Fondazione IRCCS
San Gerardo dei Tintori

CATETERE VENOSO CENTRALE TUNNELLIZZATO

Beatrice Riboldi
dirigente medico
Unità Operativa di Nefrologia
IRCCS San Gerardo – Monza

08.10.2026

SCELTA DELL'ACCESSO IN EMODIALISI – *come scegliere*



FISTULA FIRST

1. **FISTOLA ARTERO-VENOSA** (durata elevata, basso rischio infettivo, alta efficacia)
2. **PROTESI ARTERO-VENOSA** (alternativa se FAV non confezionabile)
3. **CATETERE VENOSO CENTRALE TUNNELLIZZATO** (se non eseguibile accesso nativo/protesico o necessità di utilizzo rapido)
4. **CATETERE VENOSO CENTRALE TEMPORANEO** (utilizzo in urgenza)

GEMAV 2017, rev. 2025

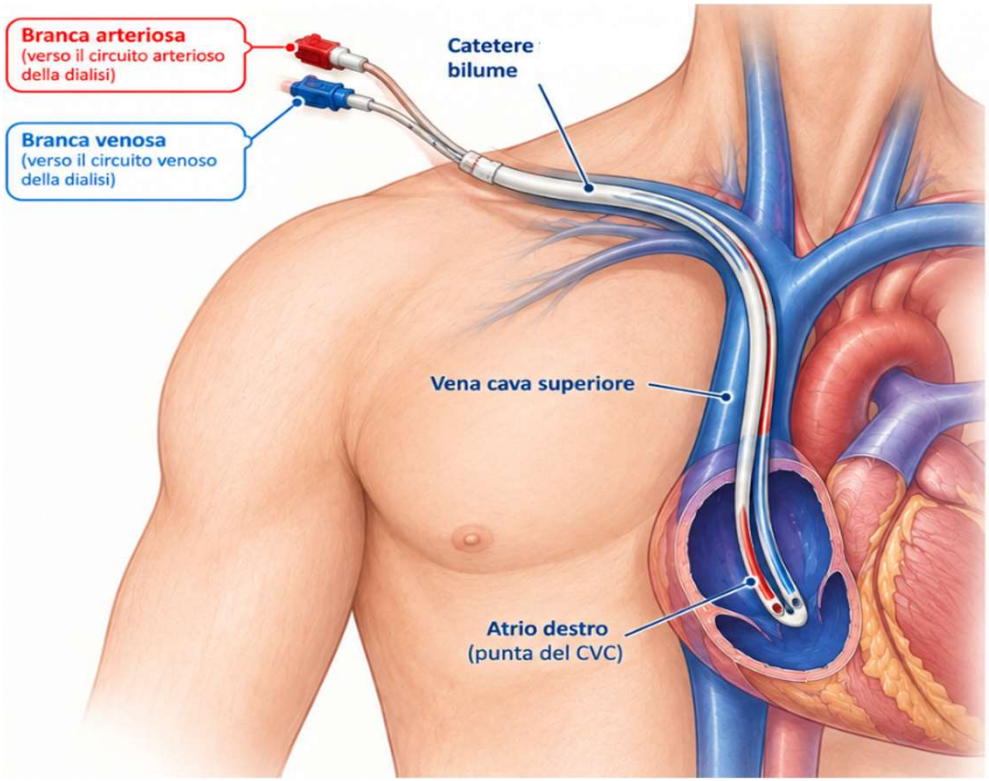


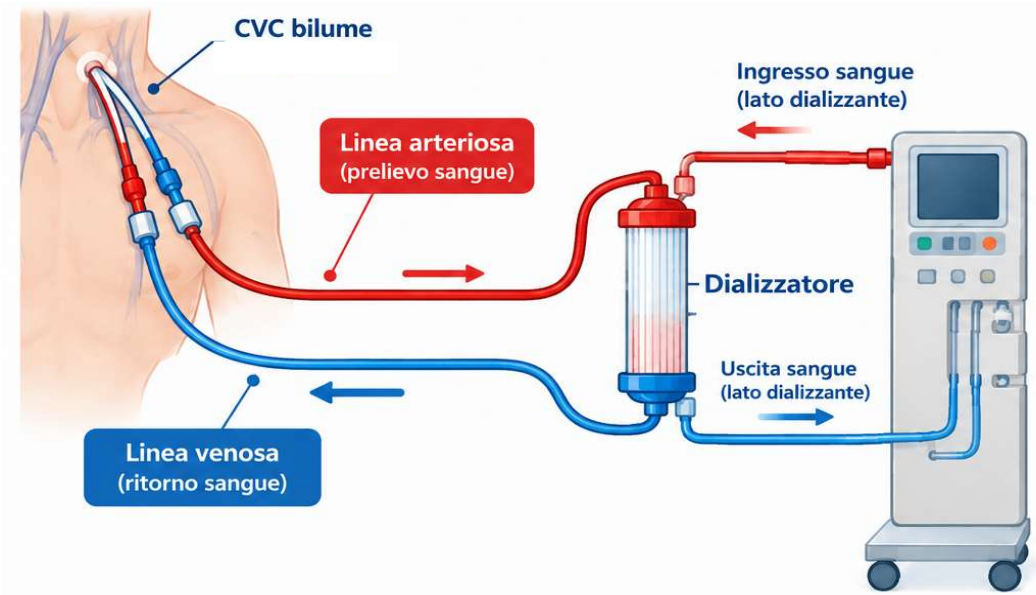
ESKD LIFE-PLAN

- **anatomia vascolare**
- **accessi vascolari precedenti**
- **prospettiva di vita**
- **comorbidità**
- **preferenza**

