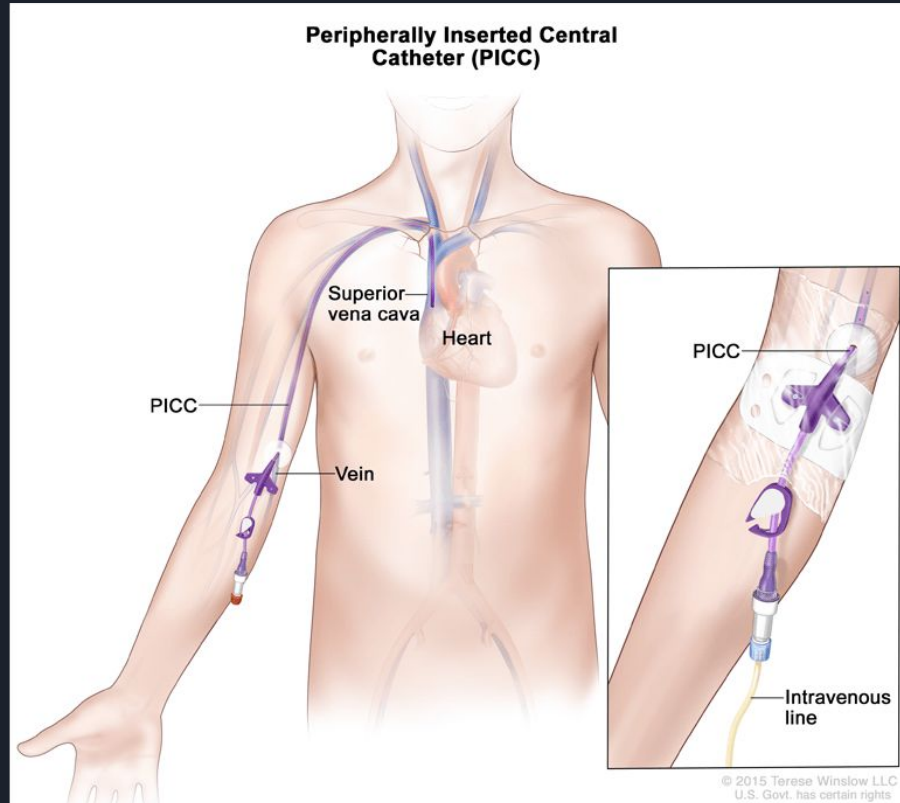




PICC & Midline

What is PICC



Teleflex Pressure Injectable PICC

1. BlueFlex Tip®

Soft, reduces damage to delicate intima during threading process¹

2. Staggered Exit Ports

Reduce risk of mixing incompatible drugs and solutions that may create precipitate²

