Year of Placement: August 2009 to July 2010

This form should be completed by Clinical Academics who wish to host a F2 Academic Foundation trainee for a 4 month academic research placement during the 12 month period August 2009 to July 2010. This form will be given to potential F2 Academic Trainees in order to inform their preferred placement choices and will be on the website. This form is 2 A4 sides, and should not be extended.

| Educational Supervisor(s) For F2 Academic Placement: | Philip Chan |
| Nominated Foundation Programme Director: | Mr J Beard |
| Academic Unit or Group: | Vascular Surgery |
| E-mail: | p.chan@shef.ac.uk |
| Tel: | 01142269124 |
| Address: | Sheffield Vascular Institute, Northern General Hospital, S5 7AU |
| Title of Project for the F2 Academic Placement: | Clinical Trial of Vacuum dressings in diabetic foot surgery |
| Where will the Project for the F2 Academic Placement be Based? | Northern General Hospital and Doncaster Royal Infirmary |

Description of the Academic Project for the F2 Academic Placement:

**Background:** Diabetes is one of the most common serious medical conditions in the world, and its incidence is increasing, in both prosperous and developing countries. Diabetic foot infection is a common disabling complication of diabetes. Foot infection can often lead to surgery; when the infection is extensive and destructive, this surgery may take the form of amputation. The incidence of amputation in diabetes is around 5 per thousand person years.

The serious consequences of diabetic foot infections are related to the effects of diabetes on blood supply, nerve function and wound healing. Diabetic patients frequently have arterial occlusion affecting smaller arteries below the knee; this decreased blood supply leads to impaired healing. Diabetic neuropathy causes predominantly sensory loss in the foot, with particular loss of pain, vibration and positional sense. Loss of perception of minor trauma leads to loss of avoidance reactions; calluses and ulcers on pressure points in the foot result. Finally, there does appear to be an ill-defined decrease in wound healing ability; this might be related to blood vessel occlusion at progressively smaller levels. Surgery for diabetic foot infection usually involves loss of one or more toes, and open drainage of the infected foot wound. The time to healing is generally several months; and the time to discharge from hospital is at least some weeks. Despite correction of macrovascular disease, this process is slow, and sometimes wounds do not progress to healing, and amputation at the below knee level results.

No dressing regime is especially effective in this condition. Although the foot is anatomically suitable for free drainage of foot wound, the wounds are deep and further necrosis occurs in the deep areas. We have observed encouraging results with vacuum dressings after diabetic foot surgery. Even extensive wounds in the presence of significant vascular disease have progressed to healing, in situations where the likely outcome would have been amputation. We believe that the low pressure suction removal of exudates is beneficial, and possibly there may be some stimulant effect to the inflammatory process and cellular components of wound healing.

**Project Aims and Methodologies:**

We wish to test the scientific hypothesis that vacuum dressings after ACUTE diabetic foot surgery leads to improved outcomes, measured in the following ways

1. maximum % healing at 3 months
2. Time to hospital discharge
3. Cost effectiveness of VAC and standard dressings

80 patients over 2 years will be randomised after diabetic foot surgery to two groups. Group 1 will receive early vacuum dressings; applied on the day of surgery, or within 72 hours after surgery. Group 2 will receive standard dressing treatment, determined by surgeons’ usual preference, with moist dressings, hydrocolloids, and/or alginate; there will be a clinical protocol to allow conversion in either direction, in the event of failure of dressings to achieve healing.

All patients with vascular impairment will be treated in standard fashion, to restore in line arterial blood flow to the popliteal artery at the level of the knee joint, prior to, or within 14 days of surgery.

Description of Training the F2 Academic Trainee Will Receive and Access to Research Facilities:
The trainee will be joining the project a few months after its start. They will participate in patient recruitment and consent, and complete CRFs. The novel methodology of wound assessment involves 3D photography, and they will learn to do this and record and analyse the data. They will receive weekly supervision meetings with the PI.

The trainee will receive training in running a randomised clinical study, and be primarily responsible for recruitment and completion of CRFs. The trainee will additionally be trained in database management, and also in the principles of cost benefit analysis. Additional training is offered in the formal assessment of diabetic neuropathy and the measurement of TcPO\textsubscript{2}.

The trainee will be based in the Academic unit of vascular surgery at the northern General. They will have access to computing and photography analysis equipment. Their co-researchers are experienced clinical trialists and there is a senior lecturer in health economics in the department.

References (Only Include Top 5):


Outline of the F2 Academic Placement Project Plan (including literature review, presentation and writing up and assessment of the placement):

**Month 1:** recruitment, measurement, follow-up and database management of trial. Literature review on one aspect of diabetic foot neurovascular disease. Presentation at unit journal club.

**Month 2:** recruitment, measurement, follow-up and database management of trial. Presentation at joint research meeting with diabetic unit (Prof Tesfaye)

**Month 3:** recruitment, measurement, follow-up and database management of trial. Presentation at Doncaster and Sheffield vascular meetings

**Month 4:** recruitment, measurement, follow-up and database management of trial

Report on achievements, reflections of learning points and problems. Presentation at full North Trent vascular research meeting.