Module 3
Troubleshooting/Case Studies
Alarms and Alerts

- If an alarm or alert occurs, the ARCTIC SUN® Temperature Management System will produce both an audible and visual cue
  - A screen will appear that displays: alarm or alert number, title, a description of the problem and instructions for resolving the condition
- When an alarm occurs, therapy is stopped
  - Clear the Alarm
  - Identify and resolve the problem
  - Press the green Start button to resume therapy
Patient is not cooled to target temperature

Determine if the ARCTIC SUN® temperature management system is working properly:

- Is a full kit (four pads) being used?
  - Are they the appropriate size?
  - Are Universal pads being supplemented as needed for larger patients?
- Is flow rate a minimum of 2.3 L/min?
- Is the water temperature appropriately low?
  - If water temperature is too high, what is the minimum water temperature set to?
    - To view: Check under Hypothermia or Normothermia settings (press Adjust and then More to modify low water limits)
- Was the therapy stopped?
  - Stopping the device may reset the algorithm
If machine is working properly, determine external conditions

- Is the patient shivering?
  - Arrows flashing upward on the Patient Temperature Trend Indicator reveals heat generation
- Was the temperature reading confirmed with a secondary source?
- What are the environmental conditions?
  - Is the room temperature too high?
    - Consider decreasing thermostat
  - Is the ventilator circuit heated?
    - Consider removing heated humidification

Patient temperature falls below target

• Has the patient experienced an event or received a medication which would bring the cool blood from the periphery into the core?
  – For example, administration of vasoactive medications or change in hemodynamics\(^1\)

• If the patient was shivering and received paralytics or sedatives, did the cessation of the heat generation cause the temperature to drop rapidly?

Patient temperature rises above target

- Is the patient generating heat through shivering or an infectious process?
  - Appropriate diagnostics may be required and appropriate treatment
- Is the patient experiencing seizures?¹,²,³

Overshoot

- Ensure the appropriate automatic patient control modes (e.g., Control Patient, Cool Patient or Rewarm Patient) is activated
  - The appropriate patient window and the ARCTIC SUN® Temperature Management System icon will be blinking
- Is the water warming or cooling appropriately?
  - If water temperature is too high or too low, what is the maximum or minimum water temperature set to?
    - To View: In Hypothermia or Normothermia settings (press Adjust and then More to modify water limits)
- What are the arrows on the Patient Temperature Trend Indicator doing?
- Verify the patient’s temperature is accurate with another source
- What is the flow rate on the ARCTIC SUN® Temperature Management System?
If the flow is below 2.3L/min

• Ensure that one full pad kit is used (Universal supplementation if needed)
• Check all connections and ensure they are secure and not kinked
• Look for air bubbles to assess if a pad is damaged
  – May check for damaged pad by disconnecting one pad at a time and waiting one minute; if flow increases during disconnect, replace the damaged pad with Universal Pad
The patient temperature is not displayed on the screen

- Ensure that the patient temperature probe is connected to Temp Probe 1 outlet
- Confirm correct placement of temperature probe in patient
- If using bladder temperature probe, check for adequate urine (if needed)
- Ensure that the connection between the temperature probe and the cable is secure
- Ensure the connection is not wet or moist

Ensure the patient temperature probe is functional
The patient is rewarming too quickly

- Ensure **REWARM PATIENT** is activated
  - The rewarm patient window will pulse and the **ARCTIC SUN®** Temperature Management System icon will be flashing
- Ensure warming rate is set appropriately as per Institutional protocol and/or physician’s order
- Review Patient Temperature Trend Indicator arrows to assess heat generation
  - If identify source, treat accordingly
- Ensure water temperature is responding appropriately to patient temperature fluctuations
  - As evidenced on therapy graph
Case Studies
Case Study 1

A patient is admitted to the unit and the Arctic Sun® Temperature Management System is set to cool the patient to 33°C. The patient’s starting temperature was 37.1°C, but is now 32.3°C (3 hours later). The patient was medicated at the beginning of therapy with a Versed drip. The patient started to shiver at 35.6°C and was given a bolus of Vecuronium (neuromuscular blockade). Nothing else has changed with the patient’s drug regime. He remains on low dose Vasopressin for BP control.

What questions will you ask regarding the overshoot?
Case Study 2

A patient is admitted with a temperature of 39.8°C. The staff has been attempting to cool this patient for about two hours to a target temperature of 37°C, so far the temperature has only dropped to 38.8°C.

What could be the issues?
Case Study 3

A patient in your unit is being maintained at normothermia with the ARCTIC SUN® Temperature Management System. You receive an Alarm 14.

What could be the issues?
You are cooling a patient on the ARCTIC SUN® Temperature Management System to a target temperature of 33°C. After returning from lunch break, you find the water flow has dropped to 1.7L/min.

What could be the issues?
Case Study 5

A patient is being cooled on the ARCTIC SUN® Temperature Management System to normothermia. The patient returns from a procedure, and as you walk by the room a half hour later, you notice the patient’s temperature at 37.9°C.

What could be going on?
Case Study 6

One of your colleagues calls you over to her patient’s bedside. She started rewarming her patient at 0.25°C/hr but after 2 hours, her patient has already warmed a full degree.

What could be the issues?