3. Labeled Depth Marker

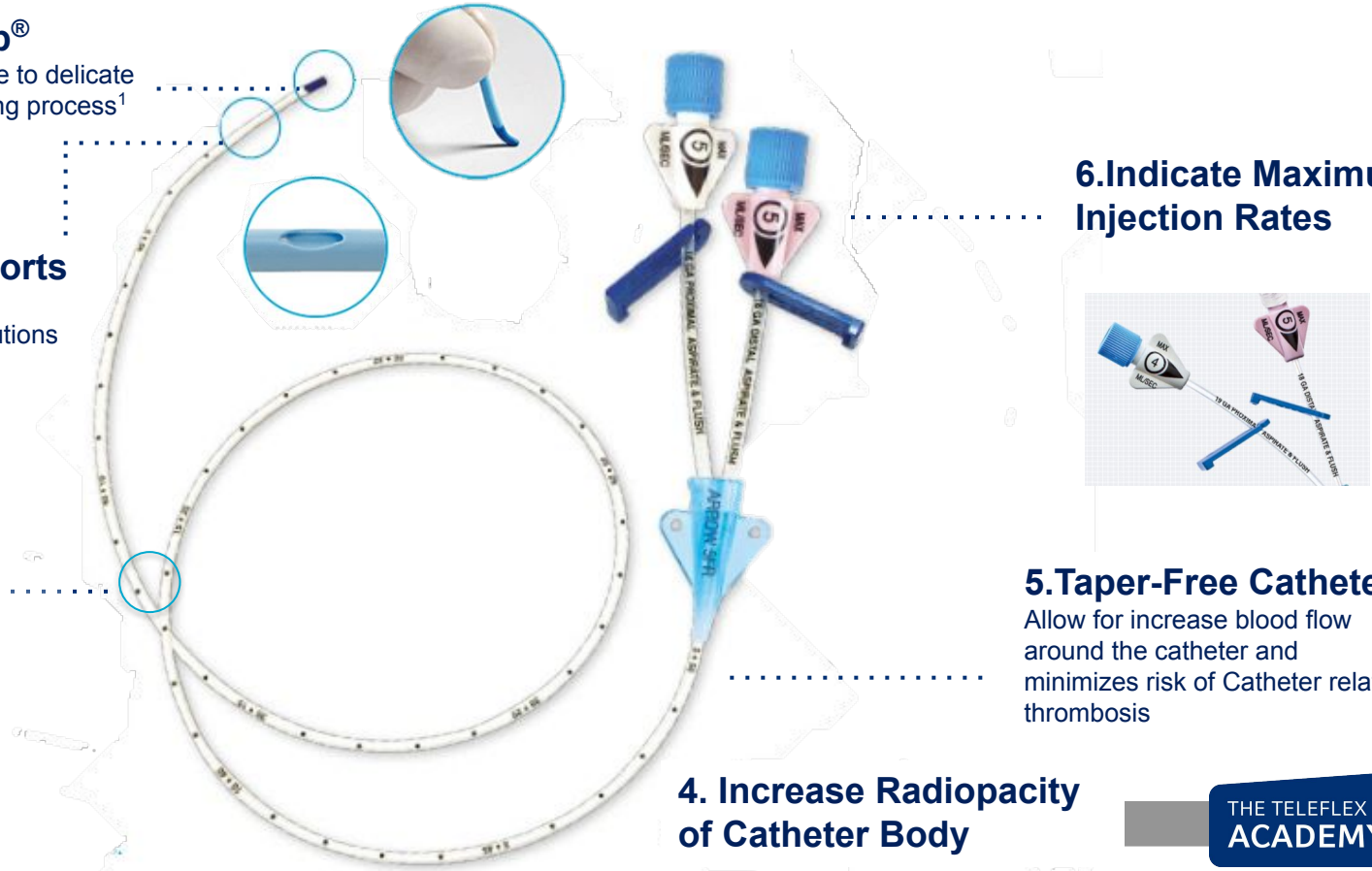
Every 1 cm on Catheter Body

4. Increase Radiopacity of Catheter Body

6. Indicate Maximum Injection Rates

5. Taper-Free Catheter

Allow for increase blood flow around the catheter and minimizes risk of Catheter related thrombosis



PICC vs CVC

	PICC	CVC
Occlusion ^[1]	Less	More
DVT	More	Less
CRBSI ^[2]	Less	More
舒適度	勝	
放置時間	up to 6 months	up to 14 days
Power injection	up to 5 mL/s	x

[1] Johansson E, Hammarskjöld F, Lundberg D, Arnlin M. Advantages and disadvantages of peripherally inserted central venous catheters (PICC) compared to other central venous lines: a systematic review of the literature. *Acta Oncol.* 2013;52:886-92.

[2] Böll, B., Schalk, E., Buchheidt, D. et al. Central venous catheter-related infections in hematology and oncology: 2020 updated guidelines on diagnosis, management, and prevention by the Infectious Diseases Working Party (AGIHO) of the German Society of Hematology and Medical Oncology (DGHO). *Ann Hematol* 100, 239–259 (2021)

如何選擇合適的靜脈管路

The Michigan Appropriateness Guide for Intravenous Catheters (MAGIC): Results From a Multispecialty Panel Using the RAND/UCLA Appropriateness Method FREE

Vineet Chopra, MD, MSc , Scott A. Flanders, MD, Sanjay Saint, MD, MPH, ... [View all authors](#) 

