Results: 423 infrainguinal bypasses to below knee target vessels (popliteal 122 (29%), tibial 238 (56%), pedal 63 (15%)) were analyzed.

258 (61%) patients received a single segment GSV, 118 (28%) an AAV and 47 (11%) a prosthetic conduit. Postoperative outcomes had no significant differences among groups. Primary patency at 2 years for the GSV, AAV and prosthetic groups was 47%, 26% and 40% respectively. AAV demonstrated the poorest primary patency rates, though non-statistically significant compared to the prosthetic group (P = .068). Primary assisted patency at 2 years for the GSV, AAV and prosthetic groups was 70%, 52% and 45% respectively. The primary-assisted patency of GSV was significantly superior to both AAV (P = .008) and prosthetic grafts (P = .002), which did not differ significantly from one another (P = .479). Secondary patency at 2 years for the GSV, AAV and prosthetic groups was 75%, 57% and 46% respectively and again AAV and prosthetic grafts did not differ significantly from one another (P = .212). In Cox regression analysis primary, primary assisted and secondary patency were positively predicted by GSV (HR 1.65, P = .001; HR 1.65, P = .006; HR 1.72, P = .006 respectively) when compared to AAV, but there was no difference between AAV and prosthetic grafts. Neither target artery (popliteal vs. tibial/pedal) or runoff score, nor statins showed any predictive value. Limb salvage at 2 years for the GSV, AAV and prosthetic groups was 87%, 77% and 74% respectively with no significant differences among groups.

Conclusion: When GSV is not available, alternative autologous vein conduits do not offer a significant patency advantage in midterm follow up over prosthetic bypasses for below knee targets.

Renal Outcomes Following Fenestrated and Branched Endografting
Hospital Cardiologique CHRU, Lille, France

Introduction: The purpose of this study was to analyze immediate and long-term renal outcomes (renal function and renal events) after fenestrated (FEVAR) and branched endovascular aortic aneurysm repair (BEVAR).

Methods: All FEVAR and BEVAR performed between October 2004 and October 2012 were included in this study. Postoperative acute renal failure (ARF) was defined and classified according to the RIFLE criteria. Renal volume (calculated with a 3D workstation) and eGFR (estimated with the MDRD formula) were evaluated before the procedure, before discharge, 12 months after and yearly thereafter. Renal stent occlusion, dissection, fracture, stenosis, kink, renal stent related type III endoleak and renal stent secondary intervention were all considered “renal composite events” and analyzed. A time-to-event analysis was performed for renal events and renal secondary interventions.

Results: During the study period, 225 patients were treated with FEVAR and BEVAR. Renal target vessels (n = 427) were perfused by fenestrations (n = 274) or branches (n = 53). Median follow-up was 2.4 years (2.2–2.6). FEVAR and BEVAR were associated with similar mean renal artery diameter and renal artery angulations. Preoperative renal stenosis rate was higher with BEVAR (p < 0.021). Technical success was achieved in 96.4% of patients. Postoperative ARF was depicted in 64 patients (29%), requiring transient hemodialysis in 12 patients (5.3%) and permanent hemodialysis in one case (0.44%). An additional 4 patients (1.9%) required hemodialysis during follow-up. Significant decrease in right renal volume (17.07 cm³; 95% confidence interval (CI), 12.52–21.67), left renal volume (24.55 cm³; 95% CI, 19.14–29.97) and eGFR (12.54 ml/min per 1.73 m²; 95% CI, 8.43–16.66) were observed during follow-up (p < 0.000). The 30-day, 1-year and 5-year freedom from renal composite event was 98.1% (95% CI, 97.2%–99%), 95% (95% CI, 93.5%–96.5%) and 87.5% (95% CI, 84.7%–90%). Freedom for renal composite events was significantly higher in FEVAR (p < 0.048) compared to BEVAR. The 30-day, 1-year and 5-year freedom from renal occlusion was 99.5% (95% CI, 99%–100%), 98.5% (95% CI, 97.6%–99.4%) and 93.8% (95% CI, 91.7%–95.9%) after FEVAR and BEVAR (NS). Median time
to renal related secondary intervention was 450 days (Q1—Q3, 124—991.5) for both procedures.

**Conclusion:** FEVAR and BEVAR are durable options for the treatment of complex aortic aneurysms and are associated with a low renal morbidity rate. Freedom from renal composite events was significantly higher with FEVAR. Renal volume is as accurate way to depict renal dysfunction during follow-up.

**Angiosome Guided Surgical Revascularization; the Truth and Falsehood**

K. Yie

**Sejong General Hospital, South Korea**

**Introduction:** The usefulness of angiosome guided therapy in critical limb ischemia has been under debating. We tried to evaluate the efficacy of angiosome guide revascularization comparing the results between complete revascularization using great saphenous vein (GSV) Y graft and single graft bypass.

**Methods:** From Jul 2008 to Dec 2012. a total of 102 CLI patients underwent BTK or pedal bypass surgery for critical limb ischemia. 71 pts (83 limbs) underwent single graft bypass (Anterior tibial artery or posterior tibial artery), otherwise 31 patients (37 limbs) underwent complete revascularization using GSV Y graft.