KDOQI, 2019

CATETERE VENOSO CENTRALE - *di cosa si tratta*



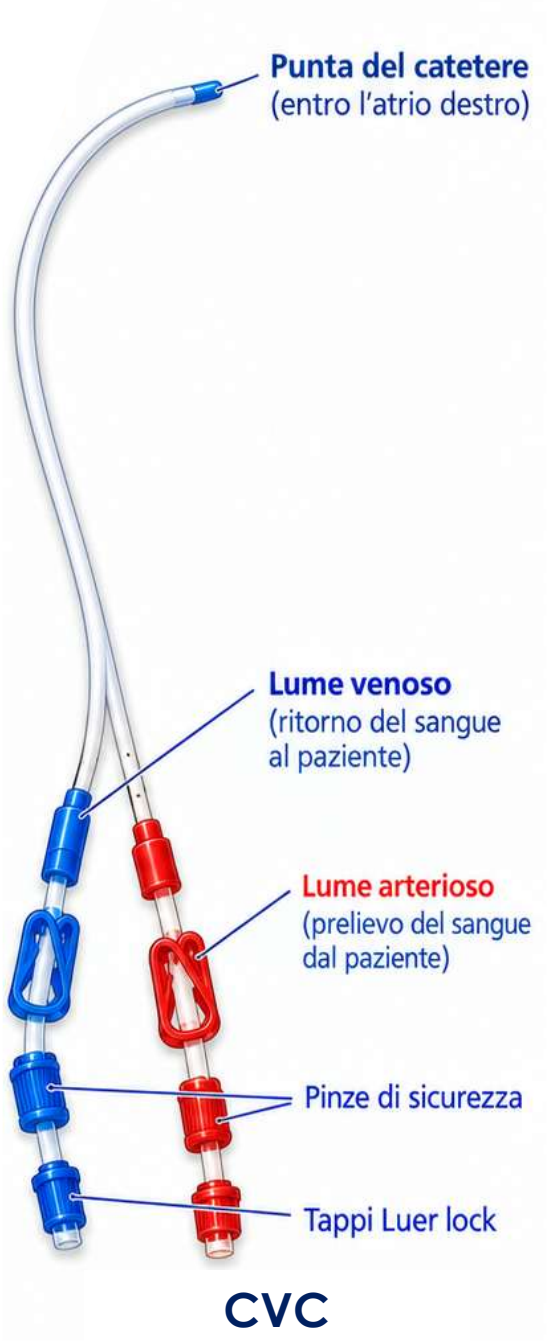


Flusso sangue (Qb)
300 – 330
ml/min

Pressione arteriosa
(pre-pompa)
-100 a -220
mmHg

Pressione venosa
(post-dializzatore)
100 a 220
mmHg

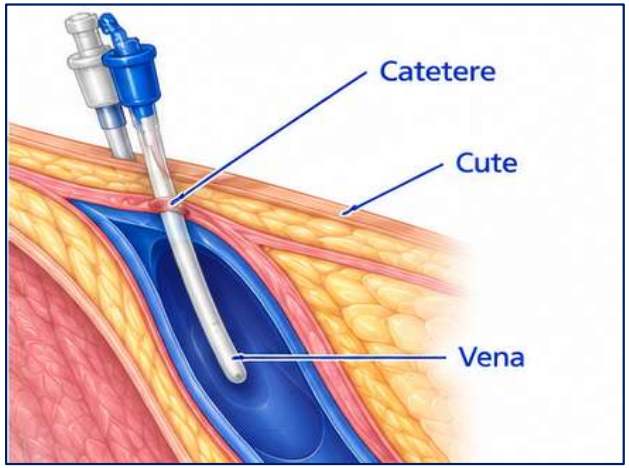
CATETERE VENOSO CENTRALE – *temporaneo vs tunnellizzato*



