



EDITORIAL BOARD

Honorary Advisor:

Prof. Chak-sing LAU

Chief Editors:

Prof. Cecilia Wai-ping LI TSANG

Dr. Iris Yan-ki TANG

Co-editors:

Dr. Steve Man-hong CHEUNG

Ms. Joyce King-yea CHOI

Dr. Oliver Chun-ho MA

Dr. Helen Hoi-lun TSANG

Ms. Lavinia Kit-yea WONG

Dr. Alice Ka-huen YIP

Contributing Writers:

Dr. Ka-ho YEUNG

Dr. Lydia TAM

Ms. Chris Hong-yuen CHOW

Ms. Kathy Oi-ling AU

Mr. David Chi-ho LAU

Dr. Ka-kit TSANG

劉達康醫師

Secretaries:

Ms. Nicole LEUNG

Ms. Charlotte LEUNG

EDITOR'S MESSAGE

Osteoarthritis (OA) is the most prevalent joint condition globally, with the knee being the most affected site. It is estimated that 7.6% of the global population is affected by OA, a twofold increase since 1990^[1]. OA ranks seventh among all causes of years lived with disability in people aged 70 years and above. With an aging population, OA represents a significant health challenge in Hong Kong. Therefore, we have dedicated this issue of the CHARM newsletter to lower-limb OA, bringing together multidisciplinary perspectives to share practical approaches to its management.

OA is more than merely a “wear-and-tear” process; it involves cartilage degeneration and erosion, subchondral bone remodelling with osteophyte formation, and chronic synovial inflammation. Older age, obesity, female sex, prior joint injury or deformity, repeated joint stress, and diabetes can increase the risk of OA, with obesity being an important modifiable risk factor. Patients with rheumatic diseases, such as rheumatoid arthritis, are also at higher risk of OA. Patients with OA often present with joint pain, stiffness, instability, and reduced mobility. There is no effective disease-modifying treatment to alter the pathological progression of OA. A multidisciplinary approach is essential to improve symptoms and function while making informed decisions about surgery when needed. In this issue, alongside insights from two rheumatologists who recently completed overseas musculoskeletal ultrasound training, we have invited experts in physiotherapy, occupational therapy, traditional Chinese medicine, and nursing to share practical perspectives on knee OA care before and after joint replacement.

Reference:

1. GBD 2021 Osteoarthritis Collaborators. Global, regional, and national burden of osteoarthritis, 1990-2020 and projections to 2050: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet Rheumatol.* 2023;5(9):e508-e522. Published 2023 Aug 21. doi:10.1016/S2665-9913(23)00163-7.

Short note on the scholarship funding

HKSR/HKARF Scholarship 2026-2027

The Hong Kong Arthritis and Rheumatism Foundation (HKARF) and the Hong Kong Society of Rheumatology (HKSR) has set up a scholarship to provide financial support to full time Hong Kong doctors/trainees/ fellows in rheumatology who plan to receive specialty training in overseas, to develop special skills or novel diagnostic/ therapeutic modalities.

The amount of grant available is as follows:

3-months' training- HK\$30,000 (lump-sum)

6-months' training- HK\$60,000 (lump-sum)

Coverage: lump sum subsidy including costs of airfare and accommodation.

Deadline for submission: 30 June 2026

Hong Kong Arthritis and Rheumatism Foundation Research Grant

The Hong Kong Arthritis and Rheumatism Foundation (HKARF) is inviting applications to support Hong Kong based doctors/ healthcare professionals/ scientists involved in the management/ study of patients with chronic arthritis and rheumatic disorders, to conduct research studies to provide new insights for the care of patients with arthritis.

The annual budget for the research grant is HK\$100,000 to support a maximum of two research projects. Applicants should prepare a research proposal describing the research aim/objectives, methodology and an estimated budget with breakdowns of expenses.

Deadline for submission: 30th June 2026

APLAR Congress Grant

The Hong Kong Arthritis and Rheumatism Foundation (HKARF) is inviting applications to full time professionals working in the field of rheumatology to support their attendance for the APLAR Congress to enhance their insight into the better understanding and management of rheumatic diseases.

Priority will be given to those who have oral, or poster presentations accepted by the conference. A maximum of 4 scholarships will be funded per year (\$10,000 per person). The 2026 APLAR Congress will be held in Seoul, Korea from 28 October 2026 to 1 November 2026.

Applications should be submitted during the submission period from 1st April to 30th June 2026.



For more details
Please visit our website
www.hkarf.org

MUSCULOSKELETAL ULTRASONOGRAPHY IN KNEE OSTEOARTHRITIS

Dr. Ka-ho YEUNG

Resident Specialist, Caritas Medical Centre, HA

Introduction:

Osteoarthritis (OA) is a prevalent degenerative joint disorder characterized by cartilage loss, bone remodeling, osteophyte formation, and synovial inflammation, leading to pain, stiffness, swelling, functional limitations and physical disability. OA typically affects the hands, knees, and hips and exhibits higher prevalence among older adults and women. Risk factors for knee OA progression include age, generalised OA, and a higher body mass index (BMI). Diagnosis is typically based on clinical history and physical examination, and imaging is not always required. Currently, there are no licensed disease-modifying OA drugs. Sometimes, conventional radiography (X-ray) is performed to confirm the structural changes and to monitor progression. However, plain radiography lacks sensitivity for detecting early soft tissue changes and inflammation, which are integral to OA pathology. Radiographic severity often correlates poorly with clinical symptoms. Magnetic Resonance Imaging (MRI) offers more detailed visualisation of soft tissue and bone abnormalities but is limited by cost and availability. The role of MRI in routine OA care remains unclear.

In contrast, ultrasonography (US) has emerged as a valuable imaging modality, providing real-time visualisation of structural and inflammatory changes in OA, with high sensitivity in superficial joints such as the knees. Compared with clinical examination alone, US demonstrates superior sensitivity. US is portable, inexpensive and free of radiation. Furthermore, real-time US guidance improves safety and effectiveness of various common local interventions, such as joint aspiration and intra-articular injection. US may complement with clinical examination and conventional radiography in the assessment and management of knee OA.