**Results:** There is no statistical difference between both two groups in terms of preoperative demographics, postoperative complications and mean 3 years follow up results. However, in the patients who underwent single graft bypass surgery, primary patency is longer in positive pedal arc group compared to no pedal arch group (85% in positive pedal arc group vs. 47.6% in no pedal arch group). In the patients who underwent Y graft bypass surgery, primary patency was similar in both groups (87.5% in positive arc group vs. 80% in no pedal arch group).

**Conclusion:** Angiosome guided treatment is necessary in the cases of negative pedal arch. If the patients shows negative compatibility in terms of wound location with angiosome area, and poor pedal arch, complete revascularization using GSV Y graft or angiosome guided single bypass surgery is reasonable. Otherwise, if pedal arch is competent in peri-operative evaluation, single bypass surgery regardless of angiosome is sufficient.

**One Bout of Calf Raises Induces Improvement of Mitochondrial Function in Claudicants**

M. van Schaardenburgh, M. Wohlwend, Ø. Rognmo, E. Mattsson

**Department of Circulation and Medical Imaging, Norwegian University of Science and Technology, Trondheim, Norway**

**Introduction:** Mitochondria in patients with PAD do not produce as much ATP as mitochondria in normally perfused muscle. Therefore patients with PAD do not only have a decreased supply of nutrients and oxygen, as a result of diseased arteries, but the concurrent mitochondrial respiratory defects also lead to an even lower ATP production from the amount of O2 present.

Ischemic preconditioning is known to improve functionality and to increase the number of mitochondria. We wanted to explore whether any impact on the mitochondria would be seen already after one bout of training. The extended goal being whether specific “mitochondrial training” with increased ATP production to follow could improve symptoms for patients with claudication.

**Methods:** Two groups were tested: a control group with healthy elderly individuals (n = 11) and another group with intermittent claudication (n = 8).

In patients with claudication we used one bout of continuous calf raises followed by 5 extra repetitions after initiation of pain. This approach secured local ischemia and reperfusion = ischemic preconditioning in the gastrocnemius muscle. The control group performed 100 calf raises.

Biopsies from the gastrocnemius muscle were taken 15 minutes prior to the training and another four at fixed time intervals (15 min, 1 h, 3 h and 24 h) after the single bout of exercise.

Respiratory capacities were determined by using mitochondrial respirometry. The main substrates used were octanoylcarinate, glutamate (fatty acid oxidation), malate (complex I), succinate (complex I and II), and FCCP and rotenone (complex II).

Repeated measures mixed model was used for statistical analysis. Statistical significance was indicated by a value of p <0.05.

**Results:** Within the group of claudicants Complex I respiratory capacity reached the highest value at 24 hours (15.4 ± 3.14) compared to the lowest (8.9 ± 3.28), (p = 0.04). Also fatty acid oxidation had the highest value at 24 hours (9.2 ± 2.56), compared to the lowest (4.7 ± 2.45), (p = 0.07).

**Conclusion:** The muscular mitochondrial respiratory capacity improves already after one bout of ischemic preconditioning in claudicants. Calf raise exercise with five extra repetitions after initiation of pain might therefore be an alternative to reach specific “mitochondrial training” of the gastrocnemius muscle. This concept is promising and might be a new conservative approach to intermittent claudication; leading to a decrease of necessary vascular interventions.

**Influence of Microbiology and Wound Scores in the Diabetic Foot Syndrome Outcome**

A. Bravo Molina, J.P. Linares Palomino, S. Lozano Alonso, R. Asensio García, J. Parra Ruiz, J. Hernández Quero

**Hospital Universitario San Cecilio, Granada, Spain**

**Introduction:** The diabetic foot syndrome (DFS) is an important complication of DM resulting very often in amputation, disability and reduced quality of life. Little is known about the relationship between the different wound classifications and the microbiology of DFS. We aimed to identify accurate predictors to establish the best empiric therapy and to reduce the rate of amputations.

**Methods:** Prospective study of 250 consecutive patients diagnosed of DFS from January 2009 to September 2013 attended at our institution. Tissue samples for culture were obtained at admission and 48 hours after. Wound classification scores were recorded at admission and a re-evaluation was performed 48 hours after.

**Results:** Median age was 66 years (22—91), being male 199 patients (80%). Hundred and five patients had received antibiotics prior to hospital admission and 162 (65%) had femoro-popliteal or tibial ischemia. Osteomyelitis was present on plain X-ray in 51 patients (36%). Infection was mono-microbial in 131 patients (52%). *Staphylococcus aureus* was the most frequent pathogen (76 patients, 30%); being MRSA in 26% (20/76) *E. coli* and *E. faecalis* were 2nd and 3rd most frequent pathogens. Two hundred and nine patients (85%) needed amputation being major in 25 patients (10%). Seven patients (3%) died during hospitalization. After one year of follow-up, 51 patients (21%) were readmitted because of worsening and 38 needed minor or major amputation.