

An Introduction to Orthopaedic Surgery

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An Introduction to Orthopaedic Surgery

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Orthopaedics is a surgical speciality that focuses on the treatment of injuries and abnormalities of the musculoskeletal system. This encompasses the bones, joints, muscles, tendons, nerves and ligaments, which are functionally required for a reasonable standard of life.

The term Orthopaedics is derived from the Greek language with 'Orthos' meaning straight/correct and 'paidion' meaning child. Although today Orthopaedics is not limited to paediatrics it includes people of all ages along with various sub specialities such as hand surgery, shoulder and elbow surgery, lower limb surgery, knee surgery, foot and ankle surgery, spinal surgery and trauma surgery.

It is a very rewarding speciality that provides the opportunity to address the clinical morbidity that has limited the patient's function and mobility, and restore the function. A common example is that of osteoarthritis of the hip joint, which makes gait both painful and restricted. Yet most patients who are treated surgically and have good physiotherapy follow up have excellent pain relief and mobility.

However Trauma and Orthopaedics is not a speciality for everyone. It demands sound diagnostic and surgical skills along with good spatial awareness, 3-dimensional reasoning, thinking and communicating effectively under pressure, and to work in a physically and intellectually challenging environment.

Life as an Orthopaedic Surgeon

Each day typically begins with an early morning ward round at about 7.30 am to examine patients who were operated the previous day and to monitor their recovery. Following this there is a Trauma meeting that involves several members of the multidisciplinary team (MDT);

- On call team – To discuss new patients admitted to the ward overnight.
- Core surgical trainees (CT) – To understand the patient's general health and learn the general principles of management, including the surgical options.
- Speciality Registrars (ST), Registrars, Middle Grade

Doctors – To formulate a surgical plan, construct an operating list, liaise with theatre and anaesthetist, and provide appropriate input in the various stages of the patient's care.

- Consultants – To coordinate the meeting, decide on the most appropriate management and be responsible for the overall care for the patient.
- Medical students – To learn the fundamentals of Orthopaedics.
- Emergency physicians (A&E doctors) – To learn how the patients they have seen the previous day are managed by the orthopaedic team.
- Radiologists – To help junior doctors understand difficult X-ray and discuss/ascertain the need for any further investigation (e.g., CT scan for fracture of calcaneum or MRI scan for knee injury).

Next there is a focused ward round to see the patients on the morning list and to ensure they have been fasted, still consent to surgery, know what the procedure involves and that the correct body part/site/side is marked for surgery.

The morning theatre list then commences at around 9am and usually finishes sometime in the early afternoon. Following this patients from the afternoon list are seen and the afternoon list commences. At the end of the list a post ward round is performed to discuss with the patient the operation that has been performed and to check patient's observations.

Elective lists include operations such as hip and knee replacements and generally finish on time. Trauma lists cover many type of injuries such as fractured femoral necks, long bone fractures, soft tissue injuries and amputations; finish times are thus less predictable.

One of the advantages of being an orthopaedic surgeon is that it is very practical, very direct, produces immediate results and there is great variety of work on different days such as;

- Outpatient clinics (elective/trauma)
- Operation sessions (trauma/elective)

- On call
- Administrative work
- Clinical governance
- Educating and apprising the trainees
- Research

An orthopaedic surgeon will spend about half their time in theatre operating with the other half doing fracture clinics, ward work and elective clinics. Although clinics may not appear as exciting as theatre sessions, the post-operative clinic consultations are incredibly rewarding as you can observe the significant and often drastic improvement of the patient's quality of life.

Throughout the life of an Orthopaedic surgeon there is emphasis on deep vein thrombosis prophylaxis as they are most common in Orthopaedic procedures and emphasis is also given to strict infection control. An example being the space like scrubs worn during hip replacement operations. The reason so much caution is taken is that infection can lead to osteomyelitis, which can completely ruin any progress and may force the implant to be removed.

However unfortunately Orthopaedics does appear to be a male dominated speciality possibly as a reflection of the lack of part time/flexible work opportunities. The

British Orthopaedic Association's 2009 census indicated that females comprise of just over 12% of trainees and 4.2% of consultant workforce.

