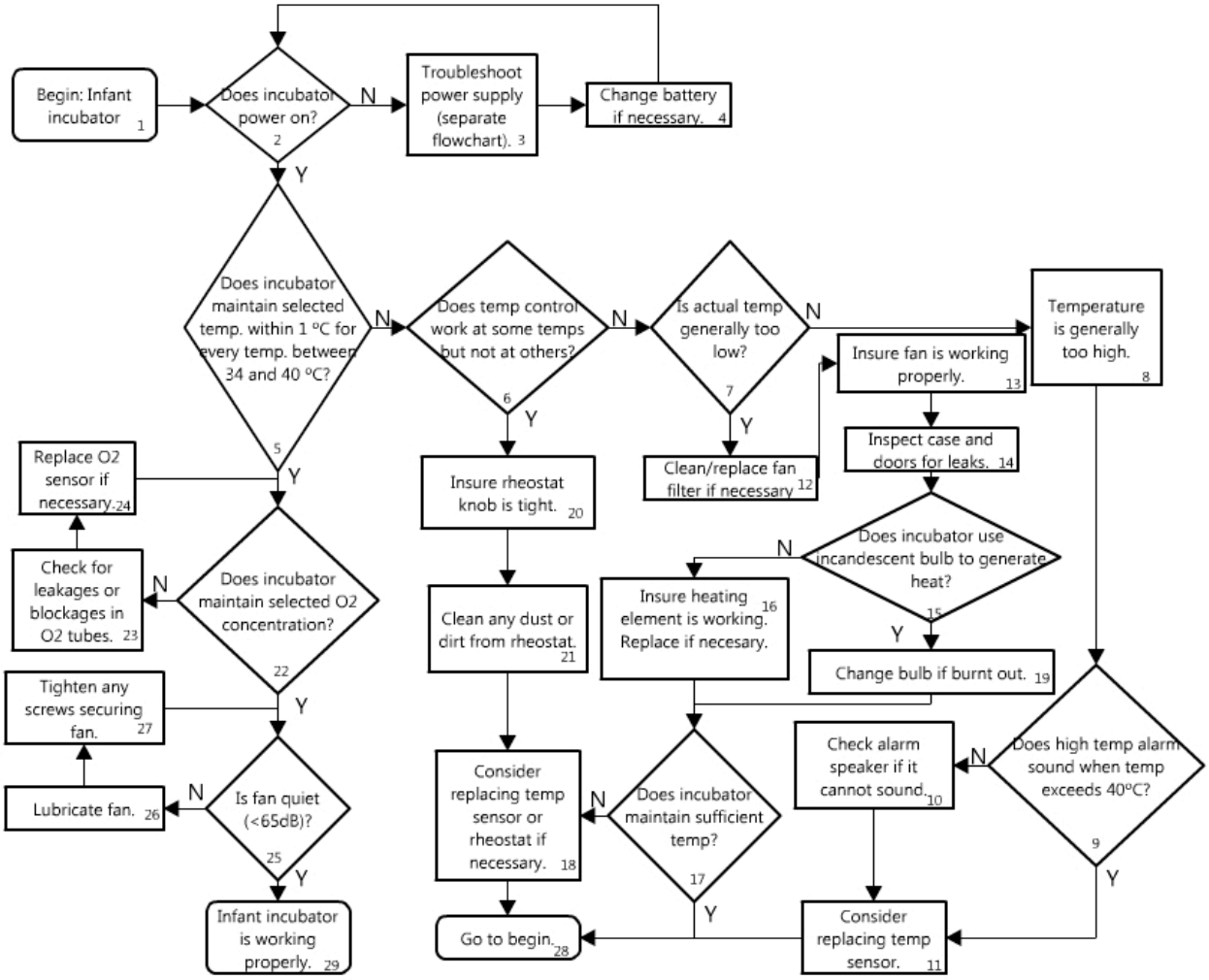
EQUIPMENT

Infant Incubator Troubleshooting

Diagnostic flowchart



#	Text box	Explanation or Comment
1	Begin: Infant incubator	Start the diagnostic process for a work order on an infant incubator.
2	Does incubator power on?	Lights, displays, and sounds are signs the device is powered on.
3	Troubleshoot power supply (separate flowchart).	Infant incubators generally have an AC-DC power supply.
4	Change battery if necessary.	If there is battery, test its ability to receive and hold a charge.
5	Does incubator maintain selected temperature within 1ºC for every temperature between 34 and 40ºC?	An infant incubator should maintain preset temperatures between 34 and 40ºC. First check if the temperature is between this range. Second, insure temperature increases and decreases with the control knob or selector. Third, insure the temperature inside the incubator is within one degree of the value set by the knob or control panel.
6	Does temperature control work at some temperatures but not at others?	The incubator does not pass the third test of controlling temperature to within one degree at all temperatures. Does the temperature increase and decrease with controls, but not maintain the correct temperature at all selected temperatures?
7	Is actual temperature generally too low?	The incubator cannot accurately control the temperature at any temperature level. Is the actual temperature generally lower than the setting?
8	Temperature is generally too high.	The incubator cannot accurately control temperature at any level and the temperature is not too low. Therefore, the temperature is too high.
9	Does high temperature alarm sound when temperature exceeds 40ºC?	Does a safety alarm sound when the actual temperature exceeds 40ºC?
10	Check alarm speaker if it cannot sound.	Insure the machine is not in silent mode. If the machine is not in silent mode and no alarm sounds at high actual temperatures, check the temperature sensor placement and the speaker.

11	Consider replacing temperature sensor.	The incubator's temperature is too high and the machine is having trouble regulating the temperature with controls. Check the connections and placement for the machine's temperature sensor. It might not be located in the correct area of the incubator to read the high temperatures. See BTA skills on electrical connections and connectors. If the technical issue cannot be resolved, consult with clinical staff. If the clinical staff approves, operate the incubator with a separate thermometer and turn the entire machine off and on to regulate the temperature and prevent overheating the infant.
12	Clean/replace fan filter if necessary.	Low temperature can result from problems with the intake fan or from leaks. Fan filter needs to be cleaned or replaced when dirty. The filter might be washable with water and detergent.