[Author, Article, and Disclosure Information](#)

<https://doi.org/10.7326/M15-0744>

For peripherally compatible infusate

Device Type	Proposed Duration of Infusion			
	≤5 d	6–14 d	15–30 d	≥31 d
Peripheral IV catheter	No preference between peripheral IV and US-guided peripheral IV catheters for use ≤5 d			
US-guided peripheral IV catheter	US-guided peripheral IV catheter preferred to peripheral IV catheter if proposed duration is 6–14 d			
Nontunneled/acute central venous catheter	Central venous catheter preferred in critically ill patients or if hemodynamic monitoring is needed for 6–14 d			
Midline catheter	Midline catheter preferred to PICC if proposed duration is ≤14 d			
PICC		PICC preferred to midline catheter if proposed duration of infusion is ≥15 d		
Tunneled catheter				PICC preferred to tunneled catheter and ports for infusion 15–30 d
Port				

Appropriate

Neutral

Inappropriate

Disagreement

For irritants or vesicants (TPN, 化療)

Device Type	Proposed Duration of Infusion			
	≤5 d	6–14 d	15–30 d	≥31 d
Peripheral IV catheter	Inappropriate	Inappropriate	Inappropriate	Inappropriate
US-guided peripheral IV catheter	Inappropriate	Inappropriate	Inappropriate	Inappropriate
Nontunneled/acute central venous catheter	Central venous catheter preferred in critically ill patients or if hemodynamic monitoring is needed for 6–14 d		Inappropriate	Inappropriate
Midline catheter	Inappropriate		Inappropriate	Inappropriate
PICC	Appropriate	PICCs rated as appropriate at all proposed durations of infusion		
Tunneled catheter	Inappropriate	Tunneled catheter neutral for use ≥15 d	No preference between tunneled catheter and PICC for proposed durations ≥15 d	
Port	Inappropriate	Inappropriate	Inappropriate	No preference among port, tunneled catheter, or PICC for ≥31 d

Appropriate

Neutral

Inappropriate

Disagreement

For difficult IV access

Device Type	Proposed Duration of Infusion			
	≤5 d	6–14 d	15–30 d	≥31 d
Peripheral IV catheter	No preference between peripheral IV and US-guided peripheral IV catheters for use ≤5 d			
US-guided peripheral IV catheter	US-guided peripheral IV catheters preferred to peripheral IV catheters if proposed duration is 6–14 d			
Midline catheter	Midline catheters preferred to PICC if proposed duration is ≤14 d			
Nontunneled/acute central venous catheter	Central venous catheter preferred to PICC for use ≤14 d in critically ill patients			
PICC	Disagreement on appropriateness of PICC for durations <5 d	PICC use appropriate if proposed duration is ≥6 d; PICCs preferred to tunneled catheters for durations of 15–30 d		
Tunneled catheter			Tunneled catheter neutral for difficult IV access for use ≥15 d	No preference between tunneled catheter or port for use ≥31 d
Port				

Appropriate

Neutral

Inappropriate

Disagreement



For CKD patient (eGFR<45)

American Society of Nephrology

[View all recommendations from this society](#)

Released April 4, 2012

Don't place peripherally inserted central catheters (PICC) in stage III-V CKD patients without consulting nephrology.

Venous preservation is critical for stage III–V CKD patients. Arteriovenous fistulas (AVF) are the best hemodialysis access, with fewer complications and lower patient mortality, versus grafts or catheters. Excessive venous puncture damages veins, destroying potential AVF sites. PICC lines and subclavian vein puncture can cause venous thrombosis and central vein stenosis. Early nephrology consultation increases AVF use at hemodialysis initiation and may avoid unnecessary PICC lines or central/peripheral vein puncture.



For solid tumor patient

- Higher DVT risk for PICC
- Tunneled, cuffed catheters 優於 PICC
- In patient with coagulopathy or thrombocytopenia: PICC preferred



For hemodynamically unstable patient

- Central access < 14 days: CVC
- Central access > 15 days: PICC
- Coagulopathy: PICC

MICHIGAN MAGIC - Now Available for Download!

