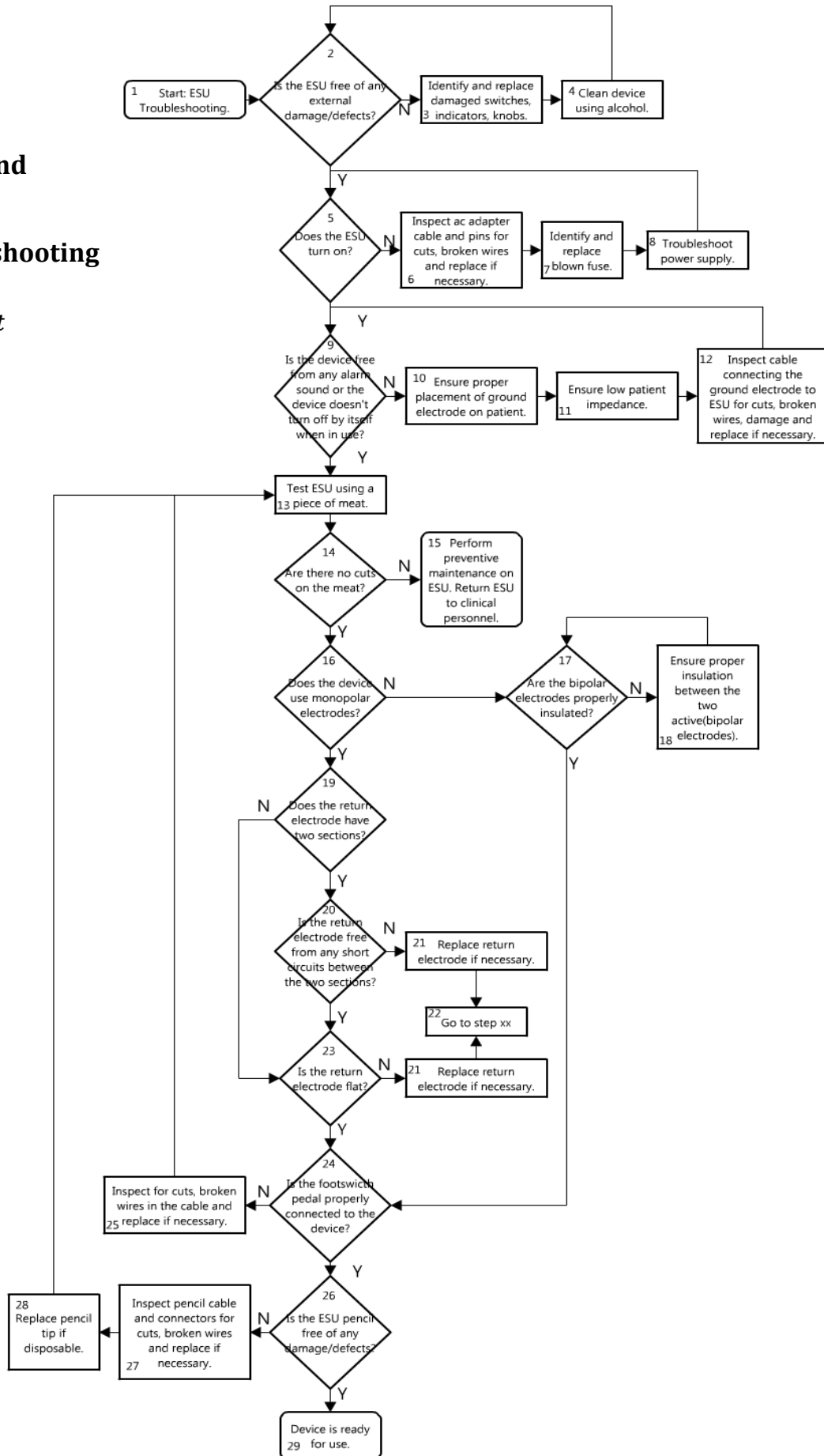


ESU

Repair and

Troubleshooting

Flowchart



Description

#	Textbox	Explanation
1	Start: ESU Troubleshooting.	Begin troubleshooting process for a work order on ESU.
2	Is the ESU free of any external damage/defects?	Check for dents, scratches and any other noticeable problems with the cover or casing.
3	Identify and replace damaged switches, indicators, knobs.	The easiest damages to fix are those on the exterior of the device. See BTA skills on Mechanical Casing and Mechanical Attachment.
4	Clean device using alcohol.	Generally, a maximum of 70% ethanol solution or clean water should be used. See BTA skills on Mechanical Cleaning.
5	Does the ESU turn on?	Check for visible signs of power reaching the device. Lights, sounds, audible motor whirring, etc are all signs that the device is receiving power.
6	Inspect AC adapter cable and pins for cuts, broken wires, and replace if necessary.	See flowchart for troubleshooting Power Supply, and se BTA skills on Power Supply and Electrical Simple.
7	Identify and replace blown fuse.	See flowchart for troubleshooting Power Supply, and se BTA skills on Power Supply and Electrical Simple.
8	Troubleshoot power supply.	See flowchart for troubleshooting Power Supply, and se BTA skills on Power Supply and Electrical Simple.
9	Is the device free from any alarm sound or the device doesn't turn off by itself when in use?	Alarms and sudden power loss are indications that the device is functioning improperly.
10	Ensure proper placement of ground electrode on patient.	
11	Ensure low patient impedance.	
12	Inspect cable connecting the ground electrode to ESU for cuts, broken wires, damage and replace if necessary.	See BTA skills on Power Supply Plug/Cable and Electrical Connections Simple
13	Test ESU using a piece of meat.	Power device as normal, attach electrode to one side of a piece of raw meat and touch ESU pencil to the meat.

14	Are there no cuts on the meat?	Burn marks or cuts underneath the pencil and return electrode are signs that the device is functioning. Lack of these marks mean that the electrodes are not being charged properly
15	Perform preventative maintenance on ESU. Return ESU to clinical personnel.	Device is ready for use.
16	Does the device use monopolar electrodes?	Monopolar electrodes are used when the generator of the device sends a current from one electrode, through tissue, and to the other. When the device uses an ESU pencil and a large, flat, metal return electrode, the device uses monopolar electrodes.
17	Are the bipolar electrodes properly insulated?	Bipolar electrodes are both contained in the tip of the ESU pencil and they pass current between them on a much smaller scale. The exterior of the bipolar electrodes must be insulated to localize energy and current transfer between the electrodes.
18	Ensure proper insulation between the two active (bipolar) electrodes.	
19	Does the return electrode have two sections?	Is the face of the return electrode segmented into two sections?
20	Is the return electrode free from any short circuits between the two sections?	Use a multimeter to measure the resistance or voltage drop between the two sections. See BTA skills on Electrical Simple.
21	Replace return electrode if necessary.	This step would require a readily available replacement part or the device cannot function.
22	Go to step 24.	Proceed to step 24.
23	Is the return electrode flat?	The return electrode must be flat in order to function properly.
24	Is the footswitch pedal properly connected to the device?	See BTA skills for Mechanical Attachment and Mechanical Casing.
25	Inspect for cuts, broken wires in the cable and replace if necessary.	See BTA skills for Electrical Connections.
26	Is the ESU pencil free of any damage/defects?	The ESU pencil is a small metal electrode. Visually and tactilely scan it for obvious damage.
27	Inspect pencil cable and connectors for cuts, broken wires and replace if necessary.	See BTA skills for Electrical Connections and Electrical Connectors.

28	Replace pencil tip if disposable.	This step hinges on the assumption that tips are readily available.
29	Device is ready for use.	Device is ready for use.