

Physicochemical stability of dexmedetomidine diluted in 5% glucose solution in syringes

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INTRODUCTION

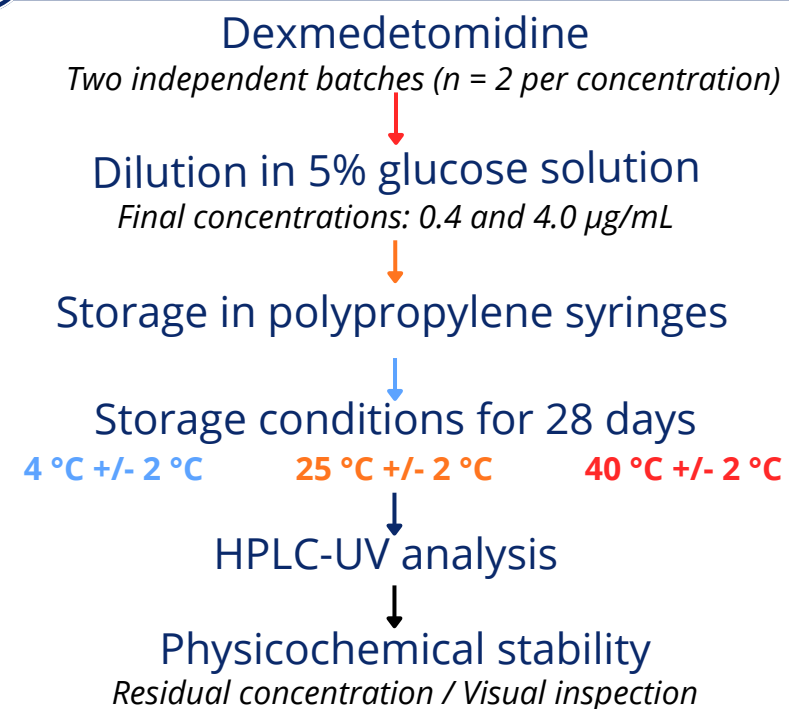
Dexmedetomidine is increasingly used in neonatology. In preterm infants, sodium intake restrictions often lead to the use of **5% glucose solution** (G5%) as a diluent. However, its stability in this diluent has not been documented, particularly at low concentrations.



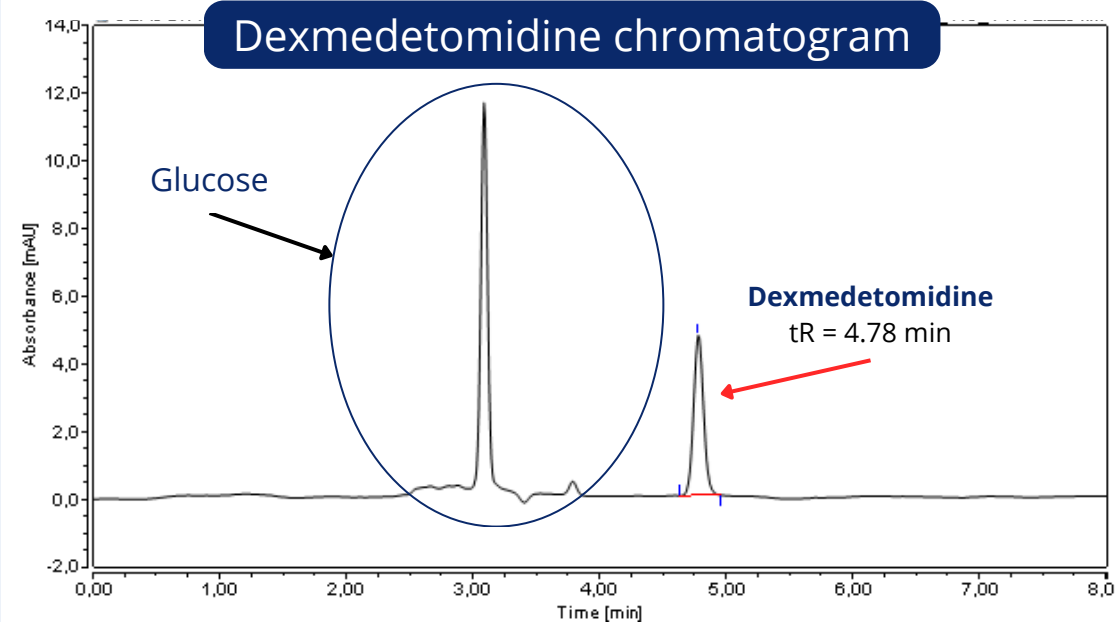
OBJECTIVE

To evaluate the physicochemical stability of dexmedetomidine at 0.4 and 4 µg/mL in G5%, stored in syringes at different temperatures.

