PBM

PatientBloodManagement

Stop blood loss

Less is more

NEW!
40%
less blood

SARSTEDT

Patient Blood Management – Issues & Solutions!

Patient Blood Management (PBM) is a multi-faceted and interdisciplinary treatment concept for improving patient care. The aim is to handle the patient's blood with the greatest possible care, so that the patient's exposure to allogeneic blood or allogeneic blood products in the event of anaemia is kept as low as possible. In this way, the development of hospital-acquired anaemia should be reduced to a minimum or completely prevented.[1,2,3]

The PBM concept is based on three key elements:

1. Diagnosis and therapy of pre-operative anaemia
2. Reduction of laboratory diagnostic and interventional blood loss
3. Controlled use of erythrocyte concentration and full utilisation of individual anaemia tolerance.

Laboratory diagnostic blood loss and clinical relevance

Hospital-acquired anaemia has a negative effect on the healing process.

Blood loss is especially high in cardio-surgical patients, patients with coagulation disorders, and in cases of long-term ventilation, e.g. due to the high frequency of blood collections from these patients. Children, the elderly, and patients with a low body weight are particularly affected.

The clinical relevance of diagnostic b lood loss is still often underestimated. Related research shows that:

- Critically ill patients lose an average of 40-70 ml of blood a day[6,7] and an average of 300-500 ml[4,5] during a seven-day hospital stay
- > 50% of all intensive care patients are transfused with allogeneic blood products[8,9,10]
- Diagnostic blood loss correlates with the frequency and severity of hospital-acquired anaemia[4,11]

How can laboratory diagnostic blood loss be reduced?

Laboratory diagnostic blood loss[3,5] can be reduced by decreasing the sample volume of a blood collection tube to a minimum. Today, smallest amounts in the µl range are required to measure laboratory parameters.

S-Monovette® PBM - Specially designed for reduced sample volumes

With the newly designed and innovative S-Monovette® 1.8 ml, Sarstedt offers a blood collection tube with more than 40% less blood volume than traditional tubes. In spite of the reduced volume, the outer tube dimensions conform to the standard dimensions size so that this S-Monovette® can be easily adapted to a range of analysers.

1. *Journal Klinikarzt Medizin im Krankenhaus 44. Jahrgang 3/2015: Patient Blood Management, Georg Thieme Verlag*
2. *KVH aktuell Jahrg. 20, Nr. 3 | September 2015: Kapitel ANÄMIE-SPECIAL Prof. Dr. med. P. Meybohm Transfusionsmedizin: Richtig handeln bei präoperativer Anämie I-XII*
3. *Patient Blood Management Braun-Scharm und Kollegen, Kapitel 4 Gombotz, Thieme Verlag 1. Auflage 2013*
4. *Salisbury, et al. Diagnostic blood loss from phlebotomy and hospital-acquired anemia during acute myocardial infarction. Arch Intern Med. Vol 171 (no. 18), Oct 10, 2011.*
5. *Steiner et al Anämie auf einer Intensivstation. Blutentnahmen und Hämoglobinverlauf. Gemeinsame Jahrestagung der Schweizerischen Gesellschaften für Kardiologie, für Pneumologie, für Thoraxchirurgie, und Intensivmedizin Juni 2006*
6. *Corwin, et al. The CRIT study: anemia and blood transfusion in the critically ill: current clinical practice in the United States. Crit Care Med 32:39-52, 2004.*
7. *Vincent et al. Anemia and blood transfusion in critically ill patients. JAMA 2002, 288: 1499-1507.*
8. *Becquet, et al. Respective effects of phlebotomy losses and erythropoietin treatment on the need for blood transfusion in very premature infants. BMC Pediatrics 13:176-182, 2013.*
9. *Corwin, et al. RBC transfusion in the ICU: is there a reason? Chest 108:767-771, 1995.*
10. *Rao, et al. Blood component use in critically ill patients. Anesthesia 57;530-551, 2002.*
11. *Becquet, et al. Respective effects of phlebotomy losses and erythropoietin treatment on the need for blood transfusion in very premature infants. BMC Pediatrics 13:176-182, 2013.*