13	Ensure fan is working properly.	Use a multimeter to ensure the proper voltage reaches the fan.
14	Inspect case and doors for leaks.	Large leaks can be detected by using your hand to sense warm air escaping. Small leaks can be found by using a toothbrush to apply detergent around seals in doors and case. See BTA skills for plumbing leaks. Leaks might be repaired with sealant.
15	Does incubator use incandescent bulb to generate heat?	Some older incubators use an incandescent bulb to generate heat instead of a heating element.
16	Ensure heating element is working. Replace if necessary.	If a resistive heating element is used, measure its resistance with a multimeter and compare to manufacture specifications. The element can be replaced with any resistor with the same resistance and power ratings.
17	Does incubator maintain sufficient temperature?	Does the incubator maintain sufficient temperature after any corrective actions on the bulb or heating element?
18	Consider replacing temperature sensor or rheostat if necessary.	There might be a problem with the incubator's temperature sensor inaccurately reading the temperature. Check connections (see BTA skill on electrical connectors and connections). Consider replacing temperature sensor or rheostat.
19	Change bulb if burnt out.	If the incandescent bulb is burnt out it will need to be replaced with one with the same power rating.
20	Ensure rheostat knob is tight.	Some rheostats include a knob on the shaft attached with a set screw. Insure the set screw is tight. If the knob is broken, search for a replacement plastic knob. If replacement knob cannot be found, control the rheostat using pliers to turn the shaft.
21	Clean any dust or dirt from rheostat.	See BTA skills on cleaning and repairing switches.

22	Does incubator maintain selected O2 concentration?	O2 concentration can be measured with a sensor or with an EWH skill using locally available resources. Contact EWH for more information.
23	Check for leakages or blockages in O2 tubes.	See BTA skills on plumbing leakages and blockages.
24	Replace O2 sensor if necessary.	The O2 sensor may not be accurately reading the oxygen concentration. See BTA skills on electrical connections and connectors.
25	Is fan quiet (<65dB)?	The fan should not be excessively noisy (below 65 db). Estimate the fan noise by placing your ear where the baby's ear will be. You should be able to hear conversations in the room.
26	Lubricate fan.	A noisy fan may need lubrication. See BTA skills on motor cleaning and lubrication.
27	Tighten any screws securing fan.	A noisy fan might be unbalanced or insecure. See BTA skills on mechanical attachments.
28	Go to begin.	Restart the diagnostic process to see if the corrective measures have repaired the machine.
29	Infant incubator is working properly.	Return the machine to service via the appropriate clinical personnel.