Ultrasound in Evaluation of Knee Osteoarthritis

Over the past decade, there has been growing interest in the application of US in knee OA. Structural changes, including cartilage thinning and damage, osteophytes (Figure 1), and meniscal damage (Figure 2), especially the medial meniscus, can be detected by US. Less commonly, inflammatory features of OA, such as joint effusion, synovial hypertrophy, and increased vascularity (Figure 3), can also be easily identified by US. Previous studies have reported a significant correlation between US-detected cartilage changes and arthroscopic findings at the sulcus and medial femoral condyle.

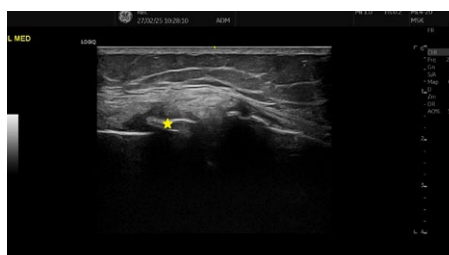


Figure 1 - Large osteophyte over medial femorotibial space, characterised by step-up of bony prominence at the end of the normal bone contour with acoustic shadow.



Figure 2 - Protrusion of the medial meniscus.



Figure 3 - Longitudinal scan of the suprapatellar recess showing synovial hypertrophy (in red star) and effusion (in yellow star), with no Power Doppler signal.

The Outcome Measures in Rheumatology (OMERACT) Ultrasound Task Force published a consensus report in 2016, establishing a standardised protocol for assessing structural and inflammatory abnormalities in knee OA, employing dichotomous scoring for synovitis and semi-quantitative scoring for other OA features (Table 1). A study published in 2021 involving 89 patients demonstrated significant correlations between US scores and pain severity, as well as X-ray and MRI knee OA grading. Specifically, US-detected synovial hypertrophy, power Doppler activity, and meniscal extrusion were associated with more severe pain. US findings may also have a prognostic role in knee OA. Medial meniscus extrusion detected by US is associated with future development of radiographic OA.

MUSCULOSKELETAL ULTRASONOGRAPHY IN KNEE OSTEOARTHRITIS

Table 1 - Anatomic structures, lesions and ultrasound scanning methods for knee osteoarthritis (modified from reference 2)

Anatomical Structures	Lesions	Scanning Methods
Suprapatellar recess	Synovitis, synovial hypertrophy, effusion, Power doppler signal	Patient in supine position with knee flexed 30 degrees. Probe placed longitudinally on distal thigh at the midline, moving lateral to medial side
Parapatellar recess (medial and lateral)	Synovitis, synovial hypertrophy, effusion, Power doppler signal	Patient in supine position with knee in neutral position. Probe placed transversely with one end over the patella, and the other end over the femoral condyle (medial and lateral), moving proximal to distal
Trochlear cartilage	Cartilage damage	Patient in supine position with knee in full flexion. Probe placed transversely just proximal to the patella, moving lateral to medial side
Femorotibial space (medial and lateral)	Osteophytes	Patient in supine position with knee flexed 10 degrees. Probe over the femoral condyle (medial and lateral), moving anterior to posterior
Anterior horn of medial meniscus	Meniscal damage (meniscal protrusion)	Patient in supine position with knee flexed 10 degrees. Probe over the medial femoral condyle, moving anterior to posterior

Baker's cyst (popliteal cyst) is a common finding in patients with knee OA. One study in 2015 suggested that synovial hypertrophy and Baker's cyst detected by US were associated with clinical and radiological OA progression at 2 years. US can also differentiate OA from other arthritis. For instance, crystal arthropathies, such as gout, exhibit distinct sonographic features related to crystal deposition, including aggregates, tophi, and double contour sign. Inflammatory arthritis may show pronounced hypervascularity and erosive changes, while seronegative spondyloarthropathies often present with features such as enthesopathy and enthesitis. A detailed discussion of these conditions is beyond the scope of this article.

Limitation of Ultrasound in Knee Osteoarthritis

Only a portion of the femoral condyle cartilage is accessible by US due to the acoustic shadow of the patella. The tibial plateau and the retro-patellar cartilage cannot be assessed by US. US has a limited role in assessing meniscal tears and subchondral bone. Consistent with ultrasonography of other anatomical regions, findings in knee US remain operator-dependent. Intra- and inter-observer reliability for detecting and measuring cartilage changes is modest.

Nevertheless, simple bedside ultrasound remains an invaluable, easily accessible, and relatively simple tool that continues to serve frontline clinicians effectively. Simple pathologies, such as osteophytes and joint effusion, can be reliably identified even by less experienced practitioners.

Ultrasound-guided Therapeutic Interventions

Ultrasound-guided procedures enhance precision in the management of knee osteoarthritis. Real-time visualisation ensures accurate needle placement for joint aspiration and intra-articular injections. Studies have suggested that ultrasound-guided corticosteroid injection for knee OA significantly improves accuracy and therapeutic efficacy compared to landmark-guided injection.

Patient Education and Engagement

Seeing is believing. Real-time US imaging enhances patients' understanding of knee OA by visualising joint pathology during consultations. This may alleviate concerns about serious conditions, such as inflammatory arthritis like rheumatoid arthritis. It may improve disease acceptance and adherence to lifestyle measures and physical exercises.

Future Directions

Advancements in ultrasound technology, such as the development of high-frequency transducers and better machines, have significantly improved spatial resolution and diagnostic accuracy in musculoskeletal imaging. Beyond hardware, recent innovations like integration of artificial intelligence (AI) and robotic automation have shown promising results in pilot studies in rheumatoid arthritis. The application of AI may facilitate automated detection and quantification of pathological features in images, potentially reducing operator dependency and variability, a notable limitation of current US practice in OA. Robotic scanning systems may further enhance reproducibility and efficiency, optimising the use of limited clinical resources, particularly where access to rheumatology ultrasound is scarce. Despite these exciting technological advancements, substantial challenges still lie ahead before these technologies can be integrated into the management of OA and routine clinical care.

