National Clinical Strategy for Orthopaedics (NCSOS) Report 2e - Guidelines and Recommendations Knee Surgery

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1. Executive Summary

Knee Surgery is the highest volume Orthopaedic subspecialty with numerous procedures and pathways, involving quite varied diagnostics, surgical techniques and patient group demographics. E.g. Patellofemoral instability, revision knee Arthroplasty.

There are existing national and specialist society best practice pathway guidelines that are not integrated uniformly across Wales. This document provides recommendations on how these pathways and guidelines can be developed into integrated clinical pathways and how further pathways can be developed where gaps and need exist; combining these recommendations with the other Orthopaedic subspecialties will lead to transformative pathway re-design. It is complemented by the NCSOS report 2a – *"General Strategic Pathway Recommendations"* and will feed into the NCSOS final report 3 *"The National Blueprint for Orthopaedic Surgical Delivery".*

A significant number of the action points and recommendations in this document require HB level intervention and accountability and are well within limits of feasibility. Other actions need central intervention and can only be led clinically, through the development of a National Knee Clinical Reference Group (NKCRG) working within the governance structure of a fully resourced Welsh Orthopaedic Network (W.O.N) with authority to implement and deliver change at scale. The NFACRG and W.O.N will be discussed further in NCSOS report 3.

The whole knee pathway is considered within this document. It requires transformative change in parts to deliver a seamless journey for the patient. Allied health staff, in particular specialist knee physiotherapists are key to this. This staffing group should be integrated within all stages of the pathway from primary care through triage to secondary and tertiary care clinics. This will reduce variation, improve quality and reduce adverse outcomes.

Secondary and tertiary infrastructure requires urgent attention. Achieving estates standards in all HB's for OPD services such as rooms for allied health professionals and to allow dual consultant clinics is the bare minimum; we should be striving for far more for our patients and developing gold standard and innovative pathways at scale on a national level via the NKCRG and W.O.N.

Knee surgery is evenly split between an inpatient and daycase setting, the former requires an elective ring fenced unit with fully trained theatre staff, laminar flow theatres and full range of implants. These units should be specified for HVLC processes and encourage same day admission and discharge. Alongside this is a need for suitably resourced day case units in all HB's as part of a day case network. There are a small proportion of specialised lower volume knee procedures that have a more complex pathway that require a regional approach. This will be

discussed further in NCSOS report 3 following a full consultant workforce and demand capacity review.

2. Background

The delivery of orthopaedics has been challenging in Wales for decades. The National GiRFT (Getting it Right First Time) review of services was commissioned in 2014 by Welsh Government ahead of the formation of the National Planned Care Programme and the Welsh Orthopaedics Board. However, the recommendations made by GiRFT and supported by clinicians to provide dedicated elective Orthopaedic ring fenced beds through the development of cold elective sites within each Health Board, were not implemented. As a result, services continued to be impacted by regular and frequent unscheduled care pressures.

The Pandemic has exposed this failing system and resultant capacity shortfalls within orthopaedics to the fullest. In September 2021, Welsh Government (WG) commissioned the National Clinical Strategy project for Elective Orthopaedics Surgery (NCSOS) with the primary objective of developing a surgically focused redesign and blueprint for the future state of elective Orthopaedic surgery delivery in Wales, unconstrained by Health Board (HB) boundaries. Alongside this, GiRFT were commissioned to undertake a parallel review in co-ordination with the NCSOS project to provide recommendations for recovery and redesign of services in the short term. It should be noted that Paediatric Orthopaedics and Spinal Surgery services are being considered separately as part of the WHSSC programme of commissioning.

At the outset of the NCSOS project, it was clear that its scope needed to include review of the whole pathways of care feeding into the surgical services. Reviewing surgical delivery alone would not enable the comprehensive transformation required to provide the scale of change needed to deliver high quality and sustainable Orthopaedic care for the population of Wales. This is especially pertinent for Knee Surgery which has numerous pathways of care and interdependencies.