The recommendations found in the [Michigan Appropriateness Guide for Intravenous Catheters \(MAGIC\)](#), can now be found in an easy to use mobile application available on the [iTunes App Store](#) and on the [Google Play Store](#).

The app is free and available for download for both iOS and Android platforms (if you're so inclined, the privacy policy for the app is [here](#)). Search "Michigan MAGIC" to find the app without the links above.

Based on user feedback, the Michigan Magic App will present the user with an easy to use set of recommendations on the appropriateness or inappropriateness of intravenous catheters as well as further information derived directly from [MAGIC](#). The app is designed to improve decision-making in vascular access!



DOWNLOAD MICHIGAN MAGIC - IOS

DOWNLOAD MICHIGAN MAGIC - ANDROID



Insertion selection

- Avoid infected skin, wound
- Avoid hemiplegic arm
- Avoid below elbow insertion
- 慣用手與非慣用手沒差

Peripheral Veins for PICC Insertion

Basilic (1st Choice)






**Brachial/ Paired
Brachials (2th Choice)**

Cephalic (3rd Choice)

**Median Cubital
(primarily blood draws)**



Insertion selection

			Radius of Vessel (mm) ⁴	Length (CM)	Actual Diameter
Cephalic			3 ⁴	38 cm	2-4 mm
Basilic			4 ⁴	24 cm	4-6 mm
Axillary			8 ⁴	13 cm	16 mm
Subclavian			9.5 ⁴	6 cm	19 mm
SVC			12.5 ⁴	7 cm	20 mm



Tip location

- Lower $\frac{1}{3}$ of SVC
- cavoatrial junction
- Right atrium if no atrial arrhythmia noted



PICC Care

- Normal saline flush preferred over heparin flush
- 若PICC外滑, 切勿內推
- Guidewire exchange is appropriate

沖管



Q8H以10 mL N/S推停推停方式沖洗一次，
推停推停方式沖洗方式:快速推進1-2ml &每次推進間隔約0.4秒¹



每次輸液前後、抽/輸血前後、更換管路及／或脂質輸注時



沖洗必須涵蓋所有導管管腔

採血/給予藥物

1. 停止全身靜脈輸注液體或血液製品 **2 分鐘**
2. 消毒無針連接器或導管銜接孔 **5-15秒**
3. 以 **10 mL N/S 推停推停方式**沖洗管路
4. 棄血 **5 mL**
5. 連接新的10 mL 針筒
6. 採血
7. 消毒無針連接器銜接孔或導管銜接孔 **5-15秒** (使用適當消毒劑 如chlorhexidine, povidone iodine, 或70% alcohol, 請務必注意, 若後續換藥施加敷料覆蓋前, 應待消毒液體完全乾燥)
8. 採血後以 **20 mL N/S** 脈動式沖洗管路, 及適當清潔導管及任何附加裝置

閉管

1. 停止使用時及施打藥物並完成最後沖洗之後，務必進行**正壓閉管**，保留0.5ml NS(勿全部推注完)以大拇指壓住針筒活塞後，接著關閉閥夾後再移除注射器，避免血液回流入導管內¹
2. N/S使用，請依醫院程序及注意事項