References

1. Hunter DJ, Bierma-Zeinstra S. Osteoarthritis. *Lancet*. 2019;393(10182):1745-1759. doi:10.1016/S0140-6736(19)30417-9
2. Bruyn GAW, Naredo E, Damjanov N, et al. An OMERACT reliability exercise of inflammatory and structural abnormalities in patients with knee osteoarthritis using ultrasound assessment. *Ann Rheum Dis*. 2016;75(5):842-846. doi:10.1136/annrheumdis-2014-206774
3. D'Agostino V, Sorriento A, Cafarelli A, et al. Ultrasound Imaging in Knee Osteoarthritis: Current Role, Recent Advancements, and Future Perspectives. *J Clin Med*. 2024;13(16). doi:10.3390/jcm13164930
4. Oo WM, Linklater JM, Bennell KL, et al. Are OMERACT knee osteoarthritis ultrasound scores associated with pain severity, other symptoms, and radiographic and magnetic resonance imaging findings? *Journal of Rheumatology*. 2021;48(2):270-278. doi:10.3899/jrheum.191291
5. Bevers K, Vriezekolk JE, Bijlsma JWJ, van den Ende CHM, den Broeder AA. Ultrasonographic predictors for clinical and radiological progression in knee osteoarthritis after 2 years of follow-up. *Rheumatology (United Kingdom)*. 2015;54(11):2000-2003. doi:10.1093/rheumatology/kev224
6. Nevalainen MT, Uusimaa AP, Saarakkala S. The ultrasound assessment of osteoarthritis: the status. *Skeletal Radiol*. 2023;52(11):2271-2282. doi:10.1007/s00256-023-04342-3

OVERSEAS TRAINING ON MUSCULOSKELETAL ULTRASOUND IN DENMARK

Dr. Lydia TAM

Associate Consultant, PWH

I had the privilege of undergoing musculoskeletal ultrasound (MSUS) training for six months in 2024 at the Center for Rheumatology and Spinal Diseases of Rigshospitalet Glostrup, Copenhagen University Hospital. This experience was immensely fruitful, allowing me to enhance my skills under the guidance of world-renowned experts while working with a diverse patient population.

The Role of MSUS in Evaluating Joint Diseases

Patients frequently present with joint pain, however it may be difficult to differentiate its nature by clinical examination alone. MSUS has emerged as a pivotal tool in the evaluation and management of rheumatological diseases. Its non-invasive nature, real-time imaging capabilities, and superior sensitivity in detecting early inflammatory changes make it indispensable in clinical practice.

Rheumatologists utilize MSUS to supplement the clinical assessment of joints, tendons, entheses, and soft tissues in the evaluation of arthritis. This imaging technique allows for the visualization of inflammation, as indicated by synovial swelling and increased blood flow (Doppler signal). Additionally, MSUS can assess features of more aggressive or advanced disease, such as bone erosions. Specific ultrasound characteristics can also aid in differentiating diagnoses, including crystal arthropathies and osteoarthritis. In addition to its diagnostic properties, ultrasound is a valuable tool for guiding joint and soft tissue injections.

Broader Applications Beyond the Joints

In recent years, the application of ultrasound has expanded beyond joint evaluations. Ultrasound of the salivary glands adds significant value to the evaluation of Sjögren's syndrome and IgG4- related disease. Lung ultrasound has gained increasing interest for screening interstitial lung disease associated with connective tissue diseases.

Giant cell arteritis (GCA) is a rare disease in Hong Kong, but it is much more prevalent among Scandinavians. Ultrasound of the temporal arteries and large vessels plays a critical role in the timely diagnosis of GCA, facilitating early treatment to prevent major complications like vision loss. In Copenhagen, fast-track clinics have been established to ensure that patients with suspected GCA receive ultrasound evaluations by rheumatologists within 24 hours. This higher case load was invaluable for refining my skills in vascular ultrasound.

Innovative Technological Advances

In addition to hands-on training, I actively participated in several research projects at the center. One notable project involved the validation of an innovative ultrasound robot named ARTHUR, designed to automate ultrasound examinations of the wrists and hands.

This artificial intelligence-driven system also analyses images and grades the severity of synovitis, showcasing the potential of technology to streamline the management of arthritis. Witnessing ARTHUR in clinical practice was an eye-opening experience, revealing the rapid technological advancements in patient care.



Conclusion

Musculoskeletal ultrasound is an indispensable tool in our daily clinical practice, with exciting potential and ongoing developments. With the enhancement of local training and experience, we can look forward to improved clinical outcomes for our patients.

KNEE OSTEOARTHRITIS: THE STAGE FOR BETTER CARE (PHYSIOTHERAPY PERSPECTIVE)

Ms. Chris Hong-yuen CHOW¹; Ms. Kathy Oi-ling AU²
Senior Physiotherapist, Physiotherapy Department, United Christian Hospital^{1,2}

Knee osteoarthritis (OA knee) was traditionally regarded as a degenerative joint disease characterized by progressive wear and tear of the articular cartilage due to ageing or repeated use of the knee joint. Recent insights have increased the recognition of OA knee as a whole-joint disease, with a complex pathogenesis involving mechanical, inflammatory, and metabolic factors.^{1,2} Common signs and symptoms include pain, stiffness, crepitus, swelling of the knee joint, and impaired function. In more advanced cases, deformity of the knee joints is often observed. Risk factors for OA knee include ageing, previous knee injury, malalignment of lower limbs, race or ethnicity, obesity, metabolic syndrome, genetic predisposition, and female sex^{1,2,3}. Physical inactivity and muscle weakness may also play a role^{1,3}.

OA knee usually progresses in stages; the Kellgren-Lawrence Classification remains the most widely used clinical tool for the radiographic diagnosis of osteoarthritis.⁴ Higher KL grades are usually associated with more severe pain, impaired function, or even deformity. However, there are other factors affecting pain and function independent of radiographic changes.

Grade	Radiographic Features
Grade 0	No radiographic features of OA
Grade 1	Doubtful joint space narrowing; possible osteophyte formation
Grade 2	Definite osteophytes; possible joint space narrowing
Grade 3	Moderate osteophytes; definite joint space narrowing; some sclerosis; possible bone end deformity
Grade 4	Large osteophytes; marked joint space narrowing; severe sclerosis; definite bone end deformity

Contemporary physiotherapy management of knee osteoarthritis (OA knee) usually includes⁵:

- Patient Education
- Supervised Exercise / Neuromuscular Training
- Self-Management / Coping Strategies
- Electro-Physical Modalities such as TENS and Acupuncture
- Manual Therapy / Massage, etc.

A staged care model (or pathway) that matches the stages of disease progression is important in providing better physiotherapy services for patients with OA knees (Figure 1).