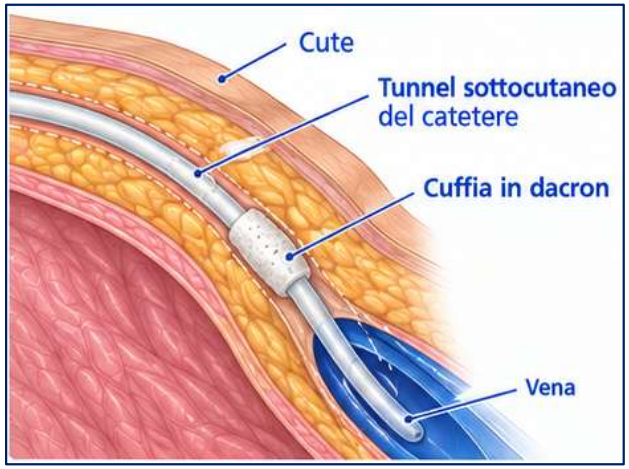
CVC temporaneo



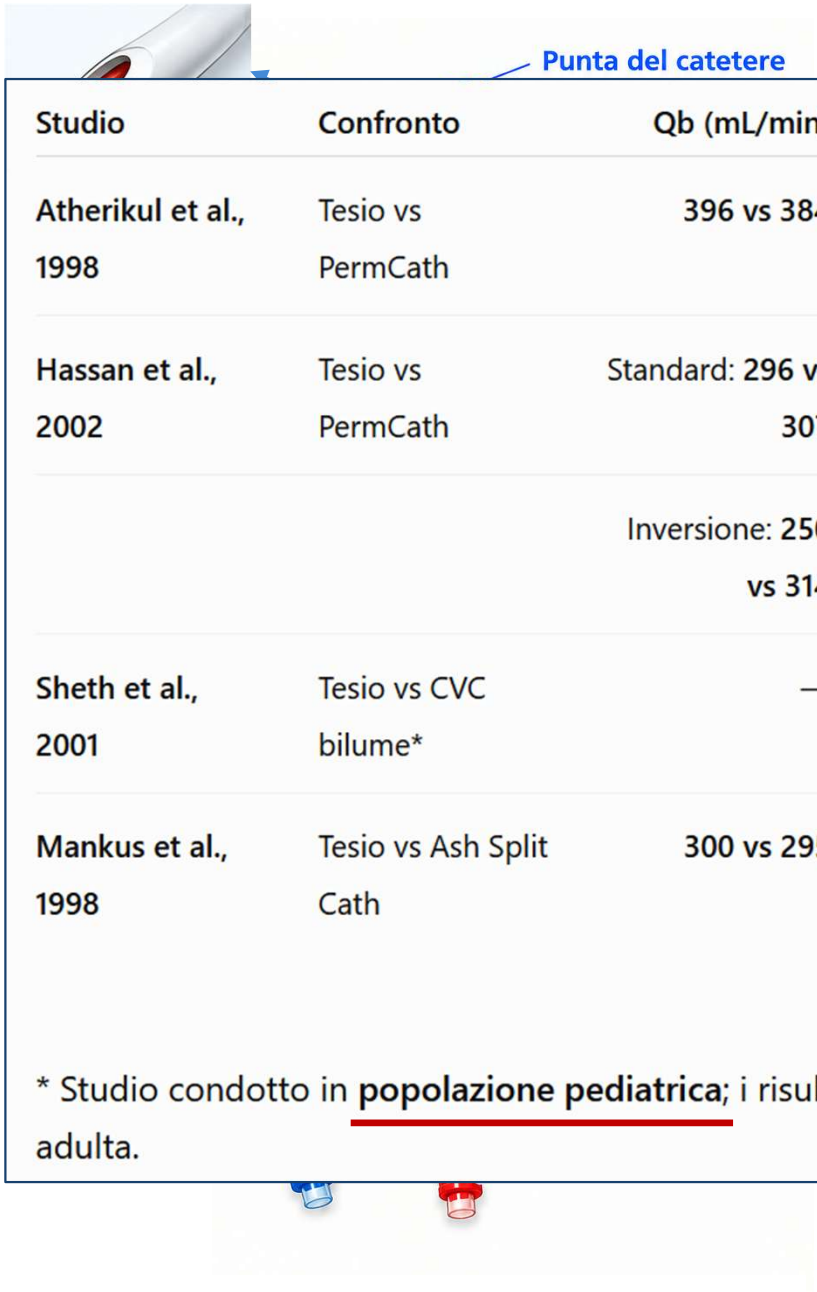
CVC tunnellizzato



2-3 settimane



CATETERE VENOSO CENTRALE TUNNELLIZZATO – *geometria e struttura*



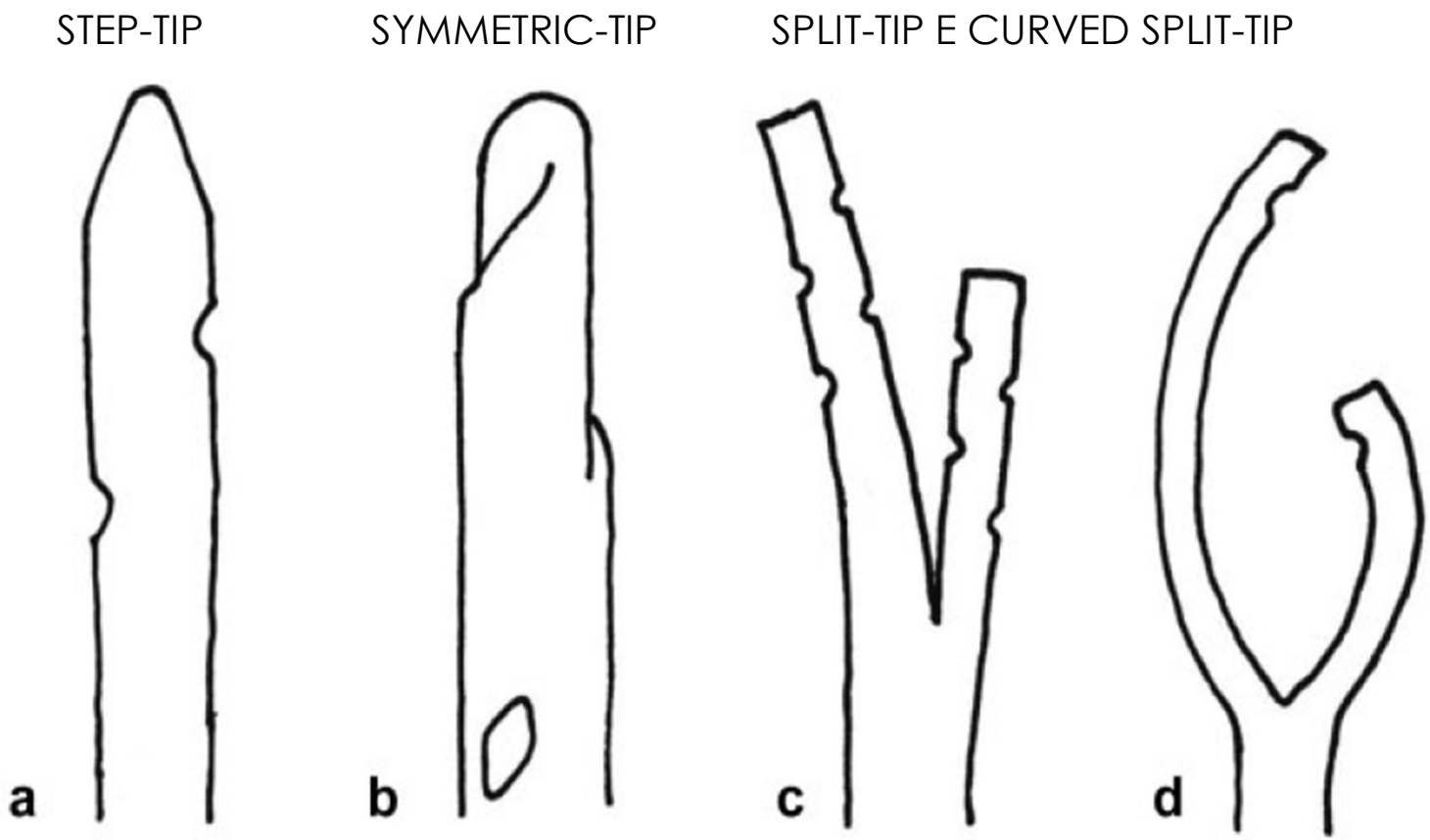
Studio	Confronto	Qb (mL/min)	Ricircolo	Kt/V / clearance	Principale risultato
Atherikul et al., 1998	Tesio vs PermCath	**396 vs 384**	**3,9% vs 3,7%**	Kt/V **1,44 vs 1,42**	Prestazioni dialitiche sovrapponibili
Hassan et al., 2002	Tesio vs PermCath	Standard: **296 vs 307**	Standard: **2,8% vs 2,5%**	—	In condizioni standard, risultati simili
		Inversione: **250 vs 314**	Inversione: **3,8% vs 12%**	BUN clearance Tesio: **247 → 216**	**Differente comportamento con inversione dei lumi**
Sheth et al., 2001	Tesio vs CVC bilume*	—	—	Kt/V >1,2: **76% vs 57%**	Sopravvivenza a 1 anno: **46% vs 0%**
Mankus et al., 1998	Tesio vs Ash Split Cath	**300 vs 295**	—	—	Qb simile; differenza non significativa nella resistenza idraulica

