

Composition and Features of APS  
自體血蛋白溶液的成份和特點

- Anti-inflammatory cytokines: Effectively counteracts joint inflammation  
**抗炎因子: 能有效對抗關節發炎**
- Growth factors: Support cartilage protection and repair  
**生長因子: 有助於軟骨保護與修復**
- Supraphysiological protein level: Higher than natural blood concentrations enhance therapeutic effects  
**抗炎及生長因子蛋白濃度比血液為高, 增強治療效果**

Treatment Mechanism  
治療機制

The prepared APS solution is injected directly into the affected joint, where it:  
將製備好的自體血蛋白溶液注射到促炎因子過多的關節腔內, 藉此:

- 1

**Restores protein balance**  
Suppresses excessive inflammation  
調節關節內的蛋白平衡, 有效抑制炎症反應
- 2

**Protects cartilage**  
Growth factors help slow degeneration and promote healing  
發揮生長因子的保護作用, 促進軟骨修復
- 3

**Reduces pain**  
By calming inflammation  
通過消炎減輕膝關節疼痛
- 4

**Enhances mobility**  
Patients experience improved knee function and flexibility  
改善活動功能, 患者的膝關節功能和靈活性得到改善

As a completely autologous (self-derived) treatment, APS offers a natural, safe, and effective solution for managing knee osteoarthritis pain and preserving joint health.  
由於這種療法完全採用患者自身的血液成分, 具有高度的生物相容性, 為退化性膝關節炎患者提供了一個安全有效的治療選擇。

Advantages  
優勢



**Day surgery procedure**  
Short hospital stay for few hours only  
**治療以日間手術形式進行**  
留院時間短至數小時



**Performed under sterile conditions**  
Ensures safety and minimizes infection risk  
**整個過程在嚴格無菌條件下完成**  
確保安全性及減低感染風險



**Minimal downtime**  
Most patients can resume light activities shortly after treatment  
**恢復期短**  
絕大部份患者在治療後不久即可恢復輕度活動

Patients who are appropriate  
for APS injection  
適合自體血蛋白溶液注射治療的患者

Any patient suffered from knee osteoarthritis is appropriate for the APS injection, especially:  
任何成年患者均適合自體血蛋白溶液注射治療, 尤其:

**Mild to moderate degeneration patients**  
Studies have shown that APS is most effective in pain reduction in patient with early and moderate stage of osteoarthritis  
**輕微至中度退化性關節炎患者**  
研究顯示自體血蛋白溶液注射治療於早期至中期關節退化階段使用, 疼痛緩解效果更顯著

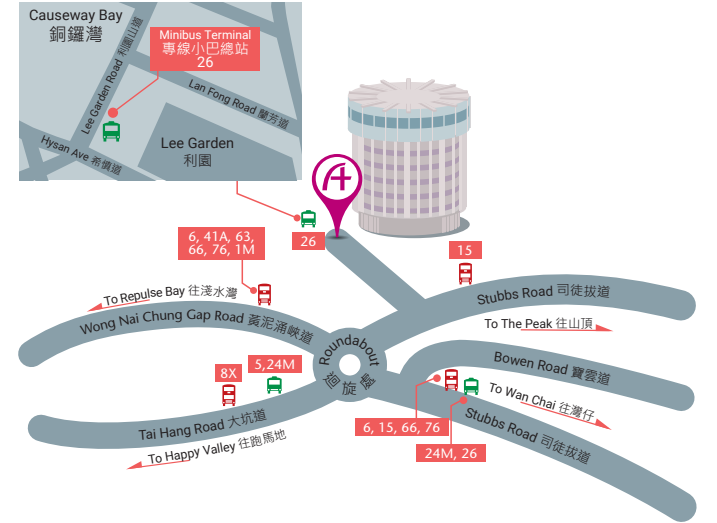
APS has received the following  
regulatory approvals/registration:  
自體血蛋白溶液  
已獲取以下認證/註冊:

- CE Mark in Europe, the Middle East, and Africa (EMEA) on 2012
- FDA clearance as a Platelet-rich plasma (PRP) product on 2023
- In the Asia Pacific region, APS has been cleared by local health authority as treatment of degenerative knee osteoarthritis in Australia, New Zealand, Japan, and Singapore
- Introduce to Hong Kong and Macau in 2016 and 2018 respectively, registered in Hong Kong Department of Health in 2020 as Medical Device [HKMD No.200424]
- 2012年取得歐洲、中東及非洲地區的CE標誌
- 2023年獲美國食品藥物管理局(FDA)核准作為PRP (高濃度血小板血漿) 療法
- 亞太地區: 獲澳洲、紐西蘭、日本及新加坡衛生機構批准作為療法治療退化性膝關節炎
- 香港及澳門: 分別於2016年及2018年開始引入, 2020年於香港衛生署註冊為醫療器械 [HKMD No.200424]

FAQ 常見問題

- 1. Can APS cure my Knee Osteoarthritis?**  
Currently, there is no medical evidence to support any single therapy that can completely cure degenerative knee osteoarthritis. However, APS injections can slow progression and reduce pain. Early treatment yields better results.  
**自體血蛋白溶液注射治療能治癒我的退化性膝關節炎嗎?**  
現時並沒有醫學研究指出任何一種治療能夠徹底治癒退化性膝關節炎。自體血蛋白溶液注射治療有效減緩退化和減輕疼痛, 越早治療效果越好。
- 2. How long does it take for APS injection to be effective?**  
Clinical studies showed that it will take about 4-6 weeks for patient to feel significant pain reduction.  
**APS注射治療需要多久才能見效?**  
研究顯示患者會於4至6星期感到疼痛顯著減少。
- 3. Do I need repetitive injection?**  
Most patients experience effective pain relief for 1 to 2 years after a single injection (Effect might vary and depends on the knee condition) When the therapeutic effects gradually diminish, patients can receive additional injections based on their needs.  
**是否需要重複注射?**  
大多數患者在接受單次注射後, 疼痛可有效緩解1至2年(視乎患者情況而定), 當療效逐漸減弱時, 患者可依據實際需求再次接受注射治療。

MAP  
路線圖



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**Clinical Studies Reference:** 臨床醫學文獻參考:  
**1.**King W, van der Weegen W, Van Drumpt R, Soons H, Toler K, Woodell-May J. White blood cell concentration correlates with increased concentrations of IL-1ra and improvement in WOMAC pain scores in an open-label safety study of autologous protein solution. *J Exp Orthop.* 2016;3:9. **2.**Kon E, Engebretsen L, Verdonk P, Neher S, Filardo G. Clinical outcomes of knee osteoarthritis treated with an autologous protein solution injection: A 1-year pilot double-blinded randomized controlled trial. *J Exp Orthop.* 2016;3:9. **3.**Kon E, Engebretsen L, Verdonk P, Neher S, Filardo G. Autologous protein solution injections for the treatment of knee osteoarthritis: 3-year results. *J Exp Orthop.* 2023;10(1):9. doi:10.1186/s40634-023-00501-5. **4.**Kon E, Verdonk P, Engebretsen L, Neher S, Di Martino A, Filardo G. "Duration effects of a single intra-articular injection of Autologous Protein Solution (APS) in patients with knee osteoarthritis (OA)". 15th World Congress of the International Cartilage Repair Society, Vancouver, Canada, Program #12.4.4 (#437), Oct. 5-8, 2019  
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for Knee Joint Pain  
膝關節疼痛的進階治療選擇

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PROTEIN SOLUTION  
INJECTION  
自體血蛋白溶液注射治療

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# What is Knee Osteoarthritis?

## 甚麼是退化性膝關節炎?

Osteoarthritis is a degenerative disease caused by long-term wear of cartilage in the joints, leading to inflammation, deformation, and bone spur growth. It primarily affects weight-bearing joints like the knees, hips, and fingers, with the knee joint being the most commonly affected area.