Continuum of Physiotherapy (Stage Care Model) for OA Knee

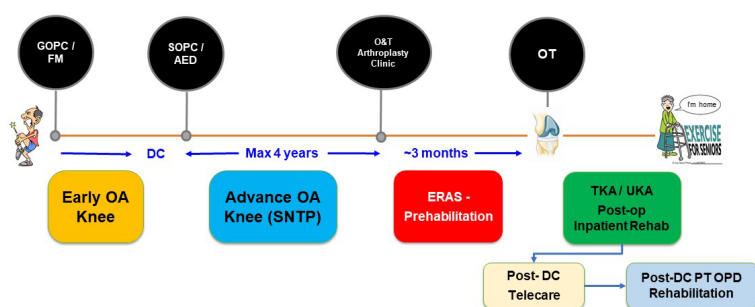


Figure 1: (Physiotherapy Stage Care Model for OA Knee.) AED = Accident & Emergency Department, DC = Discharge, ERAS = Early recovery after surgery, FM = Family Medicine, GOPC = General Outpatient Clinic, OPD = Outpatient department, OT = Operation, O&T = Orthopedics & Traumatology, PT = Physiotherapy, SNTP = Structured Non-surgical Training Program, TKA = Total knee arthroplasty, UKA = Uni-compartmental Knee Arthroplasty

Physiotherapy Management for Early OA Knee

Patients with early changes of OA knee are usually younger and have minimal to mild symptoms only. Signs of OA knee are usually not marked, and functional limitations are usually not obvious. They are often referred from general practitioners or family physicians. The objectives of physiotherapy management at this stage emphasize education on risk factors and the disease nature; symptom control; and correcting reversible elements, if any (such as joint range of motion and muscle strength) to break the vicious cycle, as well as improving functional mobility and empowering self-management. Physiotherapy intervention usually includes those listed in the above session. However, the highlight of physiotherapy intervention at this stage is the “Neuromuscular Control Training” (Figure 2), which was conceptualized from a structured Danish program named “GLA:D®”⁶.



Figure 2: Neuromuscular Control Training

KNEE OSTEOARTHRITIS: THE STAGE FOR BETTER CARE (PHYSIOTHERAPY PERSPECTIVE)

Physiotherapy Management for Advanced OA Knee

Disease progression may slow down with adequate management in the early stage. However, due to the nature of OA, most patients will eventually experience further degeneration over time. Patients at this stage are usually referred from the Specialized Outpatient Clinic (SOPC) or Accident & Emergency Department (AED). The framework of physiotherapy intervention still follows the contemporary management listed above. However, under the Hospital Authority, the highlight of management at this stage is a structured program named the Structured Non-surgical Training Program (SNTP). This model uses a case management approach, emphasizing coordinated care, goal setting, self-management techniques, coping strategies, ongoing feedback from patients, and a close working partnership among the care coordinator, patient, and specialists. The timeframe of this structured program for a particular patient can last up to four years. This management model was inspired by the “ESCAPE-pain Program” developed in the UK^{7,8}, following the Central Commissioned Training Program for Physiotherapists launched in 2018, which was rolled out to all clusters of the Hospital Authority.

Early Recovery After Surgery (ERAS)

Patients who have failed conservative management for their OA knee may ultimately undergo total knee arthroplasty (TKA). Cases with less degenerative knees may consider unicompartimentalized knee arthroplasty (UKA). To enhance the quality of care and better utilize public resources, the concept of ERAS has been evolved over the years. Through concerted effort and a multidisciplinary approach, patients with surgical needs are better prepared. Elements of ERAS include prehabilitation, early identification of social problems and discharge planning, improved peri-operative care including pain control, early mobilization, and early removal of catheters etc.; and intensified physiotherapy in the acute stage, including weekend service (Figures 3 & 4). The ERAS program for patients with TKA or UKA was shown to be effective in our hospital. Data collected from Jan 2021 to Dec 2022 indicated that 31% of patients who underwent UKA could be discharged on the day of surgery, with the average hospital length of stay for 74 UKA patients being 1.66 days (Figure 5).



Figures 3 & 4: Intensive Post-op Treatment and Rehabilitation

Timely Post-discharge Rehabilitation after Surgery and Telecare

Patients who have undergone TKA or UKA will receive timely post-discharge physiotherapy follow-up. Traditionally, patients after surgery would attend physiotherapy outpatient clinics for follow-up within 2 weeks. Recently, telecare with interim follow-up prior to the patient’s first physical appointment has been trialled with satisfactory results (Figure 6). Positive feedback from patients includes: there is no need to travel during the relatively acute stage; caregivers do not need to take leave for the patients’ follow-up; and cost savings, etc. Evaluation of patient outcomes in our department has been conducted and showed no adverse effects from interim telecare. Studies conducted done in foreign countries echo that telerehabilitation programs were not inferior to conventional outpatient care⁹.

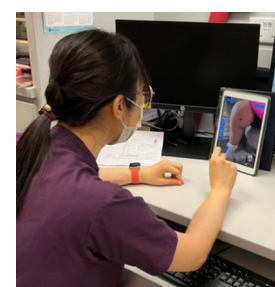


Figure 6: Post-discharge Telecare Physiotherapy Follow-Up

DOS Discharge after UKA is Possible!

