Project to Collect Medical Near-Miss/Adverse Event Information

Medical Safety Information

August 2023

No.201

We have introduced a new design for these bulletins

Wrong Unit Selected on Syringe Pump

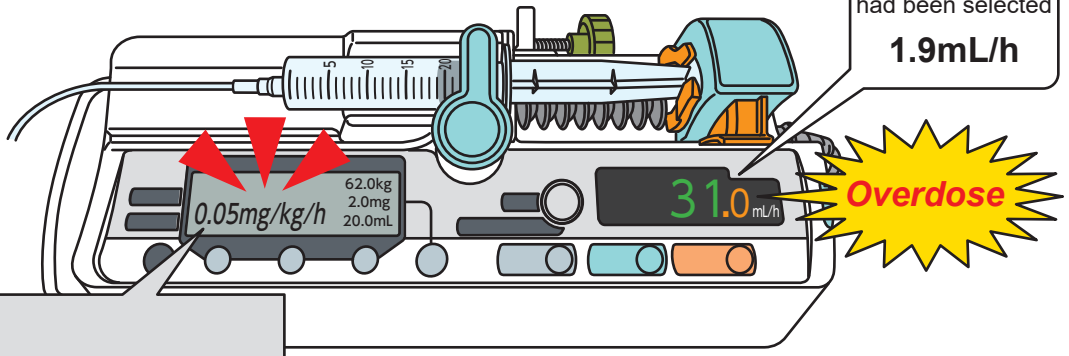
Cases have been reported in which drugs were administered at a different flow rate from that intended, because the wrong unit (e.g. μg/kg/min or mg/kg/h) was selected on the syringe pump.

Eight such cases were reported between January 1, 2017 and June 30, 2023. This information was compiled on the basis of the content featured in the Analysis Themes section of the 72nd Quarterly Report.

Intended Unit	Unit Selected in Error	Active Ingredient in Drug Administered	Number of Cases	Flow Rate Error
μg/kg/min	mg/kg/h	Remifentanil hydrochloride	2	1.67 times
		Dobutamine hydrochloride	1	
		Nicorandil	1	
	mL/h	Remifentanil hydrochloride	1	Underdose
mL/h	μg/mL (TCI mode)	Propofol	2	Overdose
	mg/kg/h		1	3.6 times

Image of case 1

<Intended dosage>
Remifentanil hydrochloride
0.05μg/kg/min



<Incorrect setting used>
0.05mg/kg/h

Weight	62.0kg
Medication quantity	2.0mg
Solution volume	20.0mL

Wrong Unit Selected on Syringe Pump

Case 1

The anesthesiologist intended to start administering remifentanil hydrochloride for an operation at 0.05 μg/kg/min. When setting the unit on the syringe pump, the anesthesiologist selected mg/kg/hr in error and began administering the drug at 0.05 mg/kg/hr. The display on the syringe pump also showed 31 mL/h, but the anesthesiologist did not look at it. As the patient's eyeballs rolled upwards and their SpO2 dropped to the 60% range immediately afterwards, the anesthesiologist realized they had administered a 1,670% overdose.

Case 2

When using propofol to sedate a patient being managed on a ventilator, the physician had ordered the drug to be administered at a rate of 5.5 mL/h, but Day Nurse A assumed the unit was mg/kg/h. After checking that the unit on the syringe pump was mg/kg/h, Day Nurse A entered the digits "5.5". The display on the syringe pump also showed 20 mL/h, but Day Nurse A began administration without noticing the error. An hour and a half later, Night Nurse B visited the patient's room and noticed that the flow rate was incorrect, so they halted administration and reported it to the physician. The drug had been administered at around 360% of the intended flow rate and the patient's blood pressure had fallen.

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

-When setting a syringe pump whose units can be altered, check not only the dosage figures, but also the unit.
-After entering the settings, check the flow rate (mL/h) displayed on the syringe pump before starting it.

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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