退化性關節炎是一種因關節軟骨長期磨損而導致的退化性疾病，會出現關節發炎、變形和骨刺增生。它主要影響經常承重的關節，如膝蓋、髖關節和手指關節，以膝關節最為常見。

## Symptom 症狀



As joints degenerate, cartilage softens or develops pits, causing mild inflammation and knee pain on stairs or inclines, along with soreness, redness, swelling, and tightness. In later stages, cartilage may wear away completely, leading to irregular joint surfaces and bone spurs. Patients experience stiffness, limited movement, and deformities like "O-shaped feet," which reduce range of motion and cause weakness, especially when climbing stairs or squatting.

隨著關節退化，軟骨會軟化或出現凹洞，導致輕度發炎，患者在上下樓梯或斜坡上會感到膝部疼痛，並伴隨痠痛、紅腫和緊繃感。後期，軟骨可能完全磨損，造成關節表面不平形成骨刺。患者會感到僵硬、活動受限，甚至出現「O型腳」的變形，這會降低關節的活動幅度，並在上下樓梯或蹲跪時感到無力。

## What is Autologous Protein Solution Injection (APS)?

### 甚麼是自體血蛋白溶液注射治療(APS)?

APS is an innovative treatment that utilizes the patient's own blood-derived proteins to alleviate pain caused by knee osteoarthritis. Since APS is prepared from the patient's own blood, it carries no risk of allergic reactions or immune rejection, making it a safe and targeted therapy for degenerative knee joint pain.

自體血蛋白溶液注射治療是一種利用患者自身血液中的蛋白成分來治療膝骨關節炎疼痛的創新療法。這種治療方法完全採用患者自身的生物活性蛋白，因此不會引發過敏或排斥反應，特別適合用於退化性膝關節炎引起的疼痛治療。

## How It Works 原理

The joints contain two key types of proteins:  
人體關節內存在兩類關鍵蛋白：

**Anti-inflammatory Cytokines ('Good' Protein)**  
抗炎因子 (優質蛋白)

Help suppress inflammation and protect joint tissues  
具有抑制炎症、保護關節的作用

**Pro-inflammatory Cytokines ('Bad' Protein)**  
促炎因子 (劣質蛋白)

Promote inflammation, leading to cartilage damage  
會加劇炎症反應，導致軟骨損傷

製造軟骨



抗炎因子

生長因子

破壞軟骨



促炎因子

In a healthy joint, these proteins remain in balance. However, in osteoarthritis, pro-inflammatory cytokines increase, disrupting this equilibrium and accelerating cartilage breakdown.

在健康狀態下，這兩類蛋白維持著動態平衡。但當關節退化時，促炎因子會過度增加，破壞這種平衡。

## Treatment Procedure 治療流程

STEP 1  
程序 1

### Blood Collection 抽血

- ▶ Draw approximately 60 mL of blood from a vein in your arm.  
從手臂靜脈抽取約 **60** 毫升的血液
- ▶ The process is quick and safe, similar to a routine blood test.  
整個抽血過程安全快速，類似常規血液檢查



STEP 3  
程序 3

### Injection 注射

- ▶ The prepared APS solution (approximately 3-4 mL) is injected into the affected knee joint by a physician.  
醫生將製備好約 **3-4** 毫升自體血蛋白溶液注射至受影響的膝關節內



- ▶ The injection is performed with precision to maximize therapeutic effects.  
注射過程精準執行，以達到最佳治療效果

STEP 2  
程序 2

### APS Preparation 製備

- ▶ The collected blood is immediately transferred to a sterile processing device.  
抽取的血液會立即轉移至無菌分離器中
- ▶ Using a specialized centrifuge, the blood is processed and concentrated into a high-potency autologous protein solution (APS).  
透過專用離心機進行分離與濃縮處理
- ▶ This step takes about 25 minutes.  
約 **25** 分鐘即可完成



STEP 4  
程序 4

### Post-Treatment Observation 術後觀察

- ▶ After the injection, rest for about 1 hour for monitoring.  
注射完成后需休息观察约 **1** 小时