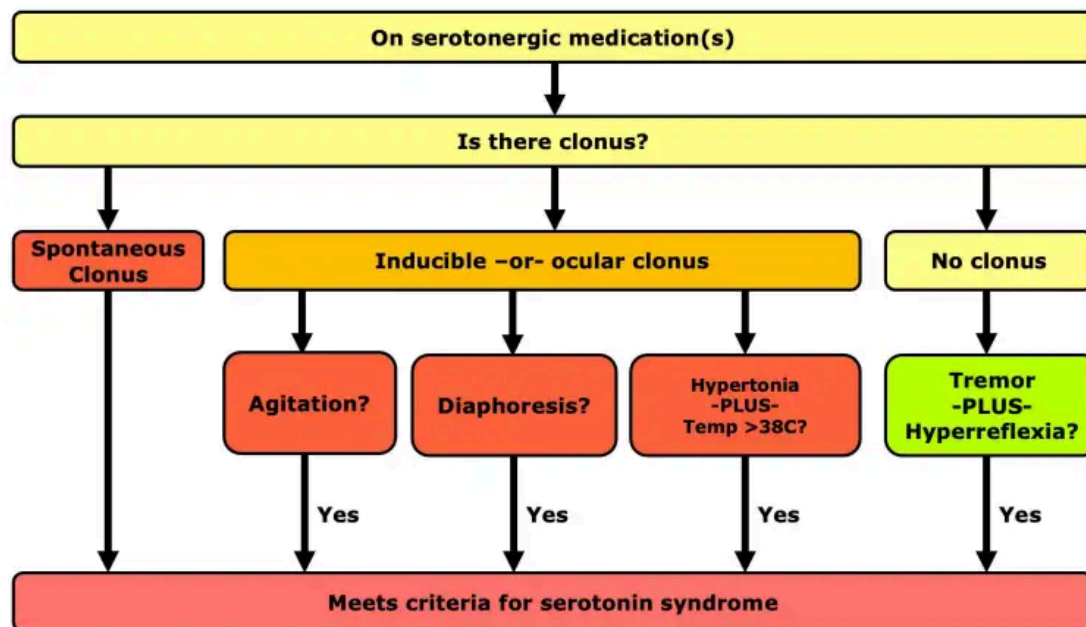
- 3. Differentiate between hyperthermia and a fever.**
  - Fever = elevation of the brain’s thermoregulatory set point induced by pyrogenic cytokines (eg. infection)
  - Hyperthermia = temperature elevation due to uncontrolled heat generation and/or inadequate heat dissipation (eg. drug-induced, heat stroke)
  - Fever will respond to antipyretics whereas hyperthermia will not.
- 4. Identify the intentional ingestion of prescribed medications and recognize the presentation as serotonin syndrome.**
  - How did you come to the diagnosis of serotonin syndrome?
  - Etiologies of serotonin syndrome:



# Simulation Scenario Template

- Interaction between multiple serotonergic medications
- Large overdose of serotonergic medication(s)
- Accumulation of serotonergic medication(s) due to renal dysfunction
- Serotonergic medications:
  - Psychiatric medications: eg. SSRIs, SNRIs, TCAs, MAOIs
  - Antiepileptics: eg. carbamazepine, valproate, lamotrigine
  - Antiemetics: eg. metoclopramide
  - Opioids: eg. methadone, tramadol
  - Substance use: eg. cocaine, MDMA, amphetamines, LSD
  - Other: eg. linezolid, cyclobenzaprine, St. John's wort
- Diagnosis:
  - Rapid onset: typically occurs within 24 hours
  - Triad:
    1. Mental status changes
      - a. Delirium, anxiety, seizures
    2. Sympathetic hyperactivity
      - a. Hyperthermia, tachycardia, hypertension, diaphoresis
    3. Neuromuscular hyperactivity
      - a. Tremor, hyperreflexia, clonus, rigidity

## Hunter Criteria for Serotonin Syndrome



Schematic for the various ways to satisfy the Hunter Criteria for serotonin syndrome.

-Internet Book of Critical Care

Figure 4: Hunter Criteria for the diagnosis of Serotonin Syndrome

<https://emcrit.org/ibcc/serotonin/#top>

- Video of serotonin syndrome physical exam findings (clonus, hyperreflexia, ocular clonus, etc):  
<https://www.youtube.com/watch?v=Ldhv2VoEXZs>



# Simulation Scenario Template

## 5. Differentiate serotonin syndrome from neuroleptic malignant syndrome and other toxidromes that can cause hyperthermia.

