

Job Title: Implant Design Engineer

Centre: Fitzbionics

Department: Design Office

Reporting To: General Manager



FURTHER PARTICULARS

Role Description:

Fitzpatrick Referrals is a specialist veterinary referral practice dedicated to expert care and safe clinical decision-making together with compassionate communication. The organisation comprises of a centre for orthopaedics and neurology in Godalming, and Fitzbionics Ltd for custom implant manufacturing in Hemel Hempstead. The facilities are state of the art in diagnostics, production and treatment.

The custom implant service is comprised of a team of highly skilled design engineers specialising in veterinary orthopaedics, and machinists specialising in orthopaedic implant manufacture who all work together to serve the clinical team within Fitzpatrick Referrals.

The successful applicant will be provided with training in orthopaedic design specifically for small animals and manufacturing practices to optimise design and production. You will be required to assist the design and manufacturing team in taking control of individual cases, daily schedule of production and associated tasks, and regularly attend surgery to assess practical issues associated with insertion of the device with the aim of improving design, instrumentation and surgical approach. You will be encouraged to get involved with all aspects of this service.

Duties will involve processing CT imaging using Mimics Materialise software including digital radiographic measurements and producing 3D CAD designs using NX CAD software by liaising with clinical and non-clinical teams on one side to plan for the best solution for the patient within specified timeframe and the engineering team on the other to ensure production objectives are met in a timely manner.

Due to the geographical locations of the services in Godalming and the manufacturing unit in Hemel Hempstead, it is envisaged that the implant design engineer will be stationed full-time at Hemel Hempstead and regularly visit the practice in Godalming for discussion, review and to attend surgery.

The successful candidate must be a graduate engineer and preferably have some experience in orthopaedic concepts and design. In addition, the candidate will be care driven, and with excellent communication skills, be exceptionally organised, thorough and be able to operate in a 24/7 team environment.

Professional Development Objectives:

The implant design engineer will:

1. Be able to design routine implant cases, process documentation in accordance with local practices and improve on implant designs and associate instrumentation.
2. Be able to take on new and complex designs by liaising with the surgical team establishing design and surgical protocol for further development.
3. Understand skeletal and muscular functions of various breeds of small animals in order to optimise implant designs and generate new concepts.
4. Understand surgical approach and constraints to optimise implant and surgical instrumentation designs.

Implant design

The implant design engineer will be responsible for taking control when new cases are allocated by;

- Collecting CT and x-ray scans and the treatment requirements from the clinical team.
- Processing CT scans using Mimics software and by applying segmentation technique generating 3D models of the bone geometry.
- Importing bone geometry into NX CAD software and designing implant individually and/or as an assembly.
- Producing design proposal identifying any special surgical requirements and reviewing the design with the clinical team for suitability of the design and surgical approach.
- Producing special surgical instrument designs where applicable and reviewing them with the clinical team.
- Reviewing proposed designs with the manufacturing team to ensure production feasibility and identifying special requirements and estimating time required for the manufacturing.
- Once the designs are approved producing manufacturing specifications such as engineering drawings using standard drafting practices and surgical diagrams and instructions.
- Assisting production team for final preparation which will include polishing, final assembly inspection to ensure design objectives are met, cleaning and packaging with appropriate labels where required.
- Collecting all as a complete package including surgical planning instructions and delivering the implant in time for the surgery.

New concepts development

As a part of a wider design team you will be required to work with a selected group of clinicians who will provide surgical and clinical information and conceptual design requirements and feedback from the surgical procedures. The aim of this is to implement changes that are identified to improve implant and the surgical instrument designs. However, from time to time, it may be necessary for the implant design engineer to attend surgery to observe the procedure and record surgical outcome to appreciate many constraints that are present. This may include helping to perform surgical trial using saw bones or cadavers to prove the viability of new implant designs and the practicality of using surgical instruments and hence the effectiveness of bone preparation technique and implant fit. This work is generally performed at the surgery in Godalming. Reviewing of the designs with the senior clinicians, design team and manufacturing team is the vital part of the process to introduce changes efficiently. In this modern fast moving patient treatment service flexibility is required in line with the surgery which may continue late in the evening.

Limb fitting

Patients that have undergone limb amputation require artificial limb fitted. These patients are generally fitted with a percutaneous implant where an artificial foot is directly attached to the implant. As part of the implant design process, the implant design engineer will be responsible for the designing, manufacturing and servicing and implementing any subsequent improvements to the limb identified by the clinicians. This process involves hands-on approach to all level of activities.

Design records

As a general practice all patient related activities are methodically recorded. It is important that these records are kept in recognized ordered for future reference and traceability.

Other duties

The implant design engineer will be required to carry out other relevant duties as and when required.

- Maintain good record of all specifications and be able to access the records by others is a key factor of good housekeeping.
- Attendance at journal and book clubs and in-house lectures for training purpose is strongly emphasised.
- From time to time take part in clinical research as an engineer and assist with preparation of scientific and general publications.
- Represent and promote the practice, its aims and values at all times.
- In addition to your main duties you will be required to carry out such other duties consistent with your position to meet the needs of the business and as the Company may require from time to time.

Employee Signature: _____ **Date:** _____
Employee Name:

Line Manager/HR Signature _____ **Date:** _____
Line Manager/HR Name:

PERSON SPECIFICATION

The skills, abilities, experience and knowledge outlined below provide a summary of what is required to carry out this job effectively. They also form part of the selection criteria on which the decision on who to appoint will be made. Please ensure that you show how you meet the criteria outlined below in your application.

Requirement	Essential	Desirable
Qualifications and experience	<ul style="list-style-type: none"> • Graduated at MEng/MSc level in engineering discipline • Have at least one year experience using CAD software, preferably Siemens NX 	<ul style="list-style-type: none"> • Have at least one year practical experience in veterinarian or human bioengineering • Have experience using CT image processing software
Knowledge	<ul style="list-style-type: none"> • Good knowledge of engineering design concepts • Good knowledge of general manufacturing processes and material properties • Good knowledge of engineering drawings and specifications 	<ul style="list-style-type: none"> • Sound knowledge of biomechanics • Good knowledge of orthopaedics implant concepts and practices
Personal and engineering skills	<ul style="list-style-type: none"> • Able to communicate confidently in clear English (verbal and written) with senior clinical professionals and colleagues • Good interpersonal skills with both engineers and clinicians • Good problem solving and critical analysis skills • Good ability to perform practical engineering tasks required for limb fitting • Committed to patient care • Have compassion towards animals and their welfare 	<ul style="list-style-type: none"> • Have practiced in a manufacturing environment for at least a short time
Personal Characteristics	<ul style="list-style-type: none"> • Work under very tight timeframe • Works well in a team • Must show initiative and be self-motivated • Good problem solving ability • Good conflict resolution • Awareness of personal limitations and an enquiring attitude to patient treatment 	
Other	<ul style="list-style-type: none"> • Right to work in the United Kingdom • Have driving license and transport to attend between sites 	
Values	<ul style="list-style-type: none"> • Integrity: We endeavour always to do the right thing • Innovation: We challenge ourselves to develop new and better ways to solve problems • Care: We care passionately about what we do • Education: We are totally committed to learning and sharing knowledge and information • Community: We work best when we work as a team 	

Key Performance Indicators

Area	Detailed KPI	Measure