

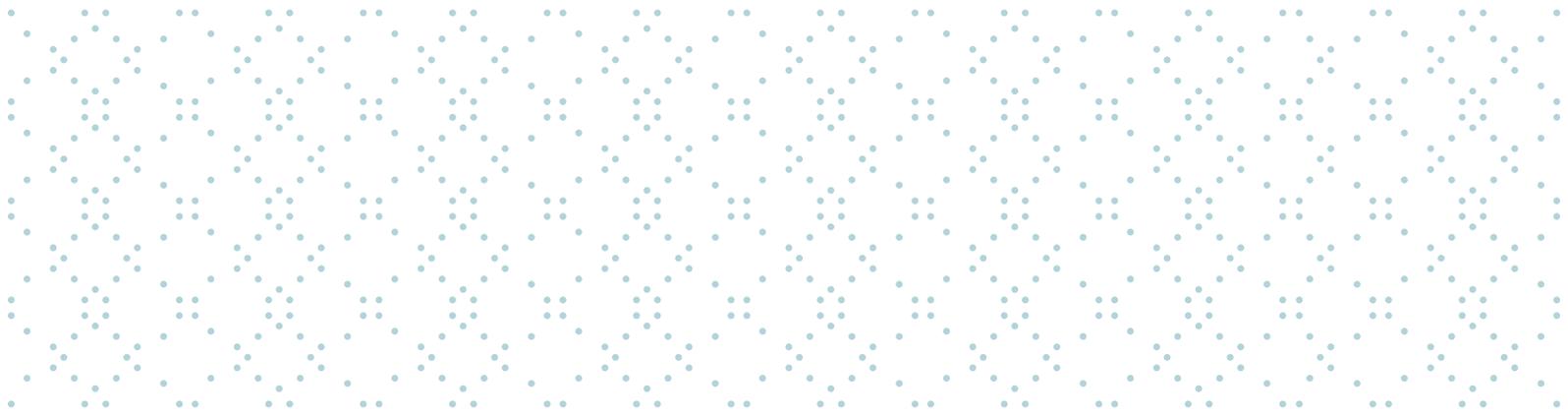
Common knee problems and their clinical presentation



Case based discussions and
update on current treatments

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The Knee Clinic

The Knee Clinic offices are based at the Nuffield Health Tunbridge Wells Hospital. The clinic provides a comprehensive service for the diagnosis, treatment and management of orthopaedic knee conditions, running private Knee and Knee Injury Clinics daily and NHS e-referral Knee Clinics several times each week.

The unit is staffed by Consultant Orthopaedic Surgeons Mr Paul Gibb and Mr Nick Bowman, specialist Knee Surgeons who between them have almost thirty years of Consultant experience in Tunbridge Wells.



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Alternatively please complete the enquiry form on the contact page of our website **kneesurgeryclinic.co.uk**

Please feel free to contact The Knee Clinic at any time if you have any further questions or if you would like to receive advice on the management of your patients.



Mr Paul Gibb

FRCS FRCS (Orth)

Paul Gibb has been a Consultant Orthopaedic Surgeon in Tunbridge Wells for over 20 years. His surgical practice consists entirely of Knee Surgery and he runs regular Knee Clinics and Knee Injury Clinics locally. He is a leading contributor of cases to the UK National Ligament Registry and a regular contributor to the UK Knee Osteotomy and National Joint Registries, undertaking large numbers of knee arthroscopies, anterior cruciate ligament reconstructions, knee replacements and knee osteotomies each year.

Following Consultant appointment he helped develop the Knee and Knee Injury service in Tunbridge Wells, and whilst Clinical Director of Trauma & Orthopaedics for the Maidstone & Tunbridge Wells NHS Trust he oversaw the reconfiguration of Trauma & Orthopaedic services from the old Kent & Sussex and Maidstone General Hospitals into the new build at Pembury.