Table 1: Clinical Features of Hyperthermia Toxidromes

Toxidrome	Serotonin Syndrome	Neuroleptic Malignant Syndrome	Anticholinergic	Sympathomimetic
<b>Typical Agents</b>	Serotonergic agents (eg. SSRIs, SNRIs, MAOIs, stimulants)	Dopamine antagonists (eg. antipsychotics)	Anticholinergics (eg. atropine, scopolamine, antihistamines, TCAs)	Stimulants (eg. MDMA, cocaine, amphetamines)
<b>Timeline of Toxicity</b>	Within 24 hours (often rapid)	Slower onset (typically 1-3 days), can occur at anytime	Rapid	Rapid
<b>Temperature</b>	↑	↑↑	↑	↑
<b>HR</b>	↑	↑	↑	↑
<b>BP</b>	↑	↑	↑	↑
<b>Skin</b>	Diaphoresis	Diaphoresis	<b>Dry, flushed</b>	Diaphoresis
<b>Pupils</b>	Mydriasis	Normal	Mydriasis	Mydriasis
<b>Mental Status</b>	Agitation, delirium	Delirium, obtunded	Agitation, delirium	Agitation, paranoia
<b>Muscle Tone</b>	Hypertonia (lower limbs > upper limbs)	<b>Severe “lead-pipe” rigidity</b>	Normal or ↓	Normal or mild ↑
<b>Reflexes</b>	<b>Hyperreflexia (esp lower limbs)</b>	Normal or hyporeflexia	Normal	Normal or ↑
<b>Clonus</b>	++	-	Rare, +/-	May be present

## 6. Identify potential complications of serotonin syndrome and work up appropriately.

- Potential complications of serotonin syndrome include:
  - Hyperthermia
  - Agitation
  - Rhabdomyolysis
  - Seizures
  - Coma, death
  - ECG: changes depend on serotonergic agent (eg. prolonged QT, QRS prolongation)



# Simulation Scenario Template

- Lab abnormalities: hyperkalemia, leukocytosis, hypomagnesemia, hyponatremia, metabolic acidosis, elevated CK, DIC, renal impairment, elevated LFTs

## 7. Initiate supportive management of serotonin syndrome through rehydration, active cooling, and agitation management.

- Discontinue the offending medication/drug
- Airway protection with intubation if required
  - Indications may include significant hyperthermia (eg. > 41°C), uncontrolled agitation, status epilepticus
  - Avoid succinylcholine (hyperkalemia risk with severe hyperthermia/rhabdomyolysis)
- IV fluid resuscitation and electrolyte replacement
- Treat hyperthermia aggressively
  - Active external cooling as quickly as possible (see Table 2 below for techniques and considerations)
    - Goal cooling time = ideally within 30 minutes
  - Monitor core temperature:
    - Bladder probe ideal
    - Esophageal probe (only if intubated)
    - Rectal probe may lag in measurements
  - Discontinue cooling once core temperature reaches 38-39°C to avoid overshoot hypothermia
  - Avoid antipyretics (will not work and could worsen potential hepatic/renal injury)
- Sedation
  - IV benzodiazepines for agitation, rigidity, myoclonus, or seizures
    - May require high doses
  - Consider precedex infusion if no seizure activity
  - Persistent/refractory hyperthermia/agitation/neuromuscular hyperactivity
    - Intubate and paralyze if not already done
    - Propofol, barbiturates
    - Consider prolonged neuromuscular blockade: Rocuronium first then subsequent 1-2 boluses of vecuronium q45min
- Consider serotonin receptor blockers:
  - Cyproheptadine (see below)
  - Chlorpromazine (may cause hypotension, dystonic reactions, NMS, lower seizure threshold, and/or worsen hyperthermia)
- BC Drug and Poison Information Centre. (n.d.). *About DPIC - the BC Drug and Poison Information Centre*. <http://www.dpic.org/content/about-bc-drug-and-poison-information-centre>



