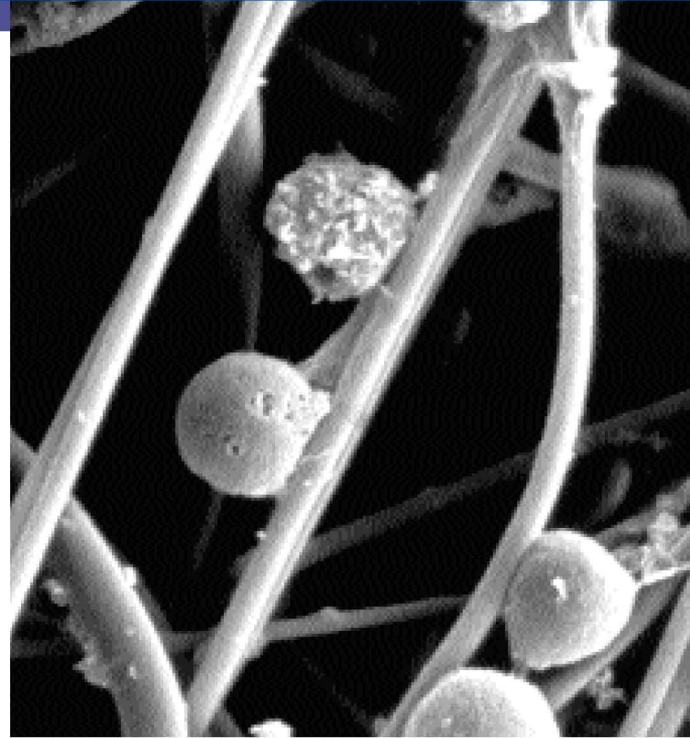




Medical

clinical update



Systemic Leukocyte
Reduction

Filtration. Separation. Solution.SM

Summary

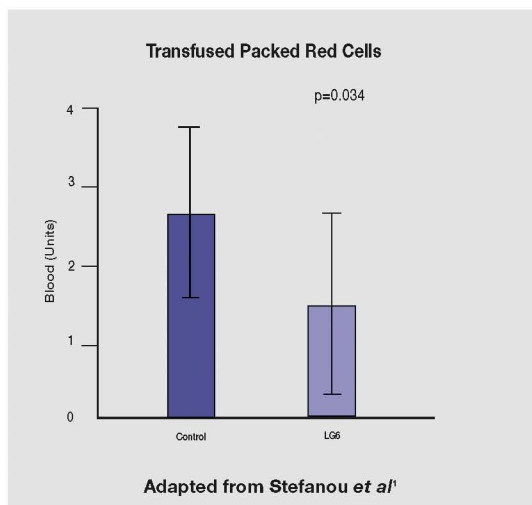
The prophylactic use of the **Pall** LeukoGuard™ LG Leukocyte Reduction Arterial Blood Filter reduces the number of activated neutrophils and dampens the whole body inflammatory response in patients undergoing cardiopulmonary bypass (CPB). This translates into improved clinical outcomes:

- Reduction in perioperative blood loss and the need for blood transfusion.¹⁻³
- Improved pulmonary protection^{4-9,11}
- Improved myocardial protection^{2,6,10}
- Improved neurological protection^{2,17}
- Reductions in length of hospital stay and costs.^{1,4,5,13}

Reduction in Blood Transfusions/ Blood Loss

Significant reductions in blood loss and the requirement for allogeneic blood transfusions in routine elective CABG patients have been demonstrated.¹⁻³

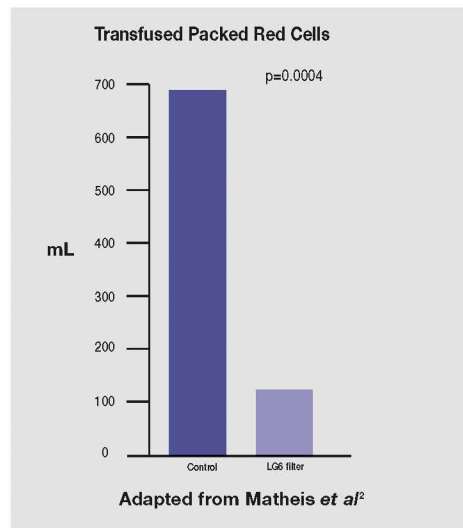
A study at the Hammersmith Hospital, London UK reported a reduction in blood transfusion requirement of 1.2 units in routine elective CABG patients when **Pall** LeukoGuard™ LG filters were used.



The authors commented that:

"In an era of increasing awareness of costs, the saving of one unit of blood per patient, as demonstrated in our study, equals to the amount of £85. This amount neutralises the cost of application of leukocyte-depleting technology instead of the conventionally used filters"

Similar reductions in red cell transfusion requirements were noted by Matheis et al.²



The **Pall** LeukoGuard™ LG can be used in conjunction with other anti-inflammatory techniques to reduce drainage loss and transfusion requirement.³

Drainage Loss		
Heparin coated circuit + LG6	Noncoated, standard filter	p
526 +/- 333mL	786 +/- 514mL	<0.05

Red Cell Transfusions		
Heparin coated circuit + LG6	Noncoated, standard filter	p
92 +/- 224mL	349 +/- 606mL	<0.05