The NCSOS team have therefore developed a suite of reports to cover the work that has been undertaken within the project:

NCSOS Report 1 – *"Orthopaedic Recovery, Urgent - For Immediate Action"*. As part of the project processes, many critical and major risks were identified that needed immediate response, outside of the scope of the strategic role of the NCSOS. At the request of clinicians across Wales, the NCSOS team agreed to provide this interim auxiliary report.

NCSOS Report 3 – *"The National Blueprint for Orthopaedic Surgical Delivery in Wales"* will be published and submitted to WG and Health Board Executive teams in April 2022. This will provide a detailed set of recommendations required to redesign orthopaedic surgery based on clinical pathways and networks, consultant workforce profile and a comprehensive demand and capacity review. It will articulate the required capacity needed to remove the surgical backlog and provide sustainable services at subspecialty and procedure/ pathway specific level. It will provide options of delivery to inform national capacity planning and investment decision-making.

NCSOS Report 2a-f – *"…Pathway recommendations".* These reports comprise of general recommendations (2a) that relate to the Orthopaedic system as a whole while sub reports (2b-f) will focus on specific sub-speciality requirements. These reports will feed into NCSOS report 3 and form the basis of collaborative national pathway development in conjunction with other professional groups. The aim is to create a standardised pathway framework through which care is provided across Wales, which has the ability to adapt for necessary local and regional considerations.

3. Knee Surgery - Methodology

This document has been developed in conjunction with the National sub-specialty Knee Surgery clinical reference group (NKCRG), and is based on local, regional and national considerations, including WG strategy where relevant, and sub-specialty guidelines on best practice. E.g. Getting It Right First Time (GIRFT), British Association for Surgery of the Knee (BASK).

Section 4 reviews the patient pathway which has been broken down into the ten component parts outlined below, in order to standardise the methodology for all of the orthopaedic sub-specialties.

1) Primary Care
2) Initial Triage
3) Pre-Hospital intervention
4) OPD review
5) Diagnostics
6) Return OPD
7) Listing/ Waiting for Surgery
8) Pre-Assessment
9) Surgery
10) Post-operative

The document details an integrated Knee Surgery pathway, but where necessary, reference is made to the BASK pathology specific guidelines (Annex1) for-

- Meniscal Surgery Guideline 2018
- Best practice management for ACL injuries

In addition, GIRFT guidelines (Annex2) for:

- Total Knee Arthroplasty
- Unicondylar Knee replacement
- ACL reconstruction
- Guidance for clinical and operational practice guidance for patients with hip and knee pain requiring joint replacement surgery

Section 5 details NHS England (NHSE) commissioning classifications of Specialised and Non-specialised Knee surgical procedures. The Knee Surgery CRG has reviewed these distinctions and their clinical applicability for NHSW. The CRG recommended output categories will underpin the data analysis phase feeding into NCSOS report 3.

Section 6 provides an initial workforce review of Knee Surgery consultant level provision in Wales, matched against the specialised and non-specialised procedure

demands nationwide, to allow a consultant sustainability review on horizon scanning.

The key recommendations from the NKCRG are at (Annex5) attached.

4. Identified National pathway issues for Knee surgery

4.1 Primary care

Attempts at conservative treatment must have been made for at least 3-6 months. The exception are patients with acute knee presentations, who should be referred and seen in the local acute knee clinic within two weeks, to exclude serious acute knee pathology such as a ligamental rupture or meniscal tear.

To aid standardisation of service, we recommend multi-disciplinary working, with CMATS/ MCAS, APP's and ESP's with an interest in Knee Surgery being embedded within MSK pathways alongside Knee surgeons, FCP's and GP's as part of an integrated pathway within primary, secondary and tertiary care.

For referrals of Knee Arthritis, where appropriate documentation should be provided to indicate advice and guidance in relation to weight loss (patients with BMI>30, abdominal girth>4cm over chest); information and support for smoking cessation, and recommendation of achieving minimum aerobic exercise of 150 minutes per week.

Refer to NCSOS report 2a for further generic guidance.

Criteria to identify those patients who may benefit from joint preservation techniques e.g. HTO, UKR should be identified by knee CRG so that this information can be included within referrals to assist triage.