He left the local NHS Trust in 2017 to develop independent practice at The Knee Clinic, still treating NHS patients at the Nuffield Hospital in Tunbridge Wells and at the Horder Centre in Crowborough via weekly NHS Patient Choice e-referral clinics.

He has published and presented on various topics related to Knee Surgery and remains actively involved in the teaching of Knee Surgery, lecturing at national meetings on Knee Ligament injuries and on Knee Osteotomy. He set up and chairs the South East Knee Study Group, is a member of the British Association for Surgery of the Knee and of the European Society for Sports Traumatology Knee Surgery and Arthroscopy and is also a reviewer for The Knee Journal.

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Mr Nick Bowman

FRCS FRCS (Orth)

Nick Bowman is a graduate of Edinburgh University Medical School and completed his surgical training in London and Charing Cross Hospitals. He also gained international experience working in Australia for 18 months where he specialised in knee arthroscopy, anterior cruciate ligament reconstruction and knee replacement surgery.

Nick was appointed as a Consultant Orthopaedic Surgeon at The Tunbridge Wells Hospital, Pembury in 2013, specialising solely in his chosen sub speciality area of knee surgery where he regularly performs knee joint replacements, ligament reconstructions and arthroscopic procedures on the knee.

He is well published in knee surgery and his work has been presented at prestigious international conferences. He continues to undertake clinical research at The Tunbridge Wells Hospital into anterior cruciate ligament reconstructions in adolescents and in knee replacement surgery.

He is a member of BASK and treasurer of the South East Knee Study Group. Nick teaches on an ACL reconstruction and meniscal repair course and is a reviewer of The Knee Journal.

Clinical scenario

A 15 year old complains of knee pain exacerbated by sporting activity.

Likely diagnosis:	Patellofemoral knee pain
Key questions:	Unilateral or bilateral, relieved by rest /activity modification
Investigations:	Consider MRI if conservative treatment fails or if caution exists
Treatment:	Explanation, activity modification, physiotherapy, McConnell taping and orthotic manipulation
Cautions:	<p>Always examine the hip – restricted or painful internal rotation SCFE</p> <p>Unilateral pain is unusual – MRI</p> <p>Mechanical symptoms ie episodic locking suggest osteochondritis – MRI</p> <p>Sinister symptoms ie night pain could be caused by very rare sinister pathology – MRI</p>



Patellofemoral knee pain

Anterior knee pain usually develops because of pathology developing in the patellofemoral joint. Less commonly it can also arise in any part of the mechanism responsible for straightening the knee against resistance, including the tendons above and below the kneecap, and the bone to which they are attached. In the vast majority of cases symptoms are relatively mild and precipitated by certain types of exercise, particularly exercise involving lunging or stepping.

Patellofemoral pain associated with chondromalacia patellae is more common in young women approaching and soon after menarche. Symptoms are almost always bilateral and reliably exacerbated by activity, particularly sporting activity and training. Osgood Schlatters disease (apophysitis of the tibial tuberosity physis) is more common in young men and usually associated with tender swelling of the tibial tuberosity. Symptoms are usually associated with sporting activity and relieved by rest.

Treatment usually consists of activity modification, specific patellofemoral physiotherapy (sometimes including the use of tape applied to the skin around the knee), and in selected cases the use of contoured orthotic insoles. Surgical treatment is rarely required.

Unilateral pain is unusual and should be investigated by MRI. Mechanical unilateral symptoms including episodic locking could suggest the presence of an osteochondritis. Night pain or pain unrelieved by rest could be caused by sinister pathology and should be investigated by MRI.

Very occasionally patients with hip pathology (particularly SCFE) will present complaining only of knee pain and limp. Always examine the hip and document that internal rotation in flexion is full and pain free.

Notes...

Clinical scenario

A 20 year old injured his knee playing football describing a painful twist as he changed direction and during which his knee gave way. He was unable to continue.