There is also the opportunity for substantial private practice in the UK enhancing income further but this is dependent on the Surgeons results and experience as well as how much they split their time between private and NHS work.

In reward for the long working hours, demanding on-calls and the opportunity for private practice, the average earning of an Orthopaedic consultant surgeon in the UK is considered to be at par or perhaps more than most other Medical and Surgical specialities.

All consultants have the option of private practice enhancing income further but this requires all the appropriate documentation to be completed with private insurance companies such as Aviva. The time a Surgeon spends on private practice must not impact on their NHS work in their agreed NHS contract. However they can alter their NHS contract to go part time in the NHS to enhance the time they spend on private practice. So there is no overall rule to how much time one can spend in private practice but it is dependent on the individuals NHS contract.

Facts and figures

The competition ratios for a selection of different deaneries are shown below.

Deanery	Competition ratios 2009	Competition ratios 2010	Competition ratios 2011	Competition ratios 2012
London	CT 1; 6:1	CT1; 7:1	CT 1; 7:1 ST3; 9.7:1	
Yorkshire and Humber deanery	CT1; 4:1	CT; 4.5:1 ST1; 6:1	CT; 2.4:1 ST3; 5:1	
North Western	CT1; 13:1	CT; 6:1	CT; 4.5:1 ST3; 10.5:1	CT: 4.6:1 ST3: 7:1
National average				ST3: 3.8:1

The fiercest competition is for ST3 (Speciality Registrar) posts with an average of 10 applicants for every post meaning commitment, understanding and a good portfolio are mandatory. However in 2012 the competition for ST3 posts dropped somewhat to 3.8 applicants per post, probably due to increased number of posts.

The Future

There is increasing emphasis on evidence-based medicine for both new and established surgical techniques and in which circumstances they should be used to maximise outcomes.

For example, there is a greater prevalence of minimally invasive surgery in Orthopaedics. In upper limb surgery, large rotator cuff tears can now be treated through laparoscopic (keyhole) surgery. This also allows greater evaluation of the shoulder during surgery. Another

example is the treatment of meniscal tears of the knee. Open surgery takes several weeks to recuperate and rehabilitate the patients whereas patients can recover within 48 hours of keyhole surgery. Keyhole surgery also results in smaller scars and lower rates of infection.

Over the last decade research has been looking at tissue engineering of cartilage using different growth factors such as TGF- β , IGF-1, FGF-2, and BMP-7 aiming to replace patient's damaged cartilage. An example would involve isolating mesenchymal stem cells and then growing and differentiating them into chondrocytes in the laboratory (Figure 1). These could then be seeded onto a biomaterial matrix and re implanted into the patient. Unfortunately this is currently far from clinical practice as most of this work is being performed on animal models, which have several differences to humans. Once deemed safe on animals the work would then have to be successfully translated to humans in clinical trials before being

approved for use on the general population. More tendon and ligament healing processes as little is known recently research has delved into the understanding of about their regenerative capabilities.