* Studio condotto in **popolazione pediatrica**; i risultati non sono direttamente estrapolabili alla popolazione adulta.

CVC tunnellizzato bilume

CVC tunnellizzati gemelli

CATETERE VENOSO CENTRALE TUNNELLIZZATO – *geometria e struttura*



Hemodialysis Catheters: Update on Types, Outcomes, Designs and Complications. ***Seminars in Interventional Radiology, 2022***

CATETERE VENOSO CENTRALE TUNNELLIZZATO – *inserzione e lunghezza*

VENA GIUGULARE INTERNA

↓

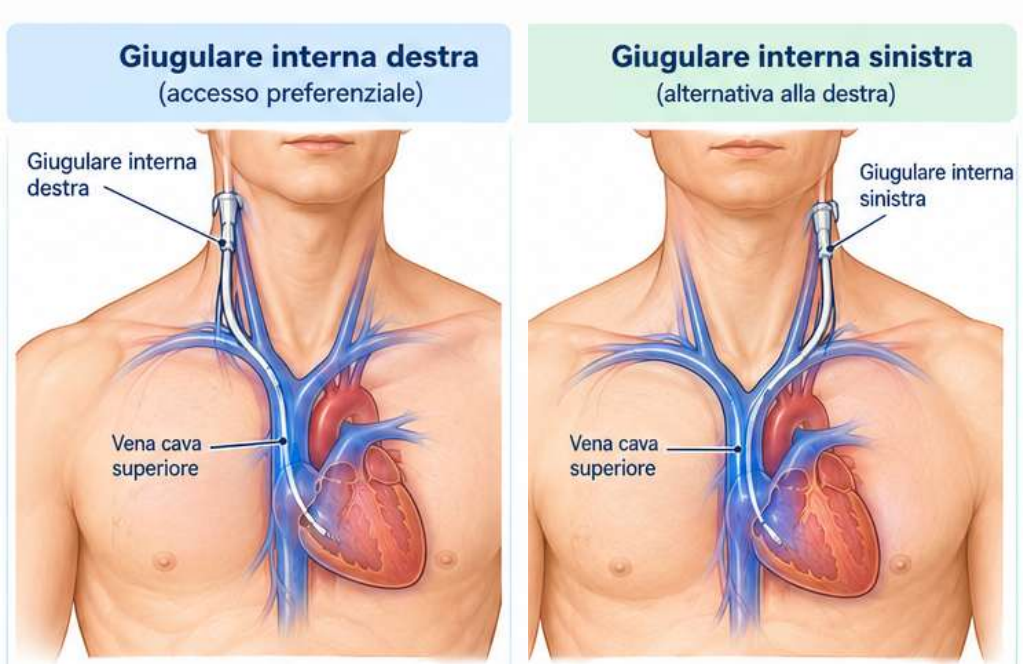
VENA BRACHIOCEFALICA

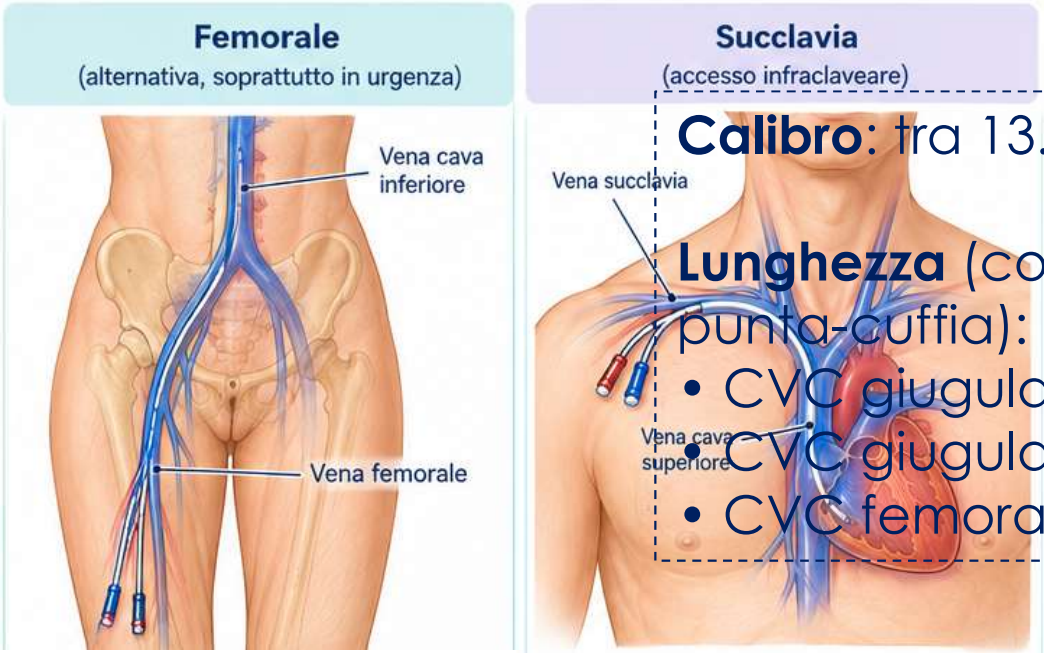
↓

VENA CAVA SUPERIORE

↓

MEDIO ATRIO DX





Calibro: tra 13.5 e 15.5 Fr

Lunghezza (come distanza punta-cuffia):

- CVC giugulare dx→19-24 cm
- CVC giugulare sn→ 27-31 cm
- CVC femorale→ ≥ 32 cm

CATETERE VENOSO CENTRALE TUNNELLIZZATO – *indicazioni*



Statements: Central Venous Catheters (CVC): Indications for Use

2.2 KDOQI considers it reasonable in valid clinical circumstances to use tunneled CVCs for short-term or long-term durations for incident patients, as follows *(Expert Opinion)*:

Short-term duration:

- **AVF or AVG created but not ready for use and dialysis is required**
- **Acute transplant rejection or other complications requiring dialysis**
- **PD patient with complications that require time-limited peritoneal rest or resolution of complication (eg, pleural leak)**
- **Patient has a living donor transplant confirmed with an operation date in the near future (eg, < 90 days) but requires dialysis**
- **AVF or AVG complication such as major infiltration injury or cellulitis that results in temporary nonuse until problem is resolved**

Note: In special, limited circumstances where temporary CVC is required to manage a vascular access complication (eg, <2 weeks), it may be acceptable to use a nontunneled CVC.

