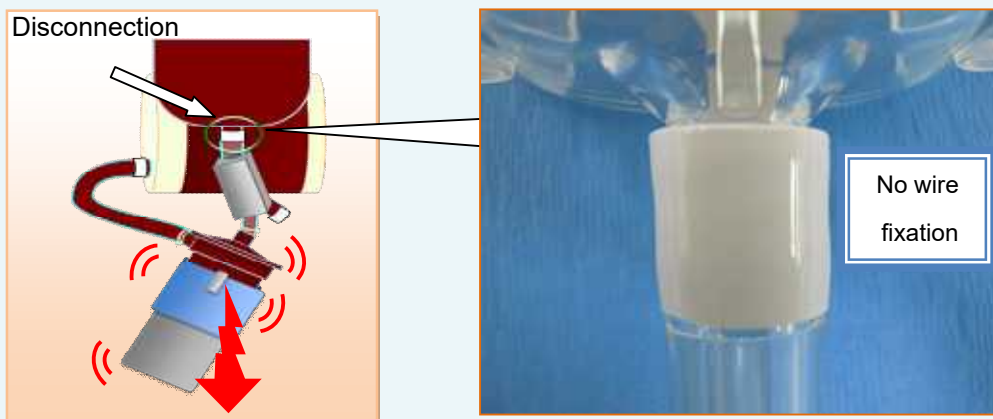


# Safety check of cardiopulmonary bypass circuit connections

## 【Case】

"During extracorporeal circulation with a pre-connected circuit, the tubing connection just below the reservoir outlet became disconnected"

- The vibration of the external motor of the centrifugal pump was transmitted to the tubing directly under the reservoir outlet (without wire fixation), loosening the connection, and the weight of the tubing further caused excessive tension on the circuit.
- In relation to this, there has been report of blood leakage during extracorporeal circulation from the connection of arterial filter, even though the connections were secured with wire.



## 【Points to note】

- Prior to initiation and during extracorporeal circulation, safety checks of the circuit connections should be performed in the same manner as for conventional circuits.  
(Don't feel safe just because it is a pre-connected circuit.)
- Disconnection can be caused by variety of factors in areas of high or low pressure in the circuit.  
Examples: pulling, insufficient fixation, loosening of connections due to transmission of arterial pump vibrations.

## Countermeasures

### ① Safety check of circuit connections

- Check the tensile strength manually after assembling the circuit.
- During priming, apply a pressure load equal to or greater than the predicted perfusion pressure to check for leaks.
- There have been reports of cases where loosening was detected due to gas leakage from the arterial filter during CO<sub>2</sub> flush prior to priming.

### ② When designing a circuit, confirm the method of fixing circuit connections with the manufacturer in advance, and consider the necessary fixing method for each facility.

③ The circuit configuration should be such that excessive tension is not applied.

Consider the position and layout of the oxygenator (reservoir) in relation to the centrifugal pump's external motor and arterial pump.

④ Consider facility-specific standards for connection reinforcement.

Example: reinforce connection with cable ties

⑤ Make effective use of safety devices.

Safety devices do not guarantee absolute safety, but can help prevent the spread of damage.

Conduct simulation training.

Prepare an emergency set and conduct simulation training on a daily basis as a countermeasure in case of circuit disconnection.