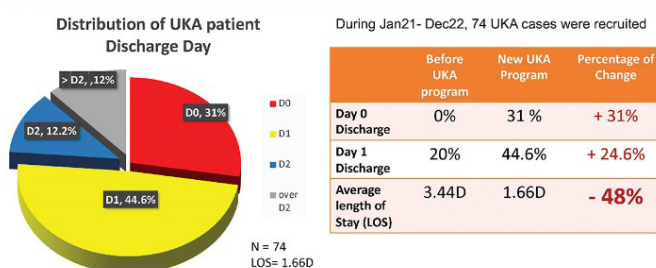


Figure 5: Hospital LOS of UKA Patients

References

- Hunter DJ, Bierma-Zeinstra S. Osteoarthritis. *The Lancet* 2019 Apr; 393: 1745-1759
- Loeser RF, Goldring SR, Scanzello CR, et al. Osteoarthritis: A disease of the joint as an organ. *Arthritis & Rheumatism* 2012 Jun; 64(6): 1697-1707
- Shtroblia V, Petakh P, Kamyshna I, et al. Recent advances in the management of knee osteoarthritis: a narrative review. *Frontiers in Medicine* 2025 Jan; 12: 1523027
- Kohn MD, Sassoon AA, Fernando ND. Classification in Brief: Kellgren-Lawrence Classification of Osteoarthritis. *Clinical Orthopaedics and Related Research* 2016 Aug; 474(8): 1886-93
- American Academy of Orthopaedic Surgeons Management of Osteoarthritis of the Knee (NonArthroplasty) Evidence-Based Clinical Practice Guideline. <https://www.aaos.org/oak3cpg> Published 08/31/2021
- Skou ST, Ougaard A, Rasmussen JO et al. Group Education and Exercise is Feasible in Knee and Hip Osteoarthritis. *Danish Medical Journal* 2012 Dec; 59(12): A4554. PMID:23290290
- Hurley MV, Walsh NE, Mitchell HL, et al. Clinical Effectiveness of a Rehabilitation Program Integrating Exercise, Self-Management, and Active Coping Strategies for Chronic Knee Pain: A Cluster Randomized Trial. *Arthritis & Rheumatism* 2007 Oct; 57(7): 1211-9
- Hurley MV, Walsh NE, Mitchell HL, et al. Economic Evaluation of a Rehabilitation Program Integrating Exercises, Self-Management, and Active Coping Strategies for Chronic Knee Pain. *Arthritis & Rheumatism* 2007 Oct; 57(7): 1220-9
- Venosa M, Romanini E, Ciminello E, et al. Telerehabilitation Is a Valid Option for Total Knee Arthroplasty Patients: A Retrospective Pilot Study Based on Our Experience during the COVID-19 Pandemic. *Healthcare (Basel)* 2023 Sep; 11(18): 2489

SPECIALISED NURSING SERVICE FOR PATIENTS UNDERGOING KNEE REPLACEMENT DUE TO OSTEOARTHRITIS

Dr. Ka-kit TSANG

KCC/QEH Nurse Consultant (O&T)

Introduction:

Osteoarthritis (OA) is one of the most common forms of joint diseases. It can be caused by repeated injuries, obesity, and ageing¹. Among all joints, the knee is the most affected joint by OA. The pooled global prevalence of knee OA is 22.9% among individuals aged 40 and above. In 2020, an estimated 654.1 million people aged 40 and older were living with knee OA worldwide². Although the causes are multifactorial, the clinical symptoms of OA are typically characterized by pain and functional impairment. Treatment modalities vary depending on the stage of disease progression, ranging from conservative management to surgical intervention. Partial knee arthroplasty is generally indicated for patients with stage 1 or 2 knee OA, while total knee arthroplasty is required for those with stage 3 or 4 OA³.

As of 31 March, 2025, a total of 5,144 joint replacement surgeries were performed in hospitals under the Hospital Authority during the preceding financial year, with approximately 80% of these being knee replacements. Due to the high demand, proper preparation and coordination are essential for ensuring a smooth surgical journey for patients. In Hong Kong, specialised nursing services have been developed in joint replacement centres to support patients throughout the entire care continuum — from pre-hospitalisation to post-discharge. This paper introduces the nursing services provided in this context.

Significance of Joint replacement surgery

The primary goals of knee joint replacement surgery are to relieve pain, improve mobility, enhance ability to perform activities of daily living (ADLs), and improve emotional well-being. Studies on patient-reported outcomes have shown significant improvements in health-related quality of life, functional scores, post-operative pain levels, and overall patient satisfaction following knee replacement surgery⁴.

There are two main types of knee replacement surgery. Total knee replacement (TKR) involves replacing the entire knee joint with artificial components and is typically recommended for patients with severe knee joint degeneration. The other type is partial knee replacement, also known as unicompartmental knee replacement (UKR), in which only the damaged compartment of the knee is replaced.

Modern prostheses can last approximately 15 to 20 years, making both pre-operative preparation and post-operative care critically important. In our current nursing service model, both TKR and UKR patients receive specialized care. Studies have shown that specialised joint replacement nursing services can improve patients' functional recovery after knee replacement surgery⁵.

Pre-operative nursing service

The specialty-based nursing service typically begins about one year before the knee replacement surgery. Once a patient receives a confirmed surgery date, the surgeon will refer them to joint specialist nurses, who then contact the patient to attend the pre-operative joint replacement nurse clinic. During the initial session, nurses address the patient's and their family's fears and anxieties. Counselling and psychological preparation are essential components at the start of the patient's journey. In addition, nurses provide education on the knee replacement procedure, including surgical details, and a patient information booklet is distributed.

Physical assessments, including knee scoring, are also conducted. Nutritional counselling and weight management are emphasized, as overweight and obesity are common in this patient population. Nurses educate patients on the importance of muscle-strengthening exercises and encourage them to begin home training to support post-operative recovery.

Approximately three months before surgery, the joint specialist nurses meet with the patient again. During this session, the specific details of the knee replacement procedure are thoroughly explained. Expectations for recovery are clearly communicated to both the patient and their family, and the recovery process is thoroughly explored. Many patients expect to be pain-free and regain full active range of motion (AROM) after surgery. Managing such expectations is a crucial aspect of this session.

Education is also provided regarding the roles of the patient and their caregivers, especially during the post-discharge phase. Nurses assess the patient's social support network, and if insufficient support from family or caregiver is identified, referrals to social workers are made and relevant community resources are introduced. Discharge planning and the expected length of hospital stay (LOS) are discussed during this session. Currently, same-day admission is promoted, and nurses explain its benefits while exploring the patient's willingness to participate. With surgery approaches, logistical details of the admission process are reviewed.

SPECIALISED NURSING SERVICE FOR PATIENTS UNDERGOING KNEE REPLACEMENT DUE TO OSTEOARTHRITIS

Physical assessments, including updated knee scores, AROM measurements, and skin assessments of both legs, are repeated. Methicillin-resistant *Staphylococcus aureus* (MRSA) screening is also performed. If MRSA is detected, a decolonization protocol will be implemented prior to surgery. Studies have shown that MRSA screening and decolonization significantly reduce the risk of post-operative wound infections⁶.

Immediate post-operative nursing service

At this stage, pain management and wound care are critical. Under a standardised pain management protocol, joint specialist nurses are responsible for monitoring the effectiveness of pain control and identifying any side effects, such as dizziness or vomiting. They also serve as care coordinators, working closely with ward nurses, surgeons, pain management nurses, and anesthetists. In addition to pharmacological methods, cryopneumatic therapy is a common nursing intervention. This technique not only reduces inflammation and pain through cold therapy but also minimizes swelling through compression⁷.