# Simulation Scenario Template

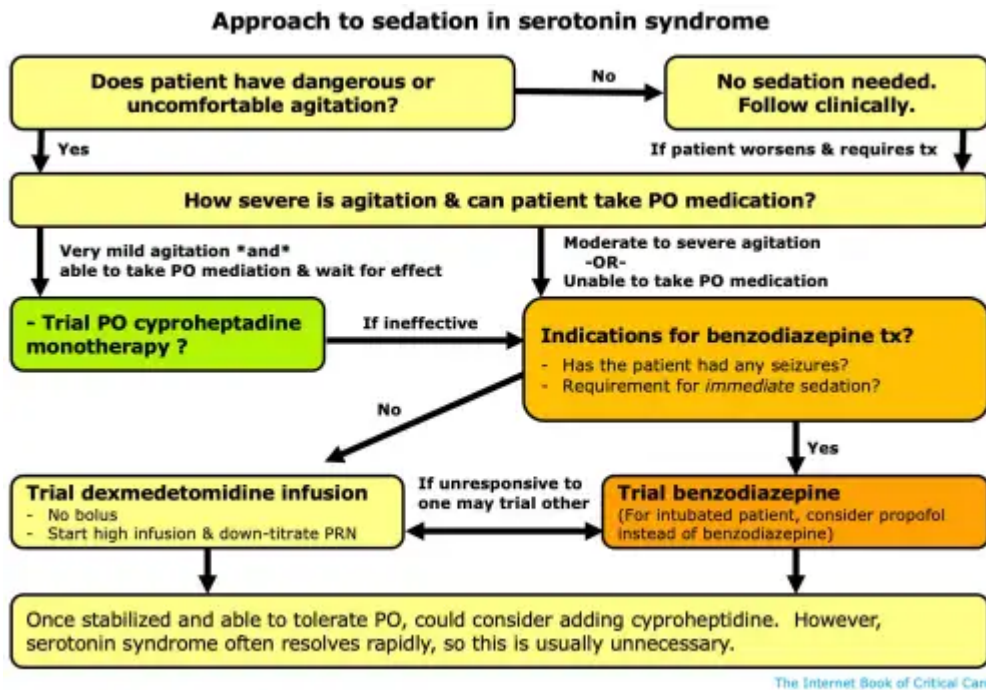


Figure 5: Sedation Management in Serotonin Syndrome  
[https://emcrit.org/ibcc/serotonin/#treatment\\_overview](https://emcrit.org/ibcc/serotonin/#treatment_overview)

## 8. Review indications, administration, and availability of cyproheptadine.

- Cyproheptadine is a first generation antihistamine with serotonin antagonist properties.
- Indications: most commonly used in cases with mild to moderate symptoms, however may be given enterally in severe cases. Decision to use this should be on a case-by-case basis and in discussion with your poison center.
- Administration: only available in oral formulation. Administer PO if tolerating or tablets can be crushed and administered via NG/OG tube if intubated.
- In consultation with Toxicologists from the BC Drug and Poison Information Centre (2026): Cyproheptadine is currently available in BC, though it is not often administered in cases of severe serotonin syndrome due to cooling and sedation being the priority. There are no specific indications for use, though it may have greater benefit in mild-moderate serotonin syndrome cases. Consultation with your local Poison Centre is recommended for up-to-date management and medication availability.

## 9. Review techniques for actively cooling a hyperthermic patient.

- Check if your department has a "hyperthermia cooling kit" and consider developing one if not.
  - Common equipment includes: quick cold packs, body bags, esophageal core temperature probes, bladder core temperature catheters.



# Simulation Scenario Template

*Table 2: Cooling Techniques for Drug-Induced Hyperthermia*

Cooling Technique	Notes
Intravascular	1L of IVF at 4°C will cool a patient by 1°C.
Ice packs	Apply ice packs surrounding the patient if enough ice packs are available. Otherwise apply to the groin, axillae, and neck.
Cooling blanket (eg. Arctic Sun or Blanketrol cooling systems)	If placed underneath the patient, it can be used in conjunction with evaporative cooling technique. Consider the set up time and delays in cooling if equipment is not readily available.
Evaporative cooling	Spray room temperature water onto the patient with fans blowing directly on patient. Rate of cooling = ~0.1°C per minute.
Immersive cooling	<b>Gold standard.</b> The fastest and most effective method for rapidly cooling a severely hyperthermic patient. Rate of cooling = ~0.2°C per minute. Options: <ul style="list-style-type: none"> <li>- <b>Cold water immersion</b> (Figure 6): Place the patient in a body bag filled with ice and water to the level of the midaxillary line.</li> <li>- <b>TACO</b> (Figure 7): Place the patient on a plastic sheet/tarp, cover the patient in ice, and either wrap the sheets closed or have 2 people gently oscillate the tarp back and forth to keep the ice circulating around the patient</li> </ul>



# Simulation Scenario Template



*Figure 6: Cold Water Immersion Set Up for Active Cooling*

*Heat stroke management updates: a description of the development of a novel in-emergency department cold-water immersion protocol and guide for implementation. (2025) Annals of Emergency Medicine.*

# Simulation Scenario Template



Figure 7: TACO Method for Active Cooling

Tucker L, Evans E. Heatstroke on the Rise: A Guide to Implementing Tarp-Assisted Cooling With Oscillation (TACO) in the Emergency Department. *Adv Emerg Nurs J.* 2023 Jul-Sep 01;45(3):210-216. doi: 10.1097/TME.0000000000000470. PMID: 37501272.

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# Simulation Scenario Template

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