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Abstract Title	Cylinder pump is more effective in administration of pediatric dose dopamine compared to syringe pump.
Category	B) Non-Clinical, 22 Others
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Background and Aims

- ◆ Syringe pump is preferred to the peristaltic pump when administering intravenous drug with low flow rate.
 - The premixed drug in the fluid bag must be transferred to the syringe.
 - This process not only increases the work loading of the nursing staff, but also increases infection risk or missed-happed syringe problem.
- ◆ A cylinder pump has been recently developed.
 - Delivers predetermined volume according to the movement of the cylinder
 - It can be versatilely connected with both fluid bag and syringe and, therefore, avoid the problems associated with the process of drug transferring from the bag to syringe (Fig. 1)
 - As yet, its performance in pediatric care has not been investigated.

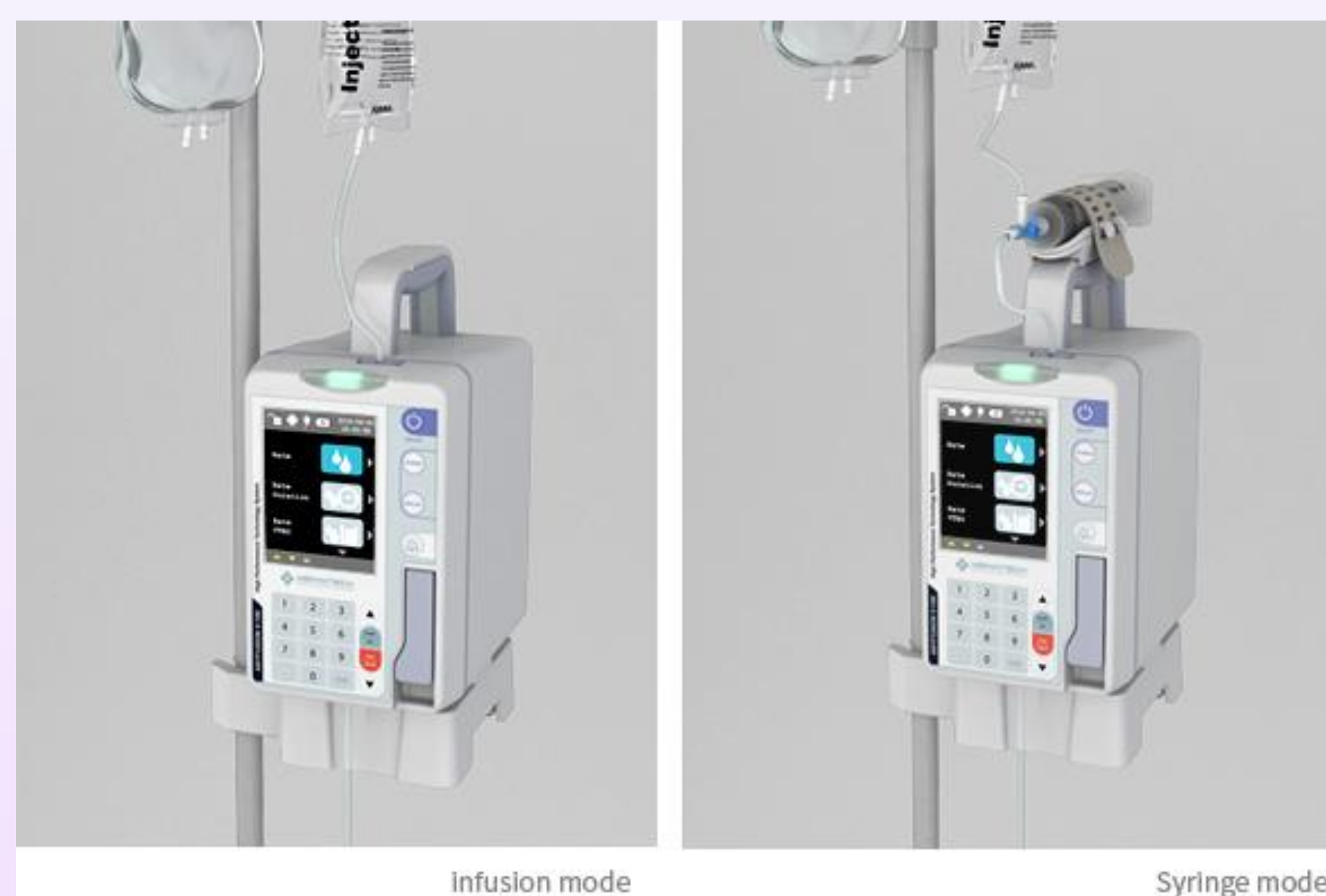


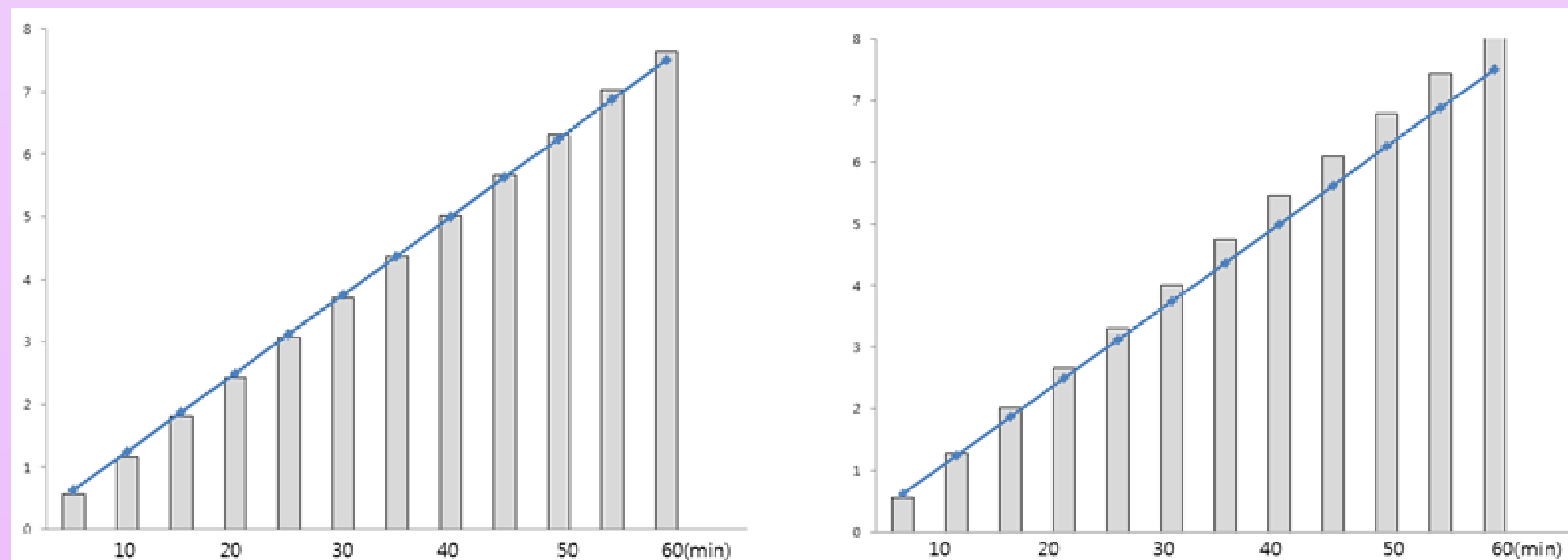
Fig. 1 The two performing modes of a cylinder pump (Anyfusion V-100™, Meintech)

In this study, we investigated the performance of cylinder pump in pediatric dose of dopamine delivery by comparing to conventional syringe pump.

Methods and Results

- ◆ To simulate delivery of the dopamine to a pediatric patient of 10 Kg body weight, flow rate of 7.5 ml/hr was tested with syringe pump (PefusorSpace™, Bbrn) and cylinder pump (Anyfusion V-100™, Meintech).
