

Measures to Prevent Recurrence of ECMO Accidents

~Preventive measures and countermeasures to ECMO power supply problems~

【Abnormal ECMO shutdown】

If ECMO unexpectedly shuts down abnormally, it can be a serious problem if not handled properly. This information presents points to keep in mind and countermeasures to prevent accidents. Please refer to them for safety training.

【Points to note】

- ① Check the AC power supply drive thoroughly during daily inspections.
- ② Check that the power outlet is plugged in and that it is powered by AC power after operating on battery.
- ③ Understand the alarms (Types of alarms and their contents, set value, tone, volume, etc.)
- ④ Specify the preparations of supplies and procedures necessary for restoration in the event of an emergency shutdown.
- ⑤ Comprehend and train how to respond to an emergency shutdown.

Countermeasures

① Maintenance

- Enforce periodic device maintenance:
 - Check the charging status when the device is stored and periodically check the battery status (voltage, etc.). It is also recommended to replace battery periodically.

② Education

- Educate perfusionists as well as medical staff in related departments.
 - Host safety training sessions on a regular basis, including handling briefings and trouble simulations. It is also important to keep a record of the training sessions conducted. In particular, awareness of alarms and how to deal with troubles needs to be communicated.
- Prepare manuals which are easy to understand and safety management checklists for handling and troubleshooting:
 - Prepare a quick reference manual and attach to the device.
 - During implementation, it is also effective to periodically conduct in-use inspections using a checklist to prevent device troubles.
 - Manuals and checklists should be shared with the medical team and used as information exchange tools.

③ During ECMO implementation

- Check the AC power supply drive:
 - Check that the power supply lamp is lit (Fig. 1).
 - In addition to the daily inspection of ECMO, alarm settings, outlet connections, etc. should be checked and recorded on the check sheet.
- Alert to avoid accidental unplugging of the power supply.
 - Attaching a caution tape to the power outlet is effective (Fig. 2).
 - Make sure that the power supply is firmly plugged in on the device as well (Fig. 3).



Fig. 1



Fig. 2
(Red caution tape indicating
"DO NOT UNPLUG")



Fig. 3

④ In case of abnormal shutdown

- Identify the cause:
 - The AC power supply may have stopped (power failure, power outlet disconnection, wire breakage, etc.) or the device itself may have failed. Check the alarm display or AC power connection to determine the cause.
 - It is effective to make decisions using a checklist, as there can be simple causes such as disconnection of the power outlet.
- Carry out an emergency backup:
 - Hand crank (Fig. 4) which is attached to the ECMO device should be kept nearby. If ECMO shuts down abnormally and cannot be restored, the circulation should be immediately maintained with a hand crank and its effectiveness should be confirmed with a patient monitor. (Training is recommended.)

Fig. 4

