

BMA[®]G2

BONE MARROW ASPIRATE CONCENTRATE

HARVEST[®]
TERUMO



Iliac Crest: The Gold Standard

Iliac crest is often considered the gold standard for harvesting. The iliac crest contains bone marrow which is a rich source of regenerative cells, including:

Endothelial Progenitor Cells :: Stimulate angiogenesis, release BMP-2 and BMP-6, and up-regulate the production of BMP-2¹

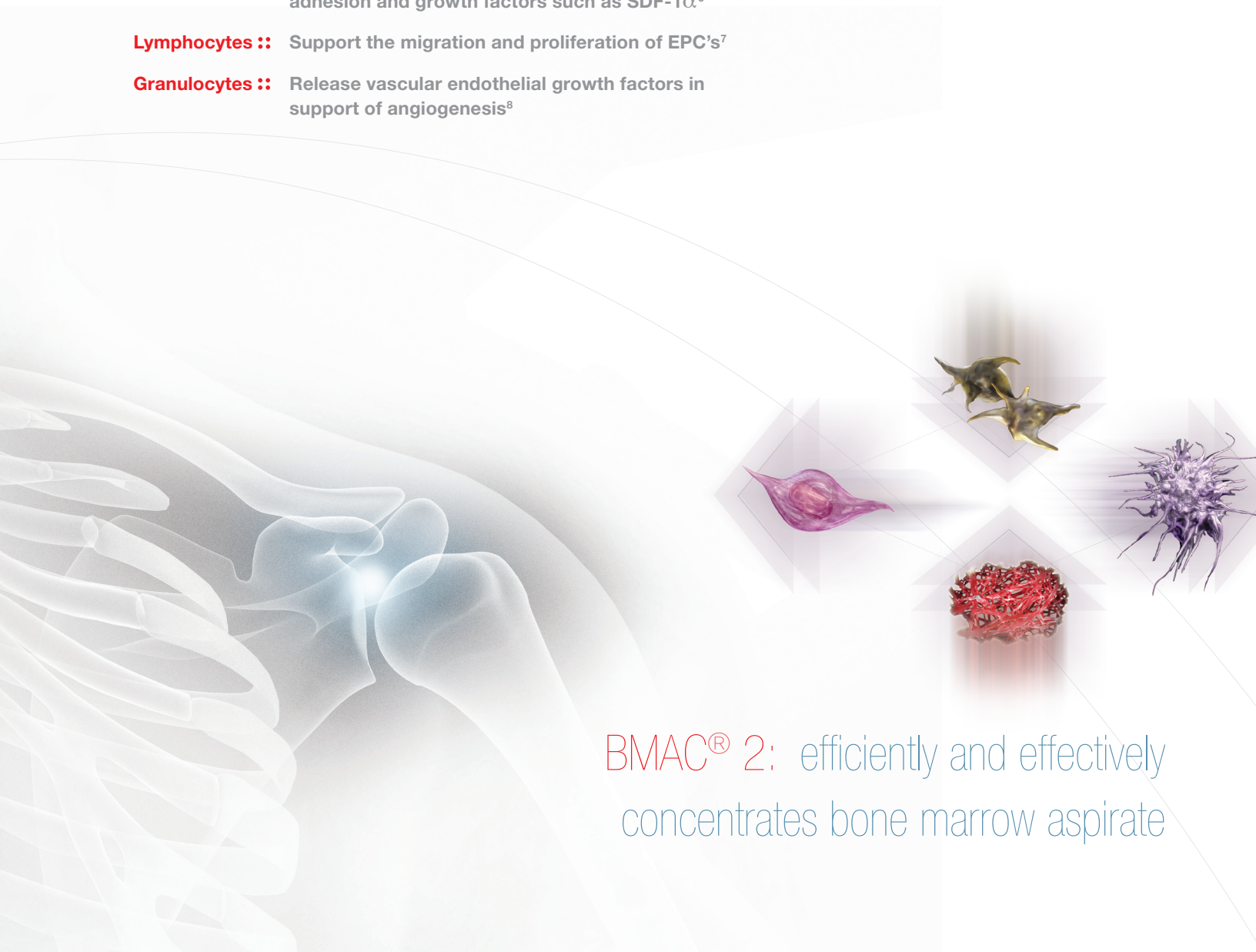
Hematopoietic Stem Cells :: Directly convert to stromal MSC's (CD34⁺)^{2, 3, 4}