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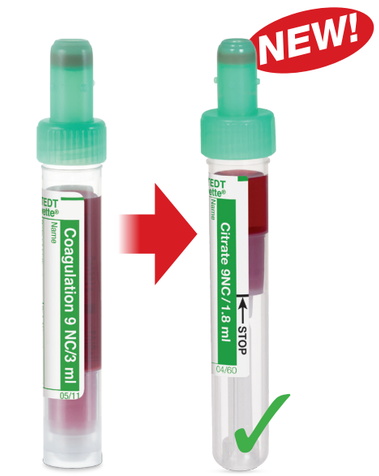
S-Monovette® with reduced volume - advantages for the patient

- **Significantly reduced laboratory diagnostic blood loss**
- **Reduced hospital-acquired anaemia**
- **Improved patient outcome**

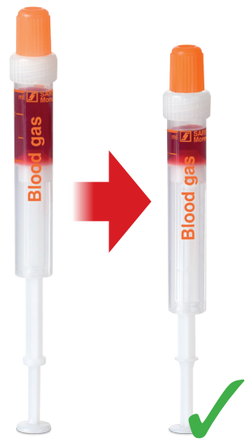
Citrate / Citrate PBM

Standard	Reduced
3.0 ml	1.8 ml



Blood gas

Standard	Reduced
2.0 ml	1.0 ml



Serum-Gel

Standard	Reduced
7.5 ml	4.0 ml

EDTA

Standard	Reduced
2.7 ml	1.6 ml

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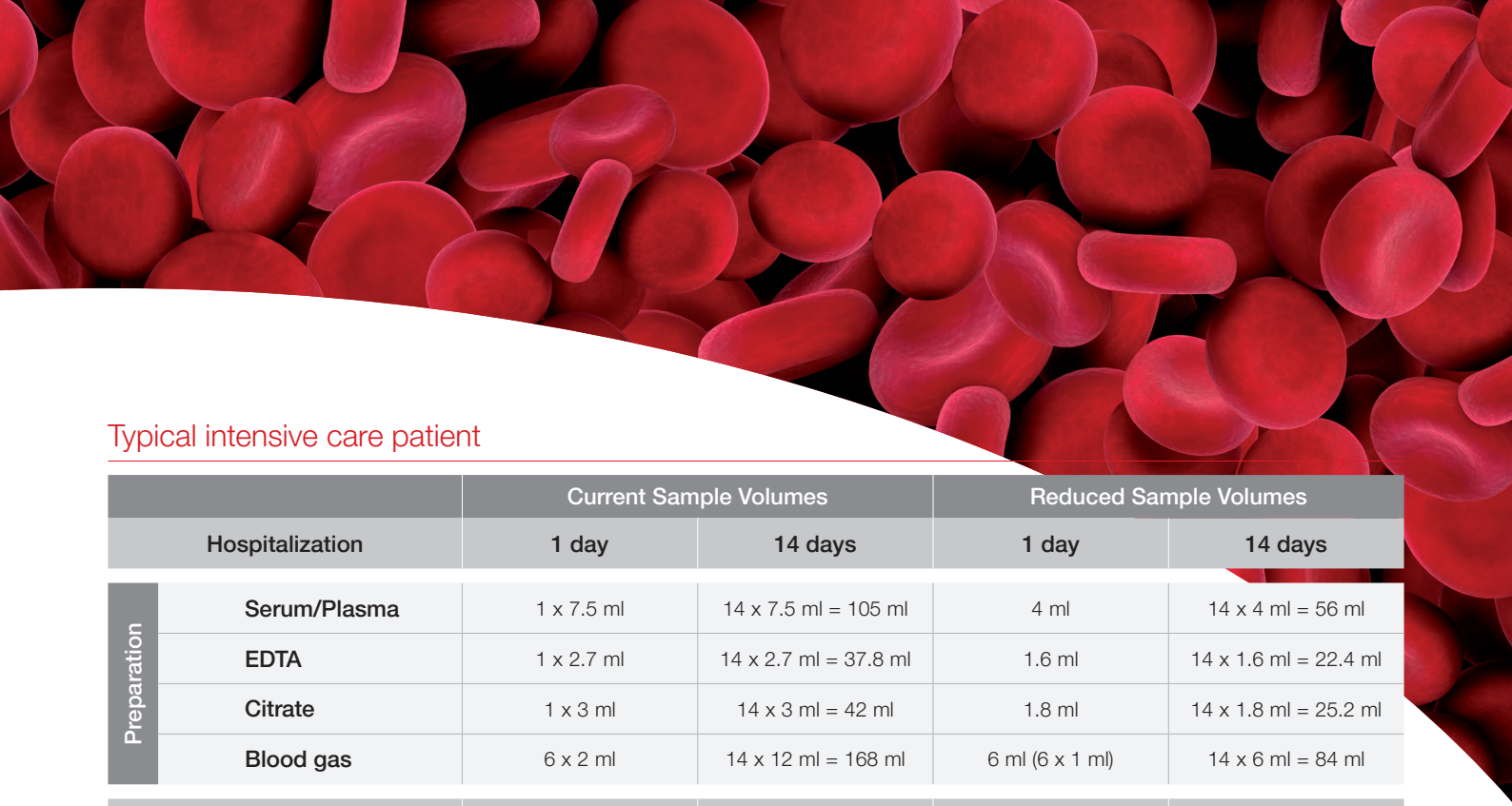