文獻出處：

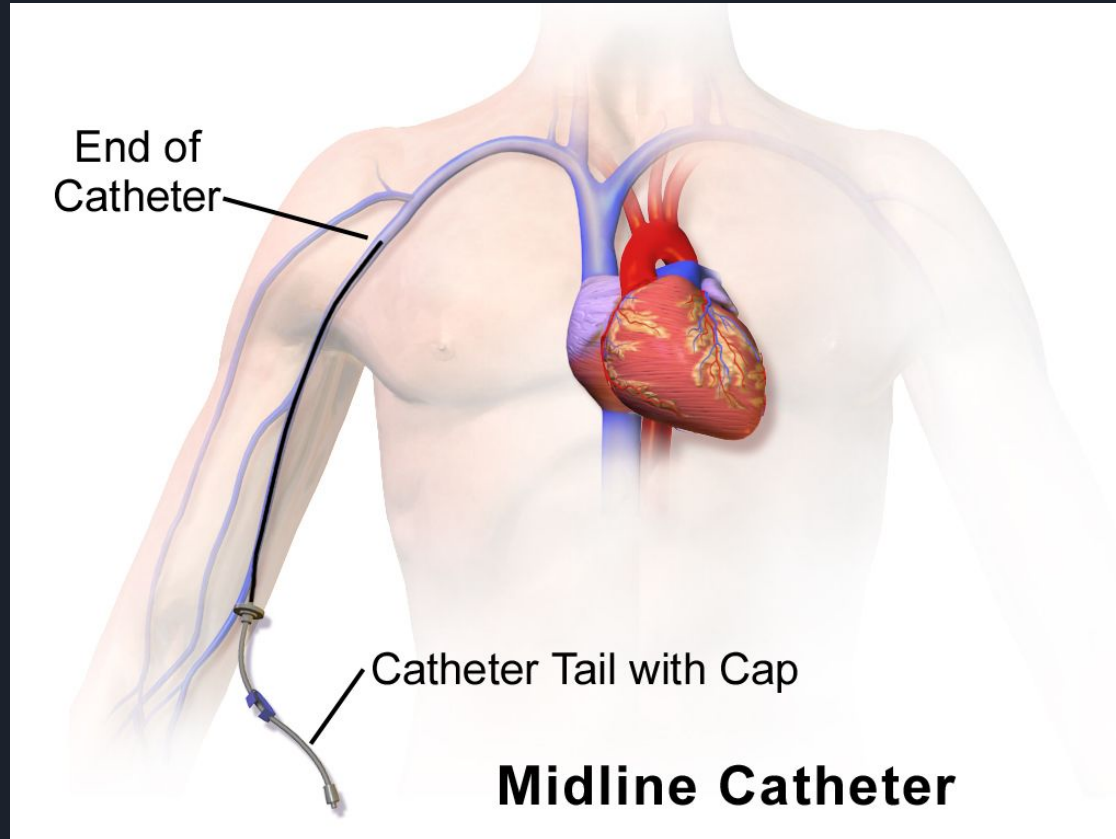
1. Gorski LA, Hadaway L, Hagle ME, et al. Infusion therapy standards of practice. J Infus Nurs. 2021;44(suppl 1):S1-S224. doi:10.1097/NAN.0000000000000396



健保給付規範

- 癌症化學治療及癌症末期之疼痛治療。
- 下列三項適應症且預期同時治療達二週以上之病人：
 - 使用全靜脈營養輸液 (TPN)(1歲以下嬰兒本項為靜脈營養輸液, 不限 TPN)
 - 免疫不全與使用免疫抑制劑
 - 須接受中心靜脈導管置入 (CVC)

What is Midline Catheter





ELSEVIER

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

American Journal of Infection Control

journal homepage: www.ajicjournal.org



Major Article

Midline or long peripheral catheters in difficult venous access conditions? A comparative study in patients with acute cardiovascular diseases

Adam Fabiani MSN, RN ^a, Valentina Eletto CNS, RN ^a, Lorella Dreas MD ^a, Daria Beltrame CNO, RN ^a,
Gianfranco Sanson PhD, RN ^{b,*}

- 8/10 cm long peripheral catheter (LPC)
- 18 cm long peripheral catheter
- 20 cm trimmed PICC catheter as Midline catheter (MC)

MCs allow for longer uncomplicated indwelling times than LPCs

Significant increase in CRC risk for 8/10 cm LPCs compared to MCs



Safety and efficacy of vasopressor administration through midline catheters

Nivedita Prasanna M.D.^a  , David Yamane M.D.^a, Naeha Haridasa B.A.^b,
Danielle Davison M.D.^a, Andrew Sparks M.S.^b, Katrina Hawkins M.D.^a

- A total of 248 patients received vasopressors via midline catheters

There were no complications related to ineffective drug delivery or limb endangerment.



Reference

- <https://ian-tsai.blogspot.com/2020/05/peripheral-or-central-venous-catheter.html>
- <https://www.acpjournals.org/doi/10.7326/M15-0744>