Action 1: Trial of non-operative management must have been considered prior to referral with exception for acute knee presentations.

Action 2: All HB's must immediately reinstate/develop Acute knee pathways with fastrack imaging and theatre capacity in line with BASK ACL and meniscal surgery guidelines.

Action 3: Weight bearing plain radiographs of the Knee must be requested prior to referral for suspected Osteoarthritic conditions.

4.2 Initial triage

An MDT triage system including APP's with a specific expertise in management of knee conditions, arthroplasty ANP and subspecialist consultant(s) should be employed by all HB's.

Whilst it is uniformly agreed across all Orthopaedic sub-specialties that initial secondary care consultant should be face to face, there may be circumstances identified at triage stage in rural communities, where patients may be suitable for virtual consultant. E.g. osteoarthritic knee presentations with primary care performed X-rays supporting diagnosis.

Acute knee presentations will be addressed in the interim risk register report. There is a clinically dangerous lack of hot knee clinic and theatre capacity across Wales, which is of high risk of causing irreversible patient harm.

All patients accepted to secondary care should be placed on the National Joint and ligament Registries where appropriate.

Action 4: An MDT triage including APP/AHP soft tissue and Arthroplasty practitioners at early stage of the pathway.

Action 5: All patients accepted to secondary care should be placed on the National Joint and ligament registry where appropriate.

4.3 Pre-hospital intervention

We recommend that CMATS/MCAS practitioners have specific roles in the MDT triage & treatment of knee referrals in line with recommendations made above. This could involve assessment of patients' suitability for knee surgery prior to referral and application of prehabilitation programs.

ACL prevention programmes rolled out into community sports teams for example have been demonstrated to significantly reduce the rate of ACL rupture presentations[1]. We recommend a national APP/ESP led review of these programmes.

Action 6: ACL prevention programmes should be reviewed and developed by APPs/triage and treat services and embedded within community sports teams. This should be clinically governed by an overarching Orthopaedic Network.

4.4 Outpatient Review

There is a strong recommendation from the sub-specialty group that initial outpatient appointment should be provided F2F and recognised as the gold standard. However, as per above section, there may be circumstances identified at triage stage in rural communities where a virtual appointment is deemed appropriate.

It is universally acknowledged that MDT working provides the best patient experience and best outcomes It is therefore recommended that first outpatient should be an MDT clinic. Each HB should provide acute knee, soft tissue elective and Arthroplasty clinics with inclusion of APP/ESP and Arthroplasty ANP support within the appropriate clinics. Consideration should be given wherever possible to promote co-location of consultants into a single HB knee clinic to facilitate MDT working. All HB's must provide acute knee clinics with immediate effect, with fast-track imaging/MRI and acute knee theatre sessions. Acute knee clinics and pathways must adhere to BASK ACL rupture and meniscal injury guidelines.

Action 7: All OPD should be multi-disciplinary to include APP/AHP/knee arthroplasty and soft tissue practitioners alongside sub-specialty consultant.

Action 8: Joint consultant clinics should be employed wherever possible to promote regional knee network MDT.

4.5 Diagnostics

Standardised imaging protocols should be embedded within an interactive integrated MSK pathway with all radiographs completed prior to first outpatient review and performed within six months of OPD review. The sub-specialty group recommend regular interactions between MSK radiology and MSK clinicians within a regular HB or regional MDT. In addition, it is recommended that any arthroplasty MDT must include microbiology support. Regional or possibly national level collaborative infected arthroplasty MDT's need to be considered and governed by an overarching National Orthopaedic network.

All HB's must commission fast track access to MRI and USS for acute knee presentations. This should be in the form of a "one stop shop" acute knee clinic, to improve patient experience and reduce the risk of harm due to delayed diagnosis and subsequent treatment.

Action 9: Microbiological support must be available for all HB and regional MDT.

4.6 Return OPD

It is recommended that the majority of follow-up appointments are virtual where clinically appropriate and that sub-specialty follow up protocols are agreed nationally by the Knee CRG. The majority of follow-ups may be avoided with implementation of MDT working recommended in this document. However, monitoring of performance metrics for virtual clinics must be rolled out nationally. This can be monitored by the existing outpatient programme

There is a national poor adoption of the soft tissue knee registry. This must become embedded in the outpatient pathway and performance nationally monitored through an overarching Orthopaedic network.