 - Test was performed with commercially available dopamine premix (800mcg/ml) prepared in 50 ml syringe and the premix-bag for syringe pump, and cylinder pump, respectively.
 - The actual volume of delivered fluid (by min) and start-up delay (by sec) were recorded.
 - The time to deliver the 7.5 ml (completion time, CT) and the actual delivered volume at one hour (1 hr-delivered volume, Vol1h) were also recorded.
 - Mann-Whitney test was used.

Fig. 2 the actual (column) and expected (line) delivered volume (L: cylinder pump, R: syringe pump)



- ◆ Cylinder pump showed shorter start up delay in comparison to syringe pump (9.6 ± 7.0 s vs. 60.4 ± 50.8 s, $P < 0.01$).
- ◆ Cylinder pump showed exact CT (60 min) in 5/7 (71%) experiments, but syringe pump CT < 60 min in all experiments (CT time: 58.9 ± 1.9 min s vs. 55.3 ± 1.4 min. $P < 0.01$).
- ◆ Fig. 2 shows the actual (column) and expected (line) delivered volume of the two pumps. Vol1h was 7.6 ± 0.0 ml in cylinder pump and 8.2 ± 0.2 ml in syringe pump ($P < 0.01$).

Conclusions

The cylinder pump shows accurate drug delivery for pediatric dose of dopamine which was prepared in a fluid bag. In addition, it showed more precise delivery dynamic when compares to the syringe pump. Cylinder pump can be an effective alternative to the syringe pump for pediatric dose of dopamine.