Regarding surgical wound and drain care, joint specialist nurses monitor for signs of wound infection and hematoma formation beginning on post-operative day one. The use of negative pressure wound therapy (NPWT) is a specialised care strategy for patients who have undergone total or partial knee replacement (TKR/UKR). When hematomas are identified, specialist nurses perform drainage procedures to help prevent wound infections. Patients undergoing knee replacement surgery are at high risk for venous thromboembolism (VTE). Specialist nurses utilize risk assessment tools, such as the Autar Scale, to stratify VTE risk and implement standardised interventions based on protocol. VTE prophylaxis includes the use of anti-thrombotic stockings, graduated compression stockings, and pneumatic compression devices. For patients at extremely high risk, anticoagulant therapy is prescribed by the surgeon.

Pressure injury prevention is also a core component of post-operative nursing care. Specialist nurses assess patients for risk factors and implement preventive measures, including pressure-relieving mattresses and prophylactic dressings for high-risk areas. To promote early mobilisation, specialist nurses collaborate with physiotherapists to monitor and facilitate the patient's rehabilitation progress. Before discharge, joint specialist nurses assess the patient's readiness for home care, including caregiver support, meal delivery services, and transportation arrangements.

Post-Discharge Nursing Service

The patient will return to the nurse clinic on post-operative day 14. A joint specialist nurse will remove the staples and manage any wound dehiscence or gapping. If necessary, the patient may receive additional follow-up through the nurse clinic or telehealth services. Post-operative scar management is another key component of care. Nurses will educate the patient on proper scar management techniques, including scar massage and the use of scar care products.

Specialist nurses will review the patient at 1, 6, and 12 months post-operatively. During each visit, assessments will include the knee score, scar condition, active range of motion (AROM) of the knee, swelling control in the affected limb, weight management, and dietary habits. Counselling and education will be provided to both the patients and their caregiver, particularly if any difficulties arise.

Approximately one year after surgery, a face-to-face post-operative sharing session with the patients and their caregivers will be held. Adjustments in ADLs will be discussed during this session. Trained patient volunteers, will also be invited to share their recovery experiences and success stories. After completing one year of joint specialist nursing service, patients will return to the standard care pathway.

Summary

TKR and UKR surgeries constitute most joint replacement procedures. To maximise patient outcomes and enhance the cost-effectiveness of healthcare resource utilisation, the previously fragmented services have been reorganised into a standardised nursing care model, spanning from one year before to one year after surgery. This comprehensive service encompasses all essential nursing interventions throughout the knee replacement journey. Evaluation of service outcomes has demonstrated improvements, including increased rates of same-day admissions, reduced LOS, and enhanced patient satisfaction.

References

1. Pelletier JP, Paiement P, Dorais M, Raynauld JP, Martel-Pelletier J. Risk factors for the long-term incidence and progression of knee osteoarthritis in older adults: role of nonsurgical injury. *Ther Adv Chronic Dis*. 2023;14:20406223231169715.
2. Cui A, Li H, Wang D, Zhong J, Chen Y, Lu H. Global, regional prevalence, incidence and risk factors of knee osteoarthritis in population-based studies. *EClinicalMedicine*. 2020;29-30:100587.
3. Oosthuizen CR, Takahashi T, Rogan M, Snyckers CH, Vermaak DP, Jones GG, et al. The Knee Osteoarthritis Grading System for Arthroplasty. *J Arthroplasty*. 2019;34(3):450-5.
4. Rolfson O, Eresian Chenok K, Bohm E, Lubbeke A, Denissen G, Dunn J, et al. Patient-reported outcome measures in arthroplasty registries. *Acta Orthop*. 2016;87 Suppl 1(Suppl 1):3-8.
5. Sun J, Xu Y, Zhu J, Zhu B, Gao W. Efficacy and safety of continuous nursing in improving functional recovery after total hip or knee arthroplasty in older adults: A systematic review. *Int J Nurs Sci*. 2024;11(2):286-94.
6. Westgeest AC, Hanssen JJJ, de Boer MGJ, Schippers EF, Lambregts MMC. Eradication of community-onset Methicillin-resistant *Staphylococcus aureus* carriage: a narrative review. *Clin Microbiol Infect*. 2025;31(2):173-81.
7. Sadoghi P, Hasenhutl S, Gruber G, Leitner L, Leithner A, Rumpold-Seitlinger G, et al. Impact of a new cryotherapy device on early rehabilitation after primary total knee arthroplasty (TKA): a prospective randomised controlled trial. *Int Orthop*. 2018;42(6):1265-73.

OCCUPATIONAL THERAPY AND TOTAL KNEE REPLACEMENT: A COMMUNITY-BASED PEO (PERSON-ENVIRONMENT-OCCUPATION) APPROACH

Mr. David Chi-ho LAU

Occupational Therapist, Hong Kong Senior Health Consultant Limited

Honorary Advisor, Elderly HealthCare Foundation Limited

Introduction:

Occupational therapy (OT) has a strong presence in the rehabilitation journey of patients undergoing total knee replacement (TKR). The Person–Environment–Occupation (PEO) model provides a holistic framework for TKR rehabilitation, emphasising how Patient factors (P), the Environment (E), and meaningful activities (Occupation) interact. OT uses this lens to restore independence and promote active participation in daily life. Interventions in physical, cognitive, and psychological domains ("Person"), adapt the home and the community ("Environment"), and engage patients in meaningful self-care, domestic and leisure activities ("Occupation"). Importantly, OT also addresses the psychosocial needs (anxiety, pain coping, fear of movement) and collaborates with stakeholders (housing, social services, caregivers) to support safe and sustained recovery of patients.

Restoring Independence in Self-Care and Daily Activities

OT interventions after TKR focus on enabling self-care and instrumental activities of daily living (ADL). This includes practicing dressing, bathing (often using aids like long-handled sponges), toileting transfers, and other functional tasks. During practice, therapists set specific, patient-centred goals (e.g., returning to independent showering or cooking) and train movement strategies (e.g. energy conservation during standing tasks). One study showed that a structured home OT programme with adaptive equipment increased patient satisfaction and improve their ability to perform ADLs with greater ease (1).