MATERIALS AND METHODS



RESULTS



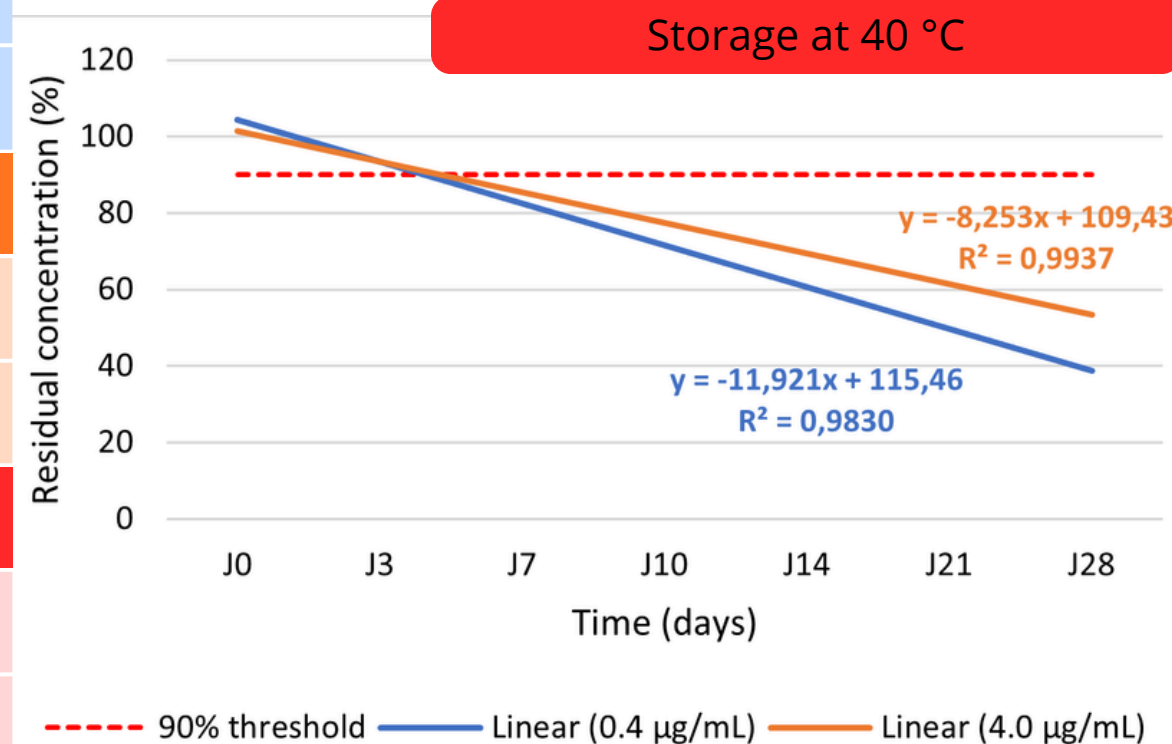
HPLC CONDITIONS

- **Column** : C18-HQ (250 × 4.6 mm; 5 µm)
- **Mobile phase** : acetonitrile/0.02 M phosphate buffer pH 3 (35:65, v/v)
- **Flow rate** : 0.8 mL/min
- **Detection** : UV 220 nm
- **Software** : Chromeleon® 7



Residual concentration at day 28 (% remaining)	4 °C	
	0.4 µg/mL	4.0 µg/mL
	87.7%	98.3%
	25 °C	
	0.4 µg/mL	4.0 µg/mL
	89.9%	98.3%
	40 °C	
	0.4 µg/mL	4.0 µg/mL
	33.5%	53.8%

Stability defined as a residual concentration ≥ 90%



Changes in residual dexmedetomidine concentrations in syringes during storage at 40 °C

KEY FINDINGS



- ✓ Stable for **21 days** (0.4 µg/mL)
 - ✓ Stable for **28 days** (4.0 µg/mL)
- At 4 °C and room temperature



At 40 °C, concentrations decreased from **day 7** at both concentrations.



Linear degradation at 40 °C ($R^2 = 0.983$ and 0.994), with slopes of -11.92 and $-8.30\%/day$ for 0.4 and 4.0 µg/mL, respectively.

CONCLUSION

This study provides the **first stability data** for dexmedetomidine diluted in G5% and supports the feasibility of advance preparation in hospital pharmacy practice, provided that appropriate storage conditions are maintained.

PERSPECTIVES

Stability studies are currently being extended to **5% glucose infusion bags** to complement these results.