All patients should have PROMS/PREMS at all stages of the treatment pathway and be placed on the Knee registry.

Action 10: Virtual long term FUP where applicable with automated imaging and PROMS collection.

Action 11: All patients should be inputted to the appropriate registry.

4.7 Listing/ Waiting for Surgery

Provision of joint schools for all patients listed for joint replacement surgery is a mandatory national requirement. We recommend a national standard of the constituent parts of a joint school, which should be agreed at a national sub-specialty level but implemented and resourced locally. We do not recommend a dogmatic centrally driven format or approach to the delivery of joint schools as to do so would undermine existing successful programs already in place.

A clinical prioritisation tool for knee surgery should be developed as per NCSOS Report 2a generic recommendations. This will require a national work-stream in the Knee sub-specialty CRG.

The Knee CRG should define specific criteria for patients who may benefit from joint preservation techniques such as UKR or osteotomy. Suitable patients should be

offered these techniques at time of clinical review and/or at time of listing and be offered referral to a surgeon who performs joint preservation surgery.

Prehabilitation programmes for soft tissue knee must be in place in all HB's working to a nationally standardised specification but accepting each HB may require variation due to geographical differences. This should be developed further by the national CRG.

Action 12: Sub-specialty CRG to further define minimum volumes for UKR and local and regional networks.

Action 13: NKCRG to develop a clinical tool in collaboration with other CRGs within the W.O.N.

Action 14: Provision of nationally agreed template joint school in each HB.

4.8 Pre-assessment

A significant proportion of soft tissue knee surgery is daycase or overnight stay and potentially through block anaesthesia. All HB's should have a process that identifies patients who may be able to undergo a more streamlined pre-assessment. For Arthroplasty, a significant proportion may be suitable for managing in a HVLC unit.

Action 15: All HB's should develop pre-operative soft tissue knee prehabilitation programmes.

Action 16: Every HB must reinstate PAC with sub-specialty MDT input.

4.9 Surgery

4.9.1 Future state

Non-arthroplasty knee surgery is predominantly daycase, which will require local provision in existing units wherever possible. An Orthopaedic daycase delivery network and its required capacity will be discussed in NCSOS report 3.

Knee arthroplasty surgery is mainly inpatient, which should be provided within a dedicated ring fenced elective facility. The concept of high volume low complexity (HVLC) surgery as a means of ensuring maximum utilisation of theatre lists must be strongly embraced within NHS Wales.

Identifying and developing appropriate infrastructural configuration for patients requiring low volume high complexity (LVHC) surgery is a challenging task. Such facilities will require careful consideration of out of hours medical and surgical supervision as well as the need for provision of monitored beds and/or HDU/PACU provision and transfer arrangements to a level 3 critical care setting. It is unlikely we will return to the prepandemic state of LVHC procedures being performed at very low volume in every acute site. Specific sites will need to be identified to care for these patient cohorts and may be dependent on whether the patient is surgically complex e.g. infected arthroplasty, or surgically straightforward but medically complex. This will be considered within the NCSOS Final Report 3 "*The National Blueprint for Orthopaedic Surgical Delivery in Wales*".

However, there is a requirement for more medically complex beds for some trauma presentations particularly peri-prosthetic fractures[1] with associated orthogeriatric support to be provided within at least one site in each HB. This patient cohort will be high-risk transfers if these services are "over-centralised". This may necessitate clinical networking so that consultants with the appropriate expertise can move with ease between sites to deliver this care.

Therefore, systems that involve a network of such infrastructures will be required, in order to ensure equity of access to all procedures and for all patient groups across Wales. Complex arthroplasty and revision work underpins routine arthroplasty work and a solid foundation for complex arthroplasty service provision is required. It is therefore a key recommendation that appropriate pathways for this cohort must be provided alongside pathways for more routine arthroplasty.

Consideration also needs to be given to the long-term potential for the anticipated increased volume of day case arthroplasty.