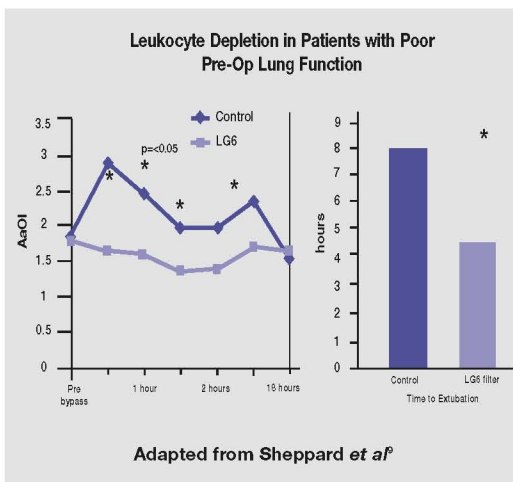
Adapted from Martens et al³

This improvement in post-operative bleeding and reduction in red cell transfusions may partially be explained by the preservation of platelet reactivity that has been noted by Shagalian and co-workers.¹²

Pulmonary Protection

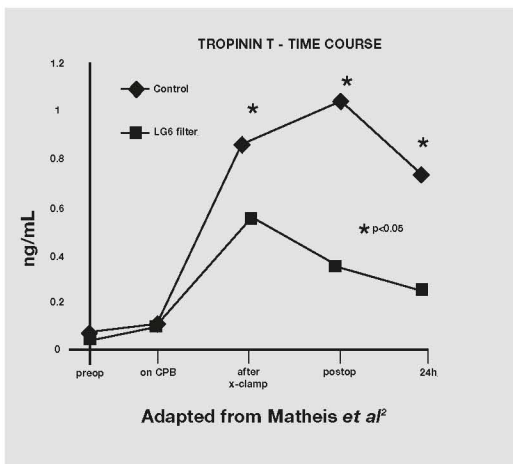
Improvements in arterial oxygenation indexes have been noted in numerous papers.^{4-9,11} Significant improvements in lung function being most apparent in patients with longer bypass times, poor pre-operative lung function or complex surgery.^{8,9}

These improvements in pulmonary function result in shorter periods of mechanical support and reduced length of ICU stay.^{4,5}



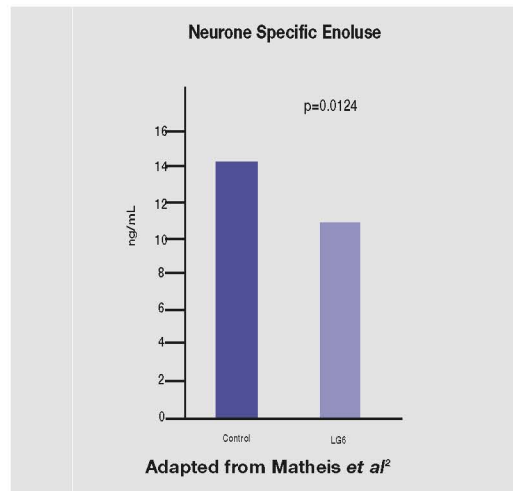
Myocardial Protection

Reductions in the release of CPK-MB and Troponin (T and I) have been recorded when the **Pall** LeukoGuard™ LG arterial line filter has been used.^{2,6,10}



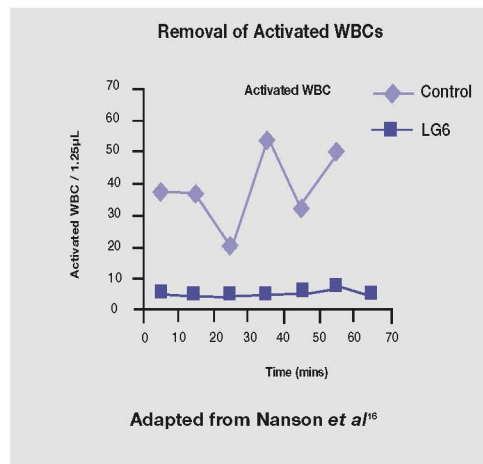
Cerebral Protection

By reducing cerebral microemboli and the inflammatory response to CPB the **Pall** LeukoGuard™ LG may further improve cerebral protection levels when compared to standard arterial line filters.^{2,17}



Activated Neutrophil Reduction

The **Pall** LeukoGuard™ LG filter has specialised media designed to remove potentially harmful leukocytes and emboli from the bypass circuit.¹⁴⁻¹⁶ Nanson and co-workers have demonstrated that the leukocyte filter media effectively removes activated neutrophils during the period of CPB bypass.¹⁶



Reductions in Length of Stay and Costs

Improved patient outcome has been demonstrated with the use of the **Pall** LeukoGuard™ LG arterial line filter that may contribute to reductions in length of stay and associated hospital costs.^{4,5,13}

When compared to other anti-inflammatory strategies, leukocyte reduction has been demonstrated to be superior for the majority of cardiac patients.¹³

Predicted Mortality Strata	Standard Treatment. Roller Pump, Mem-Ox Steroids		Standard plus Aprotinin		Leukocyte Depletion Filters		Centrifugal Pumps Heparin bonded circuits	
	LOS (days)	Cost (\$U.S)	LOS (days)	Cost (\$U.S)	LOS (days)	Cost (\$U.S)	LOS (days)	Cost (\$U.S)
Low Risk Elective Patients (<5% mortality)	6.8	39,000	6.0	35,000	5.4	33,000	6.7	36,000

LOS = Length of stay

Adapted from Gott et al¹³

Summary

By selectively removing activated neutrophils during CPB, the **Pall** LeukoGuard™ LG Leukocyte Reducing Arterial Line Blood Filter reduces the whole body inflammatory response. This leads to a reduced requirement for blood transfusions, improved pulmonary, myocardium and cerebral protection that may all contribute to a cost-effective approach to improving the clinical outcome of CPB patients.

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