

PBM

PatientBloodManagement



40%
less blood!



SARSTEDT

Patient Blood Management – what's it all about?

Patient Blood Management (PBM) is a multi-modal 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. This should reduce the development of hospital-acquired anaemia to a minimum or completely prevent it.^{1,2,3}

The 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. Rational use of erythrocyte concentration and utilisation of individual anaemia tolerance

Laboratory diagnostic blood loss and clinical relevance

Hospital-associated anaemia has an adverse effect on disease progression. Blood loss is especially high in cardio-surgical patients, patients with coagulation disorders, and in cases of long-term ventilation and multiple procedures due to the high frequency of blood collections.

Children, the elderly and patients with a low body weight are particularly affected.

The clinical relevance of diagnostic blood loss, shown in figures, is as follows:

– this has often been underestimated up to now –

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

How can laboratory diagnostic blood loss be reduced?

Laboratory diagnostic blood loss^{3,7} can be reduced by decreasing the sample volume of a blood collection tube. Today, only the smallest amount in the µl range is required to measure laboratory parameters.

S-Monovette® PBM – specially developed for reduced sample volumes

With the innovative and newly developed S-Monovette® 1.8 ml, Sarstedt offers a blood collection tube with a blood volume more than 40% lower than traditional tubes. In addition to the reduced sample volume, the S-Monovette® can be easily adapted to a range of analysers due to the tube's standardised outer dimensions.

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. 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.
5. Vincent et al. Anemia and blood transfusion in critically ill patients. JAMA 2002, 288: 1499-1507.
6. 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.
7. 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
8. Corwin, et al. RBC transfusion in the ICU: is there a reason? Chest 108:767-771, 1995.
9. Rao, et al. Blood component use in critically ill patients. Anesthesia 57:530-551, 2002.
10. 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.

S-Monovette® with reduced sample volume – benefits for the patient

- Significantly reduced laboratory diagnostic blood loss
- Reduced rate of hospital-acquired anaemia
- Better patient outcome

Citrate Citrate PBM

Standard Reduced



3.0 ml

1.8 ml

Blood gas

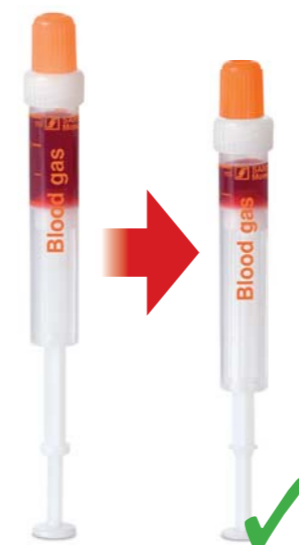
Serum Gel

EDTA

Standard Reduced

Standard Reduced

Standard Reduced



2.0 ml

1.0 ml



7.5 ml

4.0 ml



2.7 ml

1.6 ml

Typical intensive care patient

Hospitalisation		Current sample volume		Reduced sample volume	
		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 of samples/year	Preparation	Typical sample volume	Reduced sample volume	Saved blood volume/tube	Saved blood volume/year	Saved blood volume 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 = 2,430 litres	Ø = 45 %

In one year, 2,430 litres of blood could be saved, protecting patient's lives.

Ordering information

Preparation	Volume	Length/Ø	Order number based on BS 4851 (EU Code)	Order number based on ISO 6710 (US Code)
Serum Gel	2.7 ml	75 x 13 mm	04.1923.001	
	4.0 ml		04.1925/04.1925.001	
Serum	2.7 ml	75 x 13 mm	04.1943.001	04.1943.100
	4 ml		04.1924	04.1924.100
EDTA	1.6 ml	66 x 11 mm	05.1081/05.1081.001	05.1081.100
	1.8 ml	65 x 13 mm	04.1951/04.1951.001	04.1951.100
Citrate	1.8 ml	75 x 13 mm	04.1955/04.1955.001	04.1955.100
Blood gas	1.0 ml	66 x 11 mm	05.1146/05.1146.020*	

*individually wrapped, sterile

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