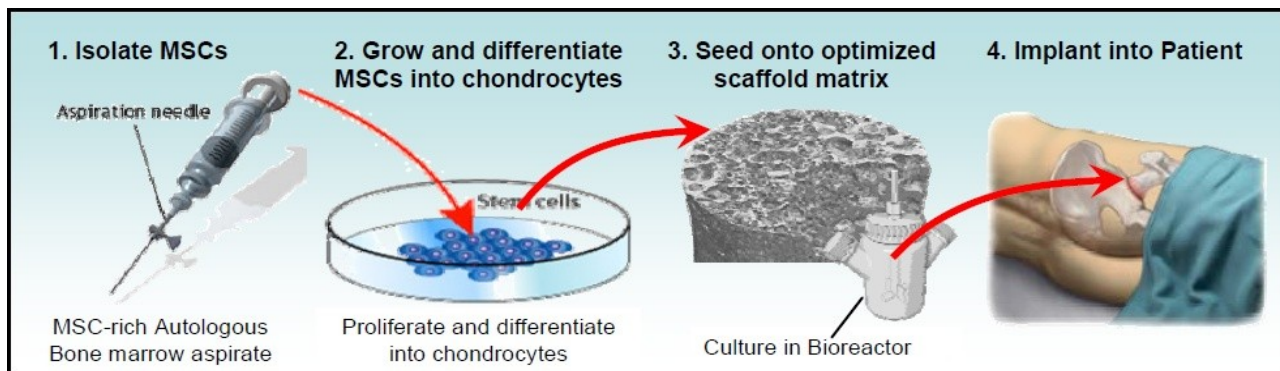
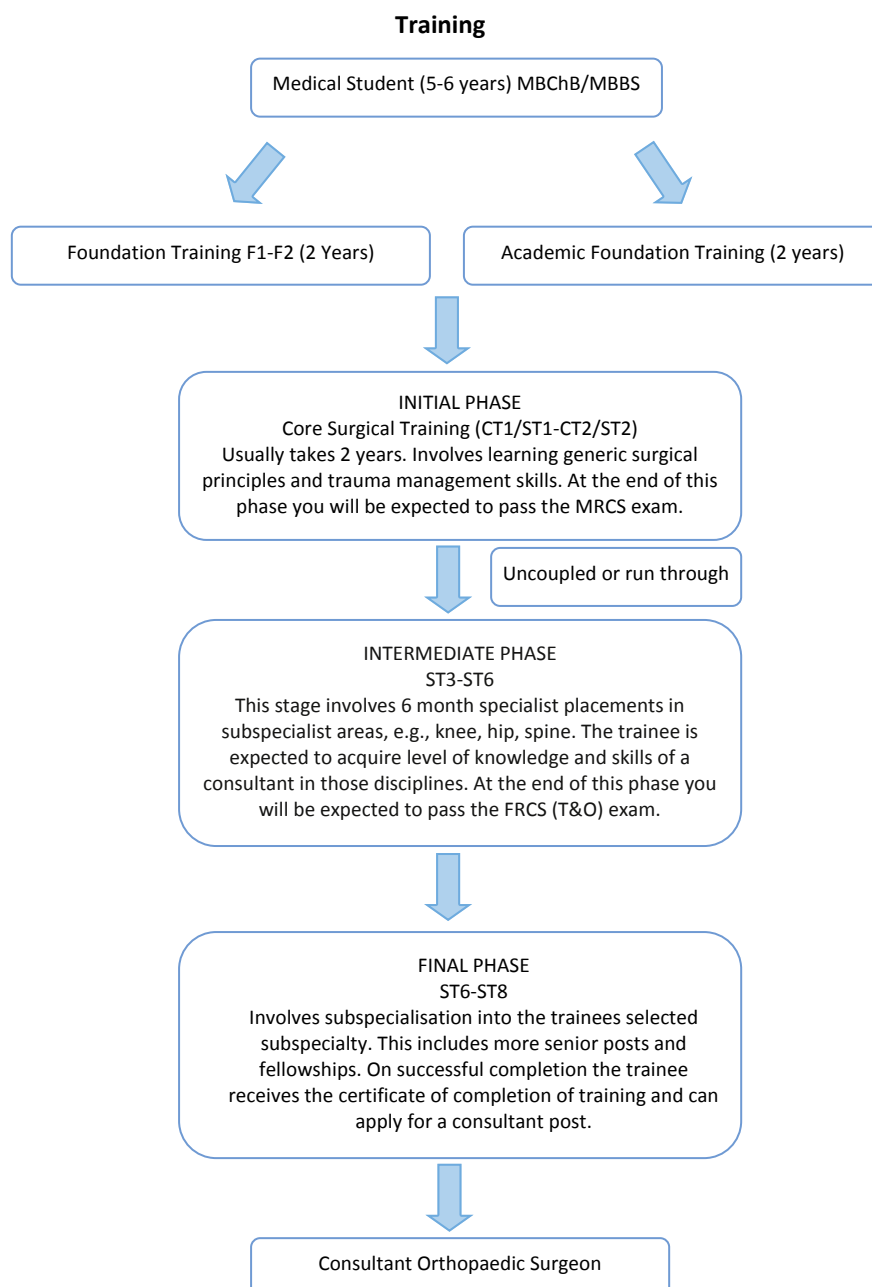


Figure 1: Diagram summarising the potential clinical application of lab produced cartilage. With courtesy of Oseni A et al.



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