4.9.2 Resource requirements

Theatre complexes must be dedicated to orthopaedic surgery and be laminar flow, with a full range of implants, and not reliant on loan kit. Implant utilisation should be critically appraised so that only 10a ODEP rated implants are utilised and wherever possible clinical agreement should be sought to rationalise implant selection.

All surgical procedures should be performed by, or under the supervision of a Consultant FRCS T & O specialising in knee surgery. All inpatients must be cared for by a 24/7 doctor competent in general medical ward care and ability to recognise perioperative medical and surgical complications. Medically complex patients and

those with peri-prosthetic fractures require orthogeriatric or dedicated senior medical supervision and MDT approach to a similar standard to those expected for patients with hip fracture.

Revision knee surgery and low volume joint preservation surgery should be rationalised and regionalised as per GiRFT principles to ensure critical volumes and best outcomes. Consultant level fragilities in some HB's in terms of revision knee arthroplasty should lead to collaboration to provide services on a whole HB level rather than silo working.

Where necessary, HB's should also form regional alliances with neighbouring HB's. Regional "passports" should be developed to allow surgeons to work across sites and HB's.

Action 17: Equitable access to HVLC and LVHC capacity irrespective of HB/Region.

Action 18: Every HB to immediately reinstate daycase facilities for soft tissue knee procedures to allow this patient cohort to be managed as locally as possible.

Action 19: The requirement for laminar flow theatres at procedure specific level should be determined by the Knee CRG.

Action 20: Implant standardisation to 10A rated implants and clinically appropriate rationalisation.

4.10 Post-operative

Inpatient wards must have extended long day and seven-day therapy provision to encourage prompt mobilisation and discharge.

Processes to promote same day discharge must be provided, including a regionalised out-reach service for post-operative pain and mobility management.

There must be clear criteria in place to facilitate nurse led discharge.

Day units must be provided with working hours of all staff to ensure DOSA and same day discharge.

Regional post-operative support networks are required to facilitate same day arthroplasty processes.

Action 21: All HB's must have seven-day physiotherapy in place.

5 Specialised, non-specialised and procedure specific considerations

The NHSE specialised prescriber manual was reviewed by the Knee Surgery CRG. It was recognised that whilst the terminology may be applicable for commissioning within the NHSE framework (and in turn may be of relevance if NHSW commissioning evolves), it is not fully usable for clinical strategic planning.

The consensus of the CRG is that most knee procedures are *subspecialist*, including those that are categorised as non-*specialised*, and therefore should be performed by an Orthopaedic Surgeon with dedicated knee training. This will comprise of recognised knee fellowship training for prospective appointments, but recognising and respecting that in the current state, there are highly trained and experienced surgeons with a knee subspecialist interest who have not had formal fellowship training but who form an integral part of the national knee Network.

The procedures beyond the commissioning terms appear to have fallen into three potential baskets.

a) Procedures that should be performed by all knee surgeons and units.
b) Procedures that may need to be provided through local surgeon networks so that they can be delivered in all HB's.
c) Procedures that may need regional network collaboration, regional delivery units or both.

The table below sets out how this can be delivered for knee surgery.

Delivery model	Procedure/ Pathway
All knee surgeons locally	• knee arthroscopy • primary knee arthroplasty
HB network/ MDT	• primary soft tissue knee • UKR • Osteotomy • Revision UKR to TKR • Complex primary TKR • Patellofemoral reconstruction
Regional	• complex ligamentous reconstruction • Revision knee

	• Revision osteotomy • Trochleoplasty
Other (requires supra regional approach)	• Meniscal allograft • Acute Complex post traumatic reconstruction for multi-ligamentous knee injury +/- neuro vascular injury

Table 2. Knee CRG Procedure Analysis

Further detail on the outcome of the CRG analysis by procedure can be found at (Annex3) attached.

Action 22: Sub-specialty CRG to further define minimum volumes and required local and regional networks required for Trochleoplasty and UKR procedures.

Action 23: The Hip and Knee CRGs to collaborate and develop national same-day arthroplasty pathways utilising existing best practice already functioning in some HB's (BCU&CTM).