Likely diagnosis:	ACL rupture
Key questions:	Painful pop or crunch
	Loss of function
	Rapid onset swelling and stiffness
	Haemarthrosis 75% ACL rupture, 15% massive meniscal tear, 10% fracture
Investigations:	Urgent X-ray if unable to WB otherwise MRI (all knees swelling after injury)
Treatment:	RICE and physiotherapy
Cautions:	ACL rupture is commonly missed on first pass through A&E
	Massive traumatic meniscal tears may be repairable
	Occult fracture
	'Locked knee' likely massive and possibly repairable displaced meniscal tear
Referral:	Urgent Knee or Knee Injury Clinic



Fig 1.
ACL rupture and subluxation bone bruise.



Fig 2.
Massive meniscal tear.



Fig 3.
Reconstructed ACL.

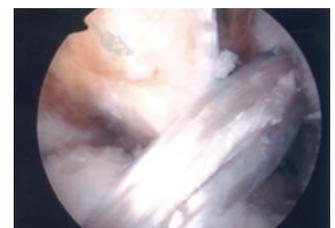


Fig 4.
Reconstructed ACL.

Anterior cruciate ligament injuries and reconstruction

The anterior cruciate ligament is commonly injured, patients usually describing a twisting mechanism with painful instability, or a painful back kneeling or hyperextension of the knee. The injury may be associated with a sensation of popping or crunching and is often associated with the rapid subsequent development of swelling and stiffness.

If haemarthrosis develops after injury the diagnosis should always be suspected, and X-rays or an MRI scan arranged before referral for assessment by a senior physiotherapist or knee surgeon. Post traumatic haemarthrosis is associated with ACL rupture in 75% of cases, with repairable traumatic meniscal tear in 15% of cases and with occult fracture in 10% of cases.

The treatment of anterior cruciate ligament injuries has advanced considerably during the last decade and should surgical treatment be required it is now performed arthroscopically using techniques that facilitate accelerated rehabilitation. Injuries to the menisci or condyles are treated simultaneously.

The anterior cruciate ligament is usually reconstructed using hamstring tendons harvested from the injured leg. These tendons are used to fashion a new cruciate ligament which is fixed securely into bone tunnels created during the surgery. Hamstring tendon harvested from the patient's own body is called hamstring tendon autograft, but occasionally other tendons or grafts are used,

including hamstring harvested from the un-injured leg, patella tendon, and tendons transplanted from cadavers (known as allograft). Occasionally and only if the injured knee is very unstable an additional reinforcing strap is also added on the outer side of the joint (LeMaire lateral extra-articular tenodesis).

Following simple ACL reconstruction patients are mobilised weight bearing using 2 crutches, full weight bearing without aids as soon as they establish leg control. Physiotherapy plays an important role in rehabilitation with early goals including the recovery of full extension. Return to competitive sport is usually delayed for between 6 and 9 months, all patients following an accelerated rehabilitation program.

Further information regarding ACL injuries can be found at kneesurgeryclinic.co.uk

Notes...

Clinical scenario

A 30 year old complains of swelling, stiffness and pain after playing sport. 10 years ago they underwent ACL reconstruction and meniscectomy rehabilitating successfully and returning to competitive sporting activity.

Likely diagnosis:	Post traumatic chondral and meniscal pathology
Key questions:	Generalised swelling (effusion) suggests chondral pathology
Investigations:	MRI identifies evolving chondral and meniscal pathology
	Long standing films formally asses alignment ie varus/valgus
Treatment:	Activity modification, RICE, physiotherapy
	Chondral and meniscal preservation
	Consider osteotomy in presence of deformity
Cautions:	Activity modification to prevent progressive damage
Referral:	Failed conservative treatment
	Symptoms >3/12 duration
	Patient willing to consider surgical treatment



Fig 1.
Chondral defect.