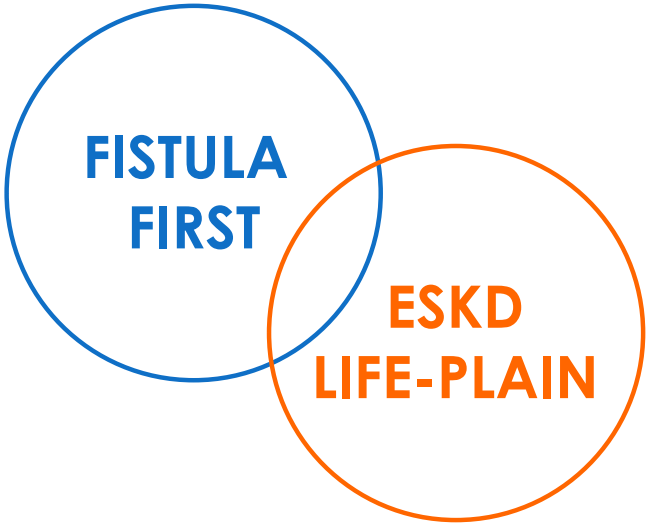
KDOQI suggests that most incident HD patients starting dialysis with a CVC should convert to either an AVF or AVG, if possible, to reduce their risk of infection/bacteremia, infection-related hospitalizations, and adverse consequences.

Long-term or indefinite duration:

- **Multiple prior failed AV accesses with no available options (see anatomic restrictions below)**
- **Valid patient preference whereby use of an AV access would severely limit QOL or achievement of life goals and after the patient has been properly informed of patient-specific risks and benefits of other potential and reasonable access options for that patient (if available)**
- **Limited life expectancy**
- **Absence of AV access creation options due to a combination of inflow artery and outflow vein problems (eg, severe arterial occlusive disease, noncorrectable central venous outflow occlusion) or in infants/children with prohibitively diminutive vessels**
- **Special medical circumstances**

KDOQI 2019

CATETERE VENOSO CENTRALE TUNNELLIZZATO



FISTOLA ARTERO-VENOSA

Guideline 8: Clinical Outcome Goals

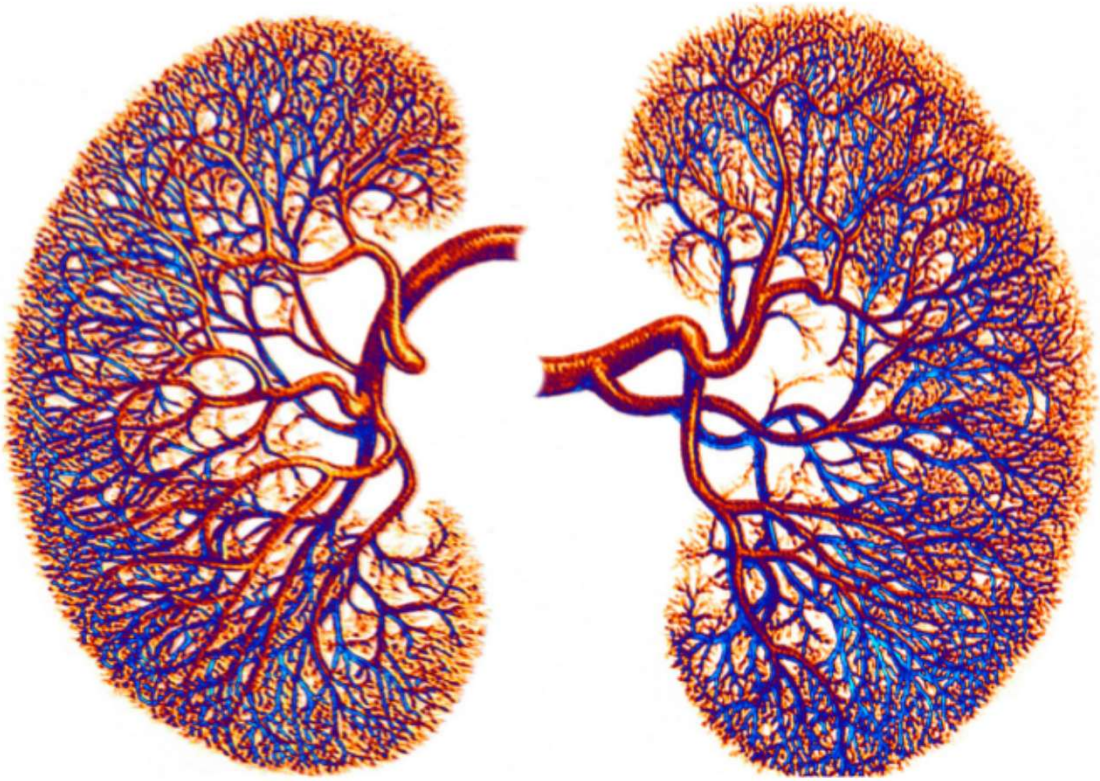
- An institution should aim to have >