

**Conclusion:** Echocardiography is underutilised in acute PE in some regional hospitals in Australia. Elevated troponin levels are associated with increased short term morbidity in acute PE. There is a high proportion of accompanying DVT with acute PE.

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**Assessment of Optimal Cell Therapy for the Angiogenesis Response in a Murine Hindlimb Ischaemia Model using CD34<sup>+</sup> cells and Endothelial Progenitor Cells**

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**Purpose:** Therapeutic angiogenesis using stem/progenitor cells has been the focus of recent research. CD34<sup>+</sup> cells and endothelial progenitor cells (EPCs) have been found to promote angiogenesis. This study aimed to assess the angiogenic potential of CD34<sup>+</sup> cells and EPCs using different modes of delivery *in vivo*.

**Methods:** Human EPCs were isolated from cell cultures and CD34<sup>+</sup> cells were purified from buffy coat using microbeads. Unilateral hindlimb ischaemia was introduced on BalbC nu/nu mice. At 24 hours post-surgery  $2 \times 10^5$  CD34<sup>+</sup> cells, EPCs, or PBS control were injected intravascularly (IV) to the tail vein, or intramuscularly (IM) into adductor muscle. Laser Doppler perfusion imaging (LDPI) was used to assess flow recovery. Adductor muscle was assessed for capillary density.

**Results:** By day 10 post-surgery mice injected IM showed better recovery in LDPI, compared with those mice injected IV (LDPI  $0.30 \pm 0.06$  vs.  $0.15 \pm 0.05$ ;  $P < 0.05$ ). This was true for CD34<sup>+</sup> cells, EPCs and PBS. Mice receiving CD34<sup>+</sup> cells IM recovered better from day 10 to 21 when compared to mice injected IM with EPC or PBS (day 21 LDPI  $0.45 \pm 0.04$ ,  $0.35 \pm 0.05$  and  $0.28 \pm 0.05$ , respectively;  $P < 0.05$ ). Immunohistochemical staining of adductor muscles revealed capillary density was highest in mice receiving CD34<sup>+</sup> cells IM, compared with those mice receiving EPC IM, PBS IM, CD34<sup>+</sup> IV, EPC IV, and PBS IV ( $155 \pm 9\%$ ,  $140 \pm 5\%$ ,  $135 \pm 7\%$ ,  $115 \pm 10\%$ ,  $110 \pm 10\%$  vs. 100% for PBS IV, respectively;  $P < 0.05$ ).

**Conclusions:** This study provides evidence that direct IM injection of CD34<sup>+</sup> cells into the ischaemic hindlimb delivers the best angiogenesis outcome among various cell therapy techniques investigated in this study.

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**Association of Left Ventricular Motion and Central Blood Pressure Waveform Morphology**

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**Background:** Central blood pressure is a determinant of cardiovascular outcome however it can be described by parameters other than systolic and diastolic pressure with central augmentation index (AIx) often utilised. Although generally considered as determined by peripheral pressure wave reflection the not all data are consistent with this interpretation of AIx. We hypothesised that the velocity of the base of the heart during systole may influence central pressure waveform morphology, including the augmentation index.

**Methods:** We studied the carotid pressure waveform, aortic stiffness and endothelial function in 20 healthy young males (full data available in 19). Arterial stiffness was measured by carotid-femoral pulse wave velocity (cPWV), endothelial function by Peripheral Arterial Tonometry and central BP waveform by carotid applanation tonometry. Basal cardiac motion was assessed with pulsed wave tissue Doppler imaging of the anterior mitral annulus.

**Results:** Carotid AIx decreased after the administration of GTN by  $11.3 \pm (\text{sem})4.6\%$  ( $P = 0.02$ ) however time to the inflection point (Ti) did not change. During systolic contraction at both baseline and after GTN the time to peak annular systolic velocity was directly related to, and always preceded, carotid Ti ( $R^2 = 0.81$ ;  $p < 0.01$ ). Carotid Ti and AIx were not related to cPWV or endothelial function.

**Conclusion:** Rather than only being a consequence of arterial properties Ti, and therefore central AIx, may be substantially determined by left ventricular function. These findings question the interpretation of central AIx as a measure of pressure wave reflection and aortic stiffness and therefore impact on its interpretation in diagnosis and treatment of cardiovascular risk.

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**Augmentation Index (AIx) and Augmentation Pressure (AP) in a Cardiac Population**

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**Background:** Arterial stiffness and pressure wave reflection are associated with cardiovascular risk. The AIx is