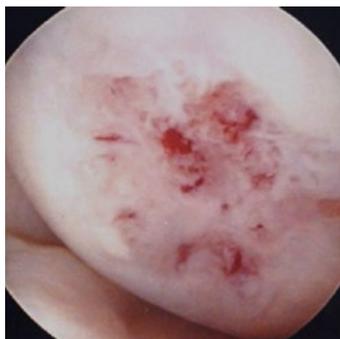


Fig 2.
Microfracture.

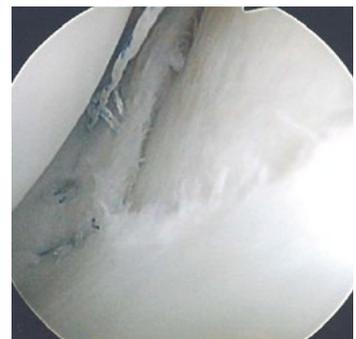


Fig 3.
Meniscal suture.

Chondral defects in young adults

Swelling, stiffness and pain are symptoms associated with evolving chondral pathology and are being seen in an increasing number of young active sportsmen who have sustained knee injuries or undergone knee surgery in the past. These young active patients are extremely resistant to advice on activity modification and have usually played competitive sport at a high level for many years.

Microfracture is one of several techniques used to stimulate the healing of discrete defects in chondral cartilage usually occurring in the weight bearing areas of the knee. It is suitable only for smaller defects, and most particularly for those surrounded by relatively healthy chondral cartilage. The technique is performed arthroscopically (usually on a day case basis) and involves the formation of small holes in the base of the defect through which marrow and blood cells can pass, bringing with them the potential for healing. Following microfracture pastes or gels containing chondrocytes and growth factors can also be placed into the defect and covered with a fine membrane stitched or glued into place.

The principle disadvantage of microfracture is that, following surgery, a period of protected weight bearing is required using two crutches, and often of several weeks duration. Healing of defects treated in this way is usually assessed by the clinical resolution of

symptoms and also by repeat MRI scanning. Relief of symptoms following microfracture is usually only appreciated by patients three to four months following surgery. When cartilage defects of this type are associated with varus or valgus deformity, microfracture is occasionally performed in association with knee osteotomy. Meniscal failure following injury and surgery results in abnormally high stress and loading of chondral cartilage. Meniscal replacement or transplant is a technique now being performed arthroscopically in young active patients who are symptomatic and have radiological evidence of evolving chondral pathology. If co-existing varus or valgus deformity has been identified osteotomy can also reduce this abnormal loading and delay the onset of posttraumatic osteoarthritis.



Fig 4.
Varus knee deformity.

Notes...

Clinical scenario

A 40 year old became aware of knee pain after playing tennis. Pain is well localised to the medial side of the joint, has persisted since and is associated with clicking and catching.

Likely diagnosis:	Degenerate meniscal tear
Key questions:	Where is the pain? – often localised with fingertip. Symptoms are often very variable in severity. Mechanical symptoms ie clicking, catching, transient painful locking and episodic painful pseudo instability suggest meniscal tear
	Physical signs consistent with meniscal tear – local tenderness, McMurray test
Investigations:	MRI confirms meniscal tear and excludes OA
Treatment:	Simple analgesics and NSAID tablets and gels, physiotherapy
Cautions:	Chondral pathology is more often associated with swelling
Referral:	Urgent if knee is 'locked'
	Failed conservative treatment
	Symptoms >6/52 duration in the absence of OA
	Patient willing to consider surgical treatment

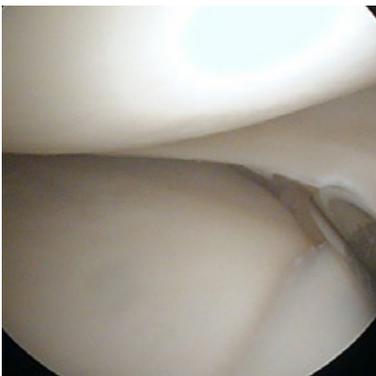


Fig 1.
Normal meniscus.