Mesenchymal Stem Cells :: Convert to osteoblasts^{2, 3, 4, 5}

Platelets :: Mediate cell-to-cell adhesion through the release of various adhesion and growth factors such as SDF-1 α ⁶

Lymphocytes :: Support the migration and proliferation of EPC's⁷

Granulocytes :: Release vascular endothelial growth factors in support of angiogenesis⁸



BMAC[®] 2: efficiently and effectively
concentrates bone marrow aspirate

Concentrating Bone Marrow Cells

Harvest Technologies is the leader in developing point-of-care platforms to concentrate bone marrow and accessory cells.

A decade ago, we introduced the first SmartPREP® Cell Concentrate System, making the use of autologous bioactive cells practical in hospital and office settings for the first time. Today it is standard-of-care.

Harvest continues its leadership tradition with the introduction of BMAC 2 for concentrating stem cells from bone marrow aspirate.





Concentrating Nucleated Cells

Iliac crest is a rich source of regenerative cells.

The cellular composition of iliac crest bone and concentrated nucleated cells from marrow aspirate are virtually equivalent.

BMAC vs. Iliac Crest			
	Iliac Crest	Bone Marrow Aspirate	Harvest BMAC
Total Nucleated Cells/mL	56×10^6 (n=10) ⁹	19×10^6 (n=10) ^{9, 10}	72×10^6 (n=200) ^{9, 10}

BMAC is a minimally invasive procedure that saves operating room time.

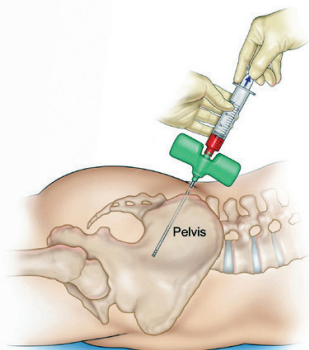
The Harvest BMAC 2 Series used with the SmartPReP 2 technology efficiently concentrates and recovers nucleated cells.

Superior Performance

The BMAC system produces the highest cell yields available while concentrating the full complement of cells.¹¹

The BMAC 2 System:

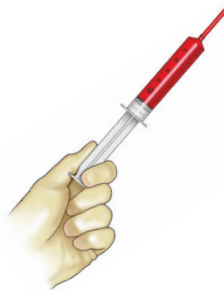
- :: Concentrates all the key cells in their natural ratios
- :: Keeps cells in their natural plasma
- :: Concentrates cells in less than 15 minutes at point-of-care
- :: Produces consistent and reliable nucleated cell loads¹⁰