Home Assessment and Environmental Modifications

A core OT strategy is home assessment and modification. Therapists evaluate patients' homes to identify barriers and hazards and recommend modification (layout, structural or rehousing). Common modifications include installing grab bars, raised toilet seats, shower chairs and bed rails. Empirical evidence highlights the importance of proactive modifications. A qualitative study of older TKR patients noted that simple changes such as installing grab bars or removing clutter can significantly improve safety and confidence (2). In Hong Kong, the Housing Authority and Housing Society accepts OT-recommended adaptations (grab bars, shower chairs, even electric socket installations) to be made in public housing for older adults with mobility needs (3).

Assistive Devices and Adaptive Techniques

OT practitioners educate patients on safely using ambulation aids (such as walkers or long handled shoehorns) and applying task adaptations (e.g. sliding objects on rugs, using knee pads for kneeling). Installing household aids such as sock aids or adapted utensils enables continued participation in valued activities. Providing adaptive equipment for ADLs in the home significantly improves performance and satisfaction.

Psychological Support and Coping Strategies

Rehabilitation after TKR must address psychological factors. Many patients experience anxiety, pain-related distress, and fear of movement (kinesiophobia), which can inhibit participation. High fear-of-movement scores correlate with poorer function up to a year after surgery (4). OT integrates pain-coping and cognitive-behavioural techniques into practice. A recent trial found that TKR patients who received OT with explicit coping skills training achieved significantly greater improvement in goal attainment and satisfaction than controls (5). A case series reported that OT using coping strategies led to significant improvements in pain, anxiety/depression scores, quality of life, and ADL function (6).

Stakeholder Collaboration and Caregiver Support

Community-based OT involves collaboration with stakeholders and caregivers. Therapists liaise with housing authorities, social services, and family members to secure resources. In Hong Kong, the Housing Authority's special-needs scheme installs grab-bars and other supports upon professional recommendation (3). OT liaising with the Social Welfare Department or community grants could facilitate equipment subsidies for those who presented with financial problems. Family and informal caregivers are engaged as partners: therapists train them in safe transfer techniques, joint-protection principles, and strategies to encourage patient participation.

OCCUPATIONAL THERAPY AND TOTAL KNEE REPLACEMENT: A COMMUNITY-BASED PEO (PERSON-ENVIRONMENT-OCCUPATION) APPROACH

Summary of OT Intervention Domains

Domain	Examples of OT Interventions
Person	Exercise training; pain education; anxiety management; joint protection education
Environment	Home safety assessment; grab rails, shower chairs; furniture rearrangement; assistive equipment provision
Occupation	ADL/IADL training (e.g., dressing, bathing, cooking); energy-conservation; leisure activity adaptation

Table 1. Summary of OT intervention domains for community-dwelling TKR patients.

These domains (Person, Environment, Occupation) correspond to the PEO framework and illustrate the breadth of OT practice.

Author's Community Involvement

The author has participated in TKR community initiatives via the Elderly Healthcare Foundation, collaborating with local charities to deliver education and support to post-TKR patients. Such outreach reinforces best practices and supports community uptake of OT services.

Conclusion

OT is essential for maximising independence and quality of life after TKR. Using the PEO model, therapists assess the individual's capacity, modify home environment, and facilitate engagement in meaningful activities. Home modifications, assistive devices, and psychosocial support—coordinated with housing authorities, social services, and caregivers—collectively promote a safe and confident return to community living.



Installation of grab bar



Prescription of bath chair



Education on the use of ambulation aids

References

1. Stark S. Removing environmental barriers in the homes of older adults with disabilities improves occupational performance. *OTJR*. 2004;24(1):32-40
2. Rutali J.; Anjali J. Sahar M. et al. Understanding key home and community environment challenges encountered by older adults undergoing total knee or hip arthroplasty. *Gerontologist*. 2020 Sep 13;61(7):1071-1084
3. Hong Kong Housing Authority. Meeting the Needs of Physically Disabled [Internet]. [cited 2025 Jul 1]. Available from: <https://www.housingauthority.gov.hk/en/public-housing/meeting-special-needs/physically-disabled/index.html>
4. Oliver S. Hu L. Demetriou C. et al. The effects of kinesiophobia on outcome following total knee replacement: a systematic review. *Arch Orthop Trauma Surg*. 2020 Dec;140(12):2057-2070.
5. Ryusei H.; Yuki H.; Yoshiyuki H. et al. Effects of Integrating Pain Coping Strategies into occupational therapy after total knee arthroplasty: A parallel mixed method study. *Healthcare (Basel)*. 2025 Mar 13;13(6):627
6. Ryusei H.; Yuki H.; Yoshiyuki H. et al. Occupational therapy using coping lists after total knee arthroplasty: A case series. *Cureus*. 2022 July 14(7):27374

膝關節骨性關節炎的發生機理

劉達康醫師

香港防癆會 - 香港大學中醫診所暨教研中心 (南區)

中醫將此病歸屬「痹證」、「骨痹」、「歷節風」範疇，亦有文獻稱為「鶴膝風」，意思指其後期膝關節變型，形成類似鶴膝形狀之疾病，認為其發生與以下關鍵因素息息相關：

1. **肝腎虧虛 (本虛)：**「肝主筋，腎主骨」，而古云「膝者，筋之府，屈伸不能，行則僂附，筋將憊矣」，故膝關節乃筋所匯聚之處。年老肝腎精氣自然衰退，或長期勞損、房勞過度，加劇肝腎不足。筋骨失於濡養，變得脆弱，易受損傷，這是發病的根本。
2. **氣血不足 (本虛)：**氣虛無力推動血行，血虛則關節失潤。氣血虧虛，經脈空虛，外邪易侵，關節亦失所養。
3. **外邪侵襲 (標實)：**風、寒、濕、熱等外邪，乘人體正氣不足 (肝腎虧虛、氣血兩虛) 之時，侵襲經絡，留滯膝關節，導致氣血運行不暢，「不通則痛」。
4. **痰瘀互結 (標實)：**疾病遷延不癒，氣血長期運行不暢，則津液停聚成「痰」，血液滯澀成「瘀」。痰瘀互結，阻滯於關節筋骨之間，加重疼痛、腫脹、變形，使病情纏綿難癒。
5. **勞損外傷 (誘因)：**長期負重、劇烈運動、姿勢不良或曾經外傷，膝部筋骨脈絡的直接損傷，加速局部氣血瘀滯，成為誘發或加重因素。