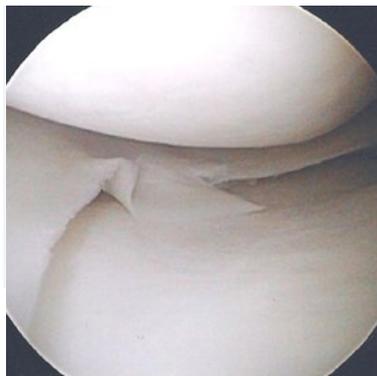


Fig 2.
Torn meniscus.

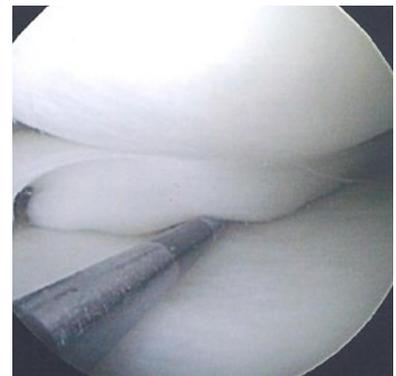


Fig 3.
Torn meniscus.

Degenerate meniscal tears

Meniscal tears are a very common cause of knee pain, transient locking, catching, clicking and occasional feelings of painful giving way.

The majority of meniscal tears occur in adults and develop in areas of pre-existing or developing weakness. Small fissures appear at the surface of the meniscus and these are worked and kneaded by the action of the knee, gradually progressing in length until they begin to produce symptoms, usually when a part of the meniscus begins moving independently and begins snagging or catching under the knuckles of the joint. Symptoms may develop insidiously and characteristically vary in severity with periods of relative relief interspersed with periods when the knee is symptomatic. Pain associated with meniscal pathology is usually well localised to the medial or lateral tibiofemoral compartments. The diagnosis is usually confirmed by medical imaging, and particularly by MRI scanning. If symptoms associated with meniscal tears fail to settle with simple conservative treatment arthroscopic investigation and treatment may be required.

Arthroscopic meniscectomy is the most commonly performed of all arthroscopic operations and normally involves removal of the torn piece of cartilage only, sparing as much normal cartilage as possible and contouring the

cut edges to ensure that the knee runs smoothly following surgery. Arthroscopy is not a particularly painful procedure, all patients are given painkillers to take home and most patients use these painkillers on the first day or two following surgery. Thereafter, they are not usually required.

Further information regarding meniscectomy can be found at kneesurgeryclinic.co.uk

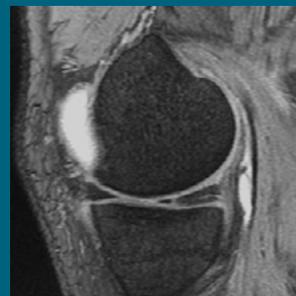


Fig 4.
Torn meniscus.



Fig 5.
Meniscal tear.

Notes...

Clinical scenario

A 50 year old complains of anteromedial pain and swelling after jogging or walking on uneven ground and is no longer able to run or to play competitive hockey. 15 years ago he underwent arthroscopic meniscectomy.

Likely diagnosis:	Post traumatic osteoarthritis possibly associated with meniscal tear
Key questions:	Analgesic use, degree of functional disability, night pain and sleep disturbance
	Is varus (bow leg) or valgus (knock knee) deformity visible?
	Does the patient feel that their symptoms are significant enough to warrant surgical intervention?
Investigations:	Plain X-rays Standing AP, Schuss, Lateral may reveal joint space loss
	MRI often reveals associated degenerate meniscal tear and OA
Treatment:	Activity modification
	Weight loss and exercise, simple analgesics and anti-inflammatory tablets and gels, physiotherapy
	'Unloader' braces can be useful in these patients
	Joint preservation surgery
Cautions:	Referred pain particularly from the hip – X-ray if in doubt
Referral:	Symptoms >3/12 duration
	Failed conservative treatment
	Patient willing to consider surgical treatment



Fig 1.
Varus deformity and tibial osteotomy.