Aspirate



Concentrate



BMAC

References

- (1) Jung, Y, et al, Hematopoietic Stem Cells Regulate Mesenchymal Stromal Cell Induction into Osteoblasts Thereby Participating in the Formation of the Stem Cell Niche, *Stem Cells*, 2008; 26:2042-2051 (2) Matsumoto, T, et al, Therapeutic Potential of Vasclogenesis and Osteogenesis Promoted by Peripheral Blood CD34-Positive cells for Functional Bone Healing, *American Journal of Pathology*, 2006; 169:1440-1457 (3) Matsumoto, T, et al, Fracture Induced Mobilization and Incorporation of Bone Marrow-Derived Endothelial Progenitor Cells for Bone Healing, *Journal of Cellular Physiology*, 2008; 215:234-242 (4) Mifune, Y, et al, Local delivery of Granulocyte Colony Stimulating Mobilized CD34-Positive Progenitor Cells Using Bioscaffold for Modality of Unhealing Bone Fracture, *Stem Cells*, 2008; 26:1395-1405 (5) Tondreau, T, et al, Mesenchymal Stem Cells Derived from CD133-Positive Cells in Mobilized Peripheral Blood and Cord Blood: Proliferation, Oct4 Expression, and Plasticity, *Stem Cells*, 2005; 23:1105-1112 (6) Massberg, S, et al, Platelets Secrete Stromal Cell-Derived Factor 1 α and Recruit Bone Marrow-Derived Progenitor Cells to Arterial Thrombi In Vivo, *Journal of Experimental Medicine*, 2006; 5:1221-1233 (7) Hur, J, et al, Identification of a Novel Role of T Cells in Postnatal Vasclogenesis: Characterization of Endothelial Progenitor Cell Colonies, *Circulation*, 2007; 116:1671-1682 (8) Kusmanto, Y, et al, Platelets and Granulocytes, in Particular the Neutrophils, Form Important Compartments for Circulating Vascular Endothelial Growth Factor, *Angiogenesis*, 2004; 6:283-287 (9) Muschler G, et al, Comparison of bone marrow aspiration and bone core biopsy as methods for harvest and assay of human connective tissue progenitor. Scientific paper 41; presented at 58th Association of Bone and Joint Surgeons Meeting, 2006. (10) Data on file. (11) Hermann, P, et al, Concentration of Bone Marrow Total Nucleated Cells by a Point-of-Care Device Provides a High Yield and Preserves Their Functional Activity, *Cell Transplantation*, 2008; 16:1059-1069



In less than **15 minutes**, 60 mL of
bone marrow aspirate provides
10 mL of concentrated
stem cells.

SmartPReP 2 and BMAC 2: A System You Can Trust

SmartPReP 2

- :: Multifunction, point-of-care platform for concentrating autologous cells
- :: More than a decade of proven reliability
- :: Delivers 100% pure bone marrow aspirate concentrate
- :: One-button operation
- :: 15-minute automated process



BMAC 2 Procedure Packs

- :: All-inclusive procedure packs based on clinical need (*standard 60 mL kit shown above*)
- :: Patented floating shelf technology delivers the multi-potent and progenitor cells needed
- :: Unique 5 port aspiration needle with trocar and blunt tip stylets maximizes cell harvesting in 60 mL and 120 mL kits, and new 15g BMA needle with depth stop in the 30 mL kit can be used to aspirate BMA from sources such as the vertebral body or the iliac crest.

Harvest Products

SMP2-115	SmartPReP 2 Concentrate System 115V-50/60 Hz or 240V-50/60 Hz
WS-2	SmartPReP 2 Workstation
BMAC2 30-01	Bone Marrow Aspirate Concentrate Procedure Pack The BMAC2 30-01 Pack contains bone marrow aspiration and processing components for 30 mL bone marrow aspirate. Makes up to 4 mL BMAC from 30 mL marrow. 1/case.
BMAC2 60-01	Bone Marrow Aspirate Concentrate Procedure Pack Includes bone marrow aspiration and processing components for 60 mL bone marrow aspirate. Makes up to 10 mL BMAC from 60 mL marrow. 1/case.
BMAC2 120-01	Bone Marrow Aspirate Concentrate Procedure Pack Includes bone marrow aspiration and processing components for 120 mL bone marrow aspirate. Makes up to 20 mL BMAC from 120 mL marrow. 1/case.
BMAC2 180-01	Bone Marrow Aspirate Concentrate Procedure Pack Includes bone marrow aspiration and processing components for 180 mL bone marrow aspirate. Makes up to 30 mL BMAC from 180 mL marrow. 1/case.
BAN-10	Bone Marrow Aspiration Needle Kit 11 gauge x 110mm bone marrow aspiration needle with color coded fenestrated needle and blunt tip stylets. 10/case.

SmartPrep BMAC 2 Centrifuge System is intended to be used in the clinical laboratory or intraoperatively at point of care for the safe and rapid preparation of platelet poor plasma and platelet concentrate from a small sample of blood and for preparation of cell concentrate from bone marrow.

Warning: The safety and effectiveness of BMAC for in vivo indications has not been established.

**To arrange an evaluation or for more information,
call 877.8.HARVEST (toll free) or visit us at www.harvesttech.com**



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