5.1 Network Considerations

A formalised knee network requires several different elements encompassing an agreed MDT structure which would include allocated DCC within job plans and administrative support. Three MDTs are recommended below -

(i). Soft tissue knee/joint preservation network and CRG to formulate referral criteria, minimum datasets, imaging reporting requirements, MDT triage at an early stage of pathway to reduce inefficient referral pathways and agreement on minimal volumes per surgeon for low volume procedures. SW and NW network which would meet at MDT monthly with a national MDT annually.

(ii). Complex arthroplasty to include infected revision arthroplasty based on work already undertaken by BASK. Formation of 2 revision hubs in SW (East and West) and single revision hub in NW with surgeons from different HB's working within each hub in SW and working collectively in NW; will require consultant passport/contractual arrangements and dual consultant operating to be in place. Monthly complex arthroplasty MDT with microbiology support at each hub. Annual national MDT with review of outcomes and KPI's.

(iii). Routine arthroplasty planning and review sessions to occur weekly in each unit. All planned cases and all post op x-rays to be reviewed. Complex cases to be discussed in regional MDT.

It is recognised that some clinicians may be part of multiple MDTs. In order not to overwhelm job plans, it is recommended that all subspecialty CRGs, working within a National Orthopaedic network, define service specifications for the required MDT and TOR to ensure maximal quality and efficiency/ performance.

Action 24: Regional networks to be developed for revision/infection/complex arthroplasty.

Action 25: All Wales best practice Knee pathways as determined by CRG should be embedded nationally.

6 Consultant Workforce Review

There are currently 182 Consultant Surgeons working within Orthopaedic Directorates in Wales. Within this, there are 81 who have a declared subspecialist interest in Knee surgery. 58 are combined hip and knee surgeons, the remaining 23 are specifically knee.

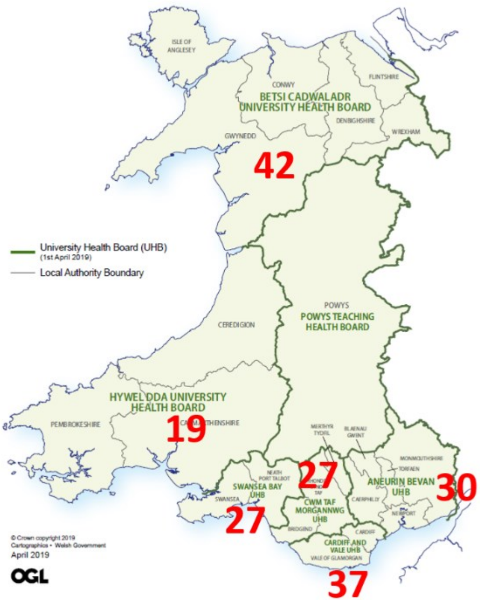

Fig. 1. Distribution of Orthopaedic Surgeons in Wales. (inc spines/paeds/trauma)

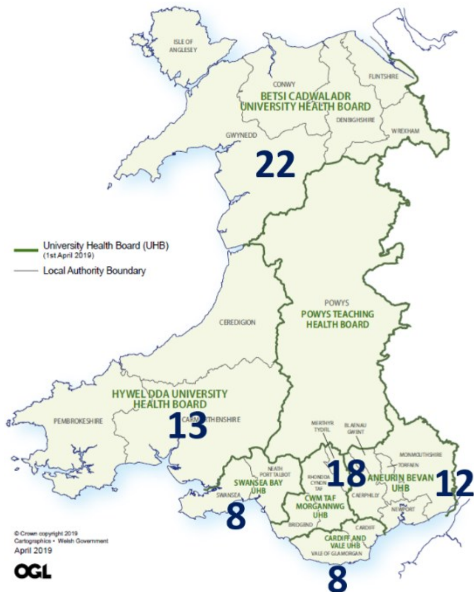

Fig.2. Distribution of Knee Surgeons in Wales.

Fig 1 and 2 illustrate the national orthopaedic surgeons and knee surgeons establishment, respectively, (Note that some Surgeons have more than one subspecialist interest hence this data is only reflective of available consultant skill set, not available time.)

