Letter to the Editor

Unravelling the DNA of vasoactive agents in Intensive Care Unit: An easier way to prepare vasoactive medications

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Vasoactive agents are drugs frequently used in shock or hypertensive crisis in the intensive care unit (ICU). These medications can lead to major adverse effects if not prepared properly and timely. (Adapa et al., 2012; Russell et al., 2021) Their preparation and administration as an infusion poses tough confusion to inexperienced intensive care staff. The preparation and administration of vasoactive drugs has wide variability in clinical practice globally. (Hunter et al., 2020) These drugs are used in different strengths (single, double, quadruple, and dose mentioned as weight-based (microgram/kg/min) and non-weight based (microgram/min) respectively. (Kattan et al., 2024; Selby et al., 2023) The dose of the norepinephrine (base) needs to be communicated as it is to be added in various scoring systems like sequential organ failure assessment (SOFA), rather than the salt formulation (bitartrate vs hydrochloride). (Kattan et al., 2024; Kotani et al., 2023; Selby et al., 2023).

In this letter, we want to demonstrate an easier way of preparation of such infusions, especially for the more commonly used vasoactive medications. By far to our knowledge, there exists no such article explaining the preparation of vasoactive medications in adult and pediatric ICUs with ease. This would help ICU staff calculate the dose, thereby monitoring for various adverse effects of vasoactive medications. (Mohanna et al., 2022) As they form the crucial organ supports in ICU, we gave the mnemonic to remember as **DNA**:

D-**D**opamine/**D**obutamine
N: **N**itro-glycerine/**N**itroprusside
A: Adrenaline/nor-**A**drenaline

As norepinephrine is the drug which is most commonly used in shock states in different concentrations, for easier understanding of preparation methods, it is further elaborated as 5 times the baseline concentration (5x) with the baseline concentration decided based on predicted bodyweight (Kg) multiplied by 0.03mas shown in Table 1.

Table 1. Vasoactive agents Preparation – Remembered as DNA

Drug	**Availability in mg/ml preparation**	**STEP 1 Calculation of drug dose for preparation**	**STEP 2 How to prepare**	**STEP 3 Infusion rate**	**STEP 4 Actual drug dose patient receiving**
Dopamine/ **D**obutamine	Dopamine Dobutamine	Body weight × 3 =.....mg	To be dissolved in distilled water or 5%Dextrose or 0.9% saline in a 50 ml syringe	1 ml/hr equals to 3 ml/ hr equals to 5 ml/ hr equals to	1 µg/kg/min 3 µg/kg / min 5 µg/kg / min
NTG (nitroglycerine)/ **S**NP (sodium nitroprusside)	NTG SNP	Bodyweight × 0.3 =.....mg	To be dissolved in Distilled water or 5% dextrose or 0.9% saline in a 50 ml syringe	1 ml/hr equals to	0.1 µg/kg / min
Adrenaline Adr)/ Nor**a**drenaline (NA)	NA Ad	Body weight × 0.03 = ...mg ➔ Single strength (Rescue: z mg) ➔ 5 strength:5z mg	To be dissolved in Distilled water or 5% dextrose or 0.9% saline in a 50 ml syringe To be dissolved in Distilled water or 5% dextrose in a 50 ml syringe	1 ml/ hour equals to 3 ml/hour equals to 10 ml/hour equals to 1 ml/ hour equals to 3 ml/hour equals to 10 ml/hour equals to	0.01 µg/kg/min 0.03 µg/kg/min 0.1 µg/kg/min 0.05 µg/kg/min 0.15 µg/kg/min 0.5 µg /kg/min

Although introducing mathematics in high stress settings can lead to dosing errors, they should be an easier way for the preparation of these drugs, which if given in wrong doses can lead to life threating adverse effects and incorrect literature as these doses are taken in the databases of various studies. Although stated the ease of preparation of vasoactive drugs through this mnemonic needs to be assessed through an observational study.

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