綜上所述，本病以「肝腎虧虛、氣血不足」為發病之本，「風寒濕熱侵襲、痰瘀阻絡」為發病之標，屬於「本虛標實」之證。

中醫的整體調治

中醫治療強調「辨證論治」，根據患者證候，四診合參，制定個性化方案，常用方法包括：

1. 內服中藥：

根據痹證本虛標實的原則，中醫治療主要虛則補之，實則瀉之，虛為肝腎及氣血虛，實為風寒濕熱邪，從而調理根本，祛邪通絡，臨床實際處方大致如下：

- 補益肝腎，強筋壯骨：** 針對根本的肝腎虧虛。常用方劑如獨活寄生湯、左歸丸、右歸丸。常用藥物：熟地黃、山茱萸、枸杞子、杜仲、續斷、桑寄生、牛膝、骨碎補、龜板膠、鹿角膠等。
- 益氣養血：** 適用於氣血兩虛明顯者。常用方劑如八珍湯、黃芪桂枝五物湯。常用藥物：黃芪、黨參、白朮、當歸、白芍、川芎、雞血藤等。
- 祛風散寒除濕：** 針對風寒濕痹阻關節。常用方劑如蠲痹湯、烏頭湯 (須嚴格泡製並在醫師指導下使用)。常用藥物：羌活、獨活、防風、桂枝、細辛、製川烏、製草烏 (後兩者有毒，須慎用)、薏苡仁、蒼朮等。
- 清熱利濕：** 適用於關節紅腫熱痛的濕熱蘊結證。常用方劑如四妙丸、宣痹湯。常用藥物：黃柏、蒼朮、牛膝、薏苡仁、防己、忍冬藤、土茯苓等。
- 活血化癥，化痰通絡：** 針對痰瘀互結、疼痛劇烈、關節變形者。常用方劑如身痛逐瘀湯、桃紅四物湯合二陳湯。常用藥物：桃仁、紅花、當歸、川芎、赤芍、丹參、三七、乳香、沒藥、地龍、白芥子、膽南星等。
- 香港常用特色藥材：** 考慮本港氣候濕熱及常見體質，醫師常酌情加入五爪龍 (南芪)、牛大力、千斤拔、崗梅根等藥材，增強健脾祛濕、舒筋活絡之效。

以上各法或單一使用或多法並用，中醫師會按實際情況，隨證治之。但「冰封三尺，非一日之寒」，如果已到痰瘀互結之關節變型疼痛 (尪痹)，內服用藥須使用一段長時間 (少則半年，多則一年)，方能起效，患者需抱耐心接受醫治。

2. 針灸療法：

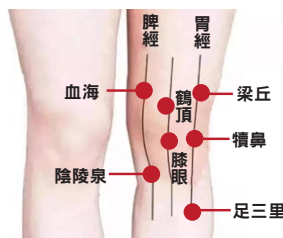
疏通經絡，活血止痛：針灸是治療膝骨關節炎的核心有效手段，通過刺激特定穴位起到疏通經絡氣血之用，從而改善膝關節局部及相關經絡的氣血運行，達到「通則不痛」。

膝關節骨性關節炎的發生機理

常用穴位：

局部取穴：

犢鼻（外膝眼）、
內膝眼、鶴頂、梁丘、
血海、陽陵泉、陰陵泉、
足三里。



循經取穴：

根據辨證，選取相關經脈的遠端穴位，如太沖（肝經）、太溪（腎經）、三陰交（肝脾胃三經交會）等以調補肝腎及阿是穴（膝關節周圍明顯的壓痛點）

特色針刺手法：

溫針灸：

在針柄上插艾條點燃，使熱力直透穴位深部，特別適合寒濕痹阻、陽氣不足的患者，能顯著增強溫經散寒、活血通絡的效果。

電針：

在針上連接電針儀，給予持續穩定的電刺激，能加強鎮痛和鬆解肌肉緊張的作用。

刺絡拔罐：

對於局部瘀血腫脹明顯者，可在特定穴位或壓痛點點刺後拔罐，放出少量瘀血，達到祛瘀生新、消腫止痛的目的。

本文內容僅供資訊參考，不能替代專業醫療建議、診斷或治療。如有任何醫療狀況或疑問，請務必諮詢合資格的註冊中醫師。筆者畢業於香港中文大學中醫學院（一級榮譽），現任職於香港防癆會 - 香港大學中醫診所暨教研中心（南區）

DISCLAIMER

All materials published in CHARM represent the opinions of the authors responsible for the articles and do not reflect the official views or policy of the Hong Kong Arthritis & Rheumatism Foundation.

Publication of an advertisement in CHARM does not constitute endorsement or approval of the product or service promoted or of any claims made by the advertisers with respect to such products or services.

The Hong Kong Arthritis & Rheumatism Foundation and CHARM assume no responsibility for any injury and/or damage to persons or property arising from any use of execution of any methods, treatments, therapy, operations, instructions, ideas contained in the printed articles. Because of rapid advances in medicine, independent verification of diagnoses, treatment method and drug dosage should be made.

DONATION

PayPal™

You can donate to the Foundation by scanning the QR Code and filling in PayPal donation form. Official receipt for the donation will be sent to each donor by post.



Direct Bank Deposit

Donations can be deposited to the following bank accounts of the Foundation:

Bank of China (Hong Kong): 012-595-2-015504-4 **HSBC: 502-054737-001**

Please email the receipt to mail@hkarf.org. Official receipt for the donation will be sent to each donor by post.

Faster Payment System (FPS)

FPS ID: 167242957

Please email the screenshot of the receipt to mail@hkarf.org. Official receipt for the donation will be sent to each donor by post.

By Cheque

You can send a crossed cheque made payable to “**Hong Kong Arthritis & Rheumatism Foundation Ltd**” by mail or in person to the Secretariat - Flat 103-106, Nam Wai House, Nam Shan Estate, Sham Shui Po, Kowloon.

CHARM is an official publication of the Hong Kong Arthritis and Rheumatism Foundation (HKARF), which is a charity entirely supported by voluntary contributions and public donations. If you wish to have further information about our work, or to make a donation or a monthly contribution, please contact us:

Hong Kong Arthritis & Rheumatism Foundation Ltd.

Flat 103-106, Nam Wai House,
Nam Shan Estate, Sham Shui Po, Kowloon

Tel : (852) 2346 6336
Fax : (852) 2346 6136

Email : mail@hkarf.org
Website : www.hkarf.org