A trainee survey is being conducted to horizon scan for future Knee surgeons with an interest in working in NHS Wales. The output of this survey is included in the final report.

The table below demonstrates the number of surgeons per 100,000 population, together with number of knee surgeons the same, for each HB. The table also includes a 5 and 10-year horizon scan, taking into consideration potential retirements.

HB	Orthopaedic surgeon per 100,000 population	Knee Surgeon per 100,000 population	0-5 yrs horizon scanning	5-10 yrs horizon scanning
AB	5.0	2.0	1.8	1.7
BC	6.0	3.1	3.0	2.3
CAV	7.3	1.6	1.2	1.2
CTM	6.0	4.0	3.8	3.3
HD	4.9	3.3	3.1	2.6
SB	6.9	2.0	2.0	1.8

Table 3. No of orthopaedic surgeons per 100,000 population

7 Conclusion

This document represents the collaborative work of all the knee specialists in Wales, aggregated with existing UK guidance, to produce the best practice sub-specialist clinical pathways considered through the lens of the needs of the patient population throughout Wales.

The greatest concern however relates to the extraordinarily long Orthopaedic surgical waiting lists in NHSW that are increasingly causing patient harm, disability and massive healthcare inequality compared with patients residing in England[1]. Whilst difficult to evidence, many patients with arthritic knee pathology have deteriorated to such an extent that the progression of their condition and associated deformity requires much more complex surgery with significant additional risk of harm. Young adult patients with cartilage and ligament injuries are enduring delays with risk of secondary injuries, in addition to wider socio-economic and mental health impacts.

In producing sub-specialty level pathways collaboratively with surgical colleagues across Wales, it is hoped that these can be implemented as part of a multidisciplinary, national approach to transform musculoskeletal services and ensure appropriate and evidence based utilisation of clinical resources and thus improve patient care. This will require a fully resourced MSK network embedded with the NHS executive structure and in line with the National Clinical Framework.

Triage and referral processes must be able to identify those patients who may benefit from joint preservation techniques such as UKR and osteotomy, enabling the appropriately trained surgeons to review these patients early in the pathway.

High volume day case knee surgery must be provided at HB level as per "*A Healthier Wales*" principles, however low volume specialised day case knee surgery requires a more regional and occasionally supra-regional approach for some presentations.

Primary knee Arthroplasty surgery lends itself to HVLC concepts and these pathways must be adopted within Wales to maximise efficiency and reduce variation in standards of care. This will require a network of cold elective orthopaedic sites. However, a safe level of provision within each HB for LVHC patient groups must be part of this delivery network. This will require utilising a combination of elective cold and acute site infrastructure to ensure essential interdependencies are available. This will be defined in the NCSOS final report 3 "*The National Blueprint for the delivery of Orthopaedic Surgery in Wales*".

Each HVLC unit should aim to deliver a significant proportion of primary arthroplasty with intended same day discharge. Whilst there is a national push championed by GiRFT for same day discharge rates, it is recognised that in Wales there are geographical challenges that will lead to regional variation, however interventions to reduced length of stay must be implemented nationally.

It is required that the recommendations of this subspecialty report be integrated with the other subspecialty CRG recommendations and implemented as part of a national approach to transform musculoskeletal services to deliver high quality patient care adhering to prudent and Value Based healthcare principles.

8 Summary Key Actions Knee (Annex5)

9 Acknowledgements

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10. Appendices

Annex 1 **BASK guidelines**	BASK-Meniscal-Surgery-Guideline-2018.p
Annex 2 **GiRFT guidelines**	GIRFT ACL.pdf GIRFT TKR.pdf GIRFT UKR.pdf
Annex 3 **Knee CRG procedure Analysis**	Annex 3 Knee CRG Procedure Analysis.c
Annex 4 **BOA Guidelines**	Investigation-and-Management-of-Pat Investigation-and-Management-of-Pro Revision-Total-Knee-Replacement-Surgi
Annex 5 **Knee CRG Key Actions**	NCSOS Report 2e Annex 5 Summary Ke

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