Typical intensive care patient

		Current Sample Volumes		Reduced Sample Volumes	
Hospitalization		1 day	14 days	1 day	14 days
Preparation	Serum/Plasma	1 x 7.5 ml	14 x 7.5 ml = 105 ml	4 ml	14 x 4 ml = 56 ml
	EDTA	1 x 2.7 ml	14 x 2.7 ml = 37.8 ml	1.6 ml	14 x 1.6 ml = 22.4 ml
	Citrate	1 x 3 ml	14 x 3 ml = 42 ml	1.8 ml	14 x 1.8 ml = 25.2 ml
	Blood gas	6 x 2 ml	14 x 12 ml = 168 ml	6 ml (6 x 1 ml)	14 x 6 ml = 84 ml
Total		**25.2 ml**	**352.8 ml**	**13.4 ml**	**187.6 ml**

Example of a typical University Clinic in Germany

Number samples/year	Preparation	Typical sample volume	Reduced sample volume	Saved blood volume/tube	Saved blood volume/year	Saved blood in %
380,000	**Serum**	7.5 ml	4.0 ml	3.5 ml	1,330,000 ml	**47 %**
400,000	**EDTA**	2.7 ml	1.6 ml	1.1 ml	440,000 ml	**41 %**
250,000	**Citrate**	3.0 ml	1.8 ml	1.2 ml	300,000 ml	**40 %**
360,000	**Blood Gas**	2.0 ml	1.0 ml	1.0 ml	360,000 ml	**50 %**
Total		**5,400,000 ml**	**2,970,000 ml**	**6.8 ml**	**2,430,000 ml**	**Ø = 45 %**
					= 2,430 liters	

In one year, about 2,430 L blood can be saved and patients' lives can be protected.

Ordering information

Preparation	Volume	Length / Ø	Order No. EU Colour code	Order No. US Colour code
Citrate 9NC 3.2%	1.8 ml	75 x 13 mm	04.1955.001	04.1955.100
EDTA K_3E	1.6 ml	66 x 11 mm	05.1081.001	05.1081.100
Serum-Gel	4.0 ml	75 x 13 mm	04.1925/04.1925.001	
Blood Gas	1.0 ml	66 x 11 mm	05.1146/05.1146.020*	

* ind. wrapped, sterile

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