Appendix I:
Diagnostic Tests to Determine Vascular Supply

DIAGNOSTIC TEST	DESCRIPTION
Arterial Duplex Scan	■ Non-invasive ultrasound test that can identify macro- and microvascular changes in the arterial tree. ■ Used to diagnose aneurysm and large vessel stenosis >50%. ■ Patients with suspected superficial artery stenosis and claudication may undergo duplex scanning to identify a lesion that is amenable to angioplasty, before subjected to angiogram (Sales, Goldsmith & Veith 1994; Cao et al., 2011). ■ Non-invasive arterial duplex scan as having sensitivity[G] and specificity rates greater than 90% (Kravitz, McGuire & Shanahan, 2003).
Continuous Wave Doppler	■ Old technology. It is highly recommended to use in conjunction with duplex imaging to visualize the arteries (Cao et al., 2011).
Plethysmography	■ Records the "pulse volume recording" – another old tool that can establish diagnosis with limited accuracy (Cao et al., 2011). ■ May be a initial diagnostic tool for persons with diabetes that do not have compressible arteries but should be used in conjuction with duplex scan (Cao et al., 2011).

DIAGNOSTIC TEST	DESCRIPTION
Transcutaneous Oxygen (T_cpO_2)	■ Measures absolute oxygen partial pressure in the dermis. According to Goldman and Salcido (2002), T_cpO_2 less than 20 mmHg gives a guarded prognosis for healing. ■ 40 mmHg is a good indication for healing (Goldman & Salcido, 2002). ■ T_cpO_2 should be measured on upper leg and dorsum of the foot for best results. ■ Areas of callus, edema or bony prominences produce inaccurate results. ■ Valuable for evaluating perfusion and is a good predictor of amputation in the lower limbs (Adler, Boyko, Ahroni & Smith, 1999; Ballard, Eke, Bunt & Killeen, 1995; Lehto, Ronnemaa, Pyorala & Laakso, 1996; Mayfield, Reiber, Sanders, Janisse & Pogach, 1998; Pecoraro, Ahroni, Boyko & Stensel, 1991; Reiber, Pecoraro & Koepsell, 1992). ■ $T_cpO_2 < 30$ mmHg was an independent predictor of diabetic foot ulceration (McNeely et al., 1995).
Toe and Ankle Pressures	■ Systolic toe and ankle pressures are measured with a fitted occluding cuff placed most often around the base of the first toe and around both ankles. ■ Toe pressure of > 45 mmHg is necessary for optimal healing (Apelqvist, Castenfors, Larsson, Stenstrom & Agardh, 1989; Frykberg et al., 2000). ■ Most patients with toe blood pressures > 30mmHg healed with conservative management (Apelqvist et al., 1989; Kalani, Brismar, Fagrell, Ostergren & Jorneskog, 1999; Royal Melbourne Hospital, 2002). ■ With ankle pressures < 80mmHg, most patients had an amputation or died before healing occurred (Apelqvist et al., 1989). ■ Kalani et al. (1999) suggests a cut-off of 25mmHg for T_cpO_2 and 30mmHg for toe blood pressure as predictors of wound healing, with T_cpO_2 being the better predictor in patients with diabetes and chronic foot ulcers. Toe pressures, however, may be more technically and economically feasible. ■ Toe pressures for persons with diabetes were more reliable than persons with false negative ABPI's and lower limb neuropathy (Cao et al., 2011).

APPENDICES

DIAGNOSTIC TEST	DESCRIPTION
Ankle-Brachial Pressure Index (ABPI)	■ ABPI or ratio of systolic blood pressure in the lower extremity to blood pressure in the arm is a common clinical measure of reduced circulation (Boyko et al., 1999; Cao et al., 2011). ■ First line of assessment for diagnosing vascular status though insensitive to determine the extent of occlusive disease compared to angiography (Cao et al., 2011). ■ This should not be the sole diagnostic test performed (Cao et al., 2011). ■ In the diabetic population, ABPI results can be unreliable (falsely negative; for example ABPI > 1.2) due to calcification of the arterial vessels (Apelqvist et al., 1989; Cao et al., 2011). **CAUTION:** This should not be the sole diagnostic test performed. ■ In persons with diabetes, ABPI results can be unreliable (falsely negative) due to calcification of the arterial vessels (Apelqvist et al., 1989; Cao et al., 2011). Sensitivity (63-100%) and specificity (85-97%) were reported for persons with diabetes (Cao et al., 2011).
Angiography	■ Sensitivity (92-98%) and specificity (88-98%) is high for all 3 types of angiography (Cao et al., 2011). ■ **Diagnosing magnetic resonance angiography (MRA)** Contraindicated for persons with metal foreign implants (ie. pacemaker, aneurism clips, orthopedic screws, pin, etc.) ■ **Computed tomography, angiography (CTA)** Exposure to nephrotoxic contrast medium (Cao et al., 2011). ■ **Digital subtraction angiography (DSA)** Gold standard and traditional diagnostic tool. Potential for catheter puncture complications though risk is low – 0.7% risk (Cao et al., 2011).