Fig 2.
Valgus deformity and femoral osteotomy.

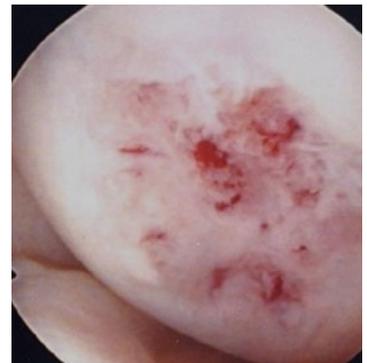


Fig 3.
Microfracture.

Treatment of evolving arthritis in active middle aged patients

Arthritis involving only one compartment of the knee and associated with varus (bow leg) or valgus (knock knee) deformity may be treated by osteotomy, an operation which allows preservation of the natural knee joint and so avoids the problems associated with the performance of knee replacement in younger patients.

Osteotomy is most suited to younger and more active patients and is particularly useful for those patients who wish to continue participating in sporting activity.

The operation involves making controlled cuts in the bones above, or more usually below the knee, and using these controlled cuts to slightly over-correct the varus (bow leg) or valgus (knock knee) deformity associated with localised arthritis. Once the desired correction has been achieved, the osteotomy is fixed with a strong but lightweight plate and screws. Correcting the alignment of the leg in this way reduces pressure on the arthritic compartment of the knee and can significantly delay the progression of arthritis. Osteotomy can be used in conjunction with other techniques to stimulate the healing of cartilage defects and can also be combined with ligament reconstruction. Osteotomy is a major operation and following it a short period of weight bearing using two crutches is required, which may be of several weeks duration.

The principle advantage of osteotomy is that it preserves the patients own knee joint, thus delaying the need for a knee replacement usually for between eight and ten years. Risks associated with osteotomy are similar to those associated with knee replacement and also include delayed union at the site of the osteotomy.

Both Mr Gibb and Mr Bowman regularly undertake knee osteotomy and have visited leading centres of expertise in Europe.

Further information on Knee Osteotomy can be found at kneesurgeryclinic.co.uk and a more detailed description of Knee Osteotomy, including information on the advantages and disadvantages of osteotomy vs knee replacement, can be found at the Osteotomy Expert Group website: osteotomyexpertgroup.com

Notes...

Clinical scenario

A 65 year old has a several months history of increasingly significant knee pain now associated with swelling, stiffness and limp.

Likely diagnosis:	Osteoarthritis
Key questions:	Analgesic use, degree of functional disability, night pain and sleep disturbance
	Does the patient feel that their symptoms are significant enough to warrant major surgical intervention?
Investigations:	Plain X-rays Standing AP, Schuss, Lateral
Treatment:	Weight loss and exercise, simple analgesics and anti-inflammatory tablets and gels, physiotherapy if available, some find strapping or knee sleeves useful
	Some patients may benefit from injection (avoid injection if referring for TKR) – those with effusion and synovitis aspirate and steroid injection – hyaluronic acid
	Joint replacement
Cautions:	Referred pain particularly from the hip – X-ray if in doubt. Some forms of inflammatory arthritis can progress rapidly with deformity.
Referral:	Symptoms >3/12 duration
	Failed conservative treatment
	Patient willing to consider surgical treatment



Fig 1.
Knee osteoarthritis.



Fig 2.
Knee osteoarthritis.



Fig 3.
Knee replacement.



Fig 4.
Knee replacement.

Knee osteoarthritis and knee replacement

In the majority of elderly patients knee osteoarthritis is tri-compartmental and this type of arthritis is the commonest indication for total knee replacement. Well over 100,000 knee replacements are performed annually in the United Kingdom and between them Mr Gibb and Mr Bowman perform around 400 knee replacements each year.

The operation is one of the most durable and successful of joint replacements and although the knee joint is a more complex joint than the hip, knee replacements are now as safe as and as reliable as hip replacements. A variety of different types of knee replacement are available but the most commonly performed, cemented total condylar or total knee replacement, has a clinical survivorship of over 95% at 10 years.

Pain is the principle indication for knee replacement, and the operation reliably relieves pain in the vast majority of patients. This pain relief is principally responsible for the relief of disability commonly experienced by patients with knee arthritis, allowing them to resume most normal activities, including recreational and some social sporting activity. Knee replacement is a very successful operation, over 90% of patients reporting relief of pain and around 80% reporting the results as good or excellent. Recovery is however measured in months rather than weeks with improvement usually continuing for at least 12 months following surgery.

Common complications include stiffness and aching discomfort. Serious complications include infection and venous thromboembolism. Mortality following surgery is low at around 1:1000.

National Joint Registries demonstrate that the most durable knee replacements are cemented total condylar in type and the vast majority of knee replacements performed are of this variety. Uni-compartmental or partial knee replacement is performed in selected cases when arthritis is confined to a single compartment of the knee.

Further information regarding the procedure and the aftercare can be found at kneesurgeryclinic.co.uk

Notes...

Robotic-assisted knee replacement

Nuffield Health Tunbridge Wells have introduced NAVIO™ robotic technology for knee replacements.

Knee replacement involves the precise fitting of appropriately sized implants into the knee with good soft tissue balance and true limb alignment. Conventional surgery is planned using X-rays. During the operation measurements are taken from the bones of the knee and mechanical jigs are used to make adjustments to the fit and trim of the knee replacement components with the aim of optimising function. The required skills to do this are developed by surgeons over years of experience and although every knee joint is different a reproducible technique seems to be associated with better outcomes.

Using computer navigation during knee replacement surgery facilitates a much more precise measurement of the existing diseased joint surfaces and involves the creation of a computer generated virtual knee model. This model then facilitates very accurate planning of the joint replacement fit and alignment. Small changes can be made to a virtual knee replacement and their effect upon soft tissue balance and flexibility assessed as the knee replacement surgery is being performed. Once the virtual model has been made and the virtual replacement planned the bone is then cut and trimmed with the assistance of a robotic tool which exactly recreates the computer generated model. This technique provides a degree of accuracy far greater than can be achieved using conventional methods.

Studies have already confirmed that computer navigation and robotic assistance improves the accuracy of knee replacement and may improve early functional results. This improved accuracy should result in less eccentric wear of the knee replacement components over long years of use and improve the longevity of implants particularly when they are used in younger and more active patients. Studies involving many thousands of patients with follow up of many years duration will be required to demonstrate true advantage in longevity but it seems entirely reasonable to expect that there will be one.

Although computer navigation robotic assistance will never replace the art of surgery or the skills accumulated by an experienced surgeon it does seem likely to result in a more reproducible technique, more accurate implant positioning and some improvement in early functional outcome. For these reasons robotic knee replacement has now been introduced in a number of vanguard units in the United Kingdom, of which the Nuffield Hospital in Tunbridge Wells is one. Our first robotic knee replacement was performed in May and robotic knee replacement is now regularly being performed.

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If you require further information on knee replacement in general or robotic assisted knee replacement in particular please do not hesitate to contact:

The Knee Clinic in the Nuffield Hospital on **01892 546111** or the Nuffield Health directly on **01892 531111**.







Useful sources of information

The Knee Clinic

kneesurgeryclinic.co.uk

Private Healthcare Information Network (PHIN)

phin.org.uk

The National Joint Registry (NJR)

njrcentre.org.uk

UK National Ligament Registry (UKNLR)

uknlr.co.uk

UK Knee Osteotomy Registry (UKKOR)

ukkor.co.uk

Nuffield Health

nuffieldhealth.com

The Knee Clinic contact details

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