Project to Collect Medical Near-Miss/Adverse Event Information

Medical Safety Information

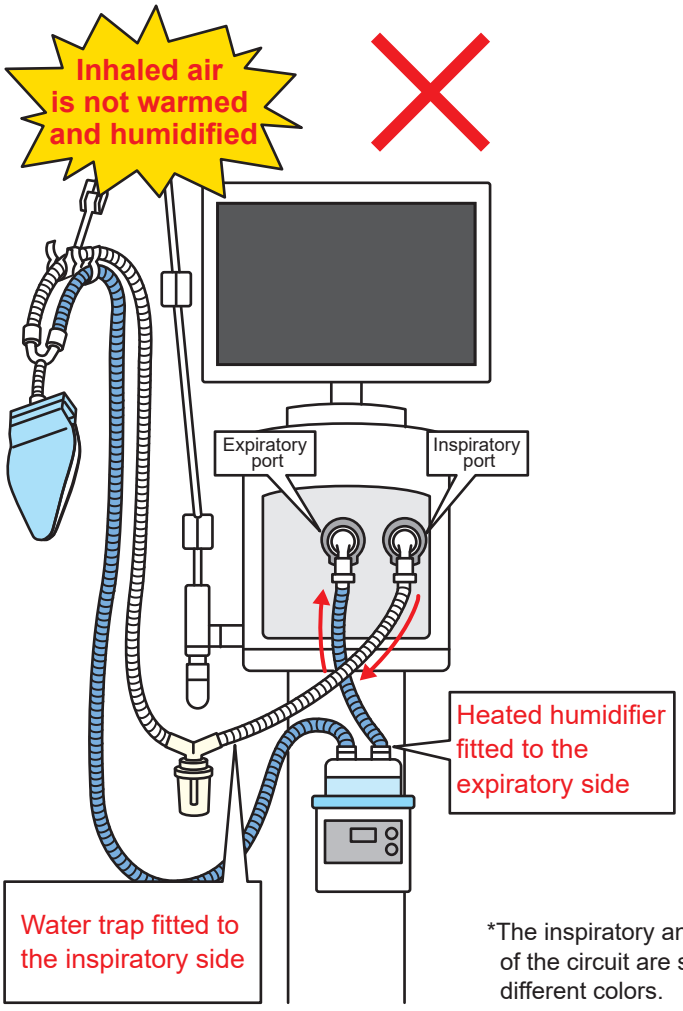
November 2023 No.204

Misconnection of Inspiratory and Expiratory Sides of a Ventilator Circuit

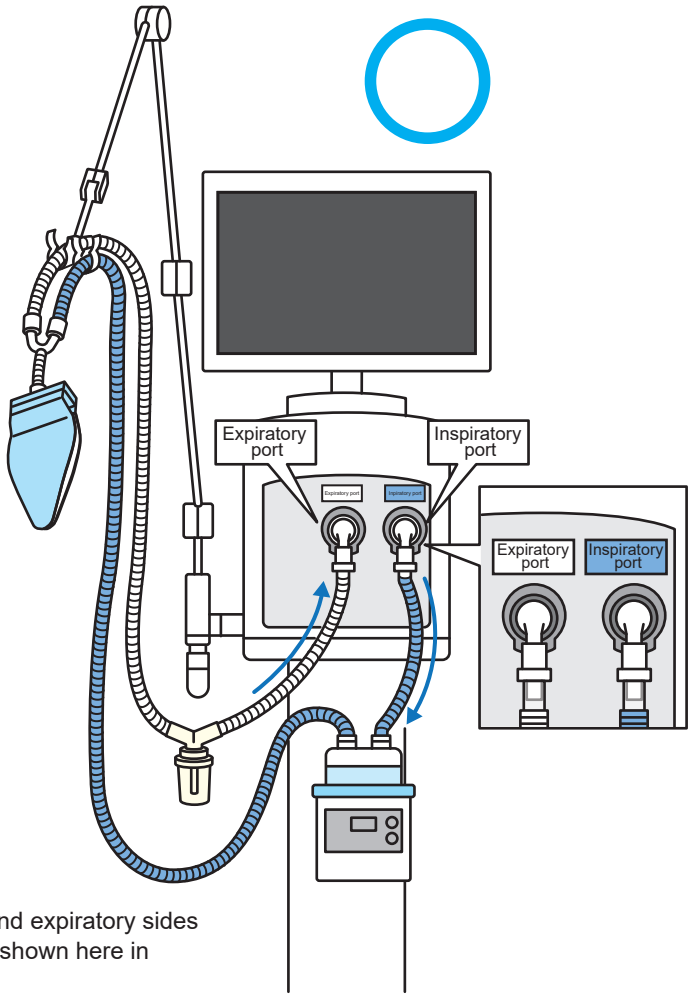
Cases have been reported in which the inspiratory and expiratory sides of a ventilator circuit were connected the wrong way around.

Eight such cases were reported between January 1, 2019 and September 30, 2023. This information was compiled on the basis of the content featured in the Recurrence of Events and Occurrence of Similar Events section of the 72nd Quarterly Report.

Image of case 1



Correct connection



*The inspiratory and expiratory sides of the circuit are shown here in different colors.

◆ Medical Safety Information No.24 “Tubing misconnection of ventilator circuit” focused on the general category of cases in which ventilator circuit tubing was misconnected.
This time, we have narrowed down the focus to the subcategory of cases in which the inspiratory and expiratory sides of a ventilator circuit were connected the wrong way around.

Misconnection of Inspiratory and Expiratory Sides of a Ventilator Circuit

Case 1

In NICU, the clinical engineer assembled the ventilator circuit and the nurse prepared the ventilator at the patient's bedside. After the pediatric patient, who had been born by cesarean section, was brought to the room, the physician commenced ventilator management. The following day, inhaled nitric oxide was administered, but fractional exhaled nitric oxide did not rise and no improvement in oxygenation was observed. The clinical engineer checked the ventilator and noticed that the inspiratory and expiratory sides of the circuit had been connected the wrong way around.

Case 2

The pediatric patient was being managed on a ventilator. The alarm signaling a fall in the temperature of the ventilator's heated humidifier sounded, so the nurse checked and found that the temperature at the patient's mouth was showing as 34°C. The physician and the nurse tried changing the temperature sensor, but the temperature did not rise. The clinical engineer checked and found that the inspiratory and expiratory sides of the circuit had been connected the wrong way around, so the air was not being warmed and humidified.

Preventive measures taken at the medical institutions in which the events occurred

-Attach tape labeled "inspiratory port" and "expiratory port" to the ventilator circuit's connection ports.

-Before connecting the ventilator circuit to the patient, trace the inspiratory and expiratory sides of the circuit back to the ports to check that the circuit has been assembled correctly.

The measures above are examples. Please consider initiatives suitable for your own facility.

* As part of the Project to Collect Medical Near-Miss/Adverse Event Information (a Ministry of Health, Labour and Welfare grant project), this medical safety information was prepared based on the cases collected in the Project as well as on opinions of the "Comprehensive Evaluation Panel" to prevent the occurrence and recurrence of medical adverse events. See the Project website for details.
https://www.med-safe.jp/
* Accuracy of information was ensured at the time of preparation but cannot be guaranteed in the future.
* This information is intended neither to limit the discretion of healthcare providers nor to impose certain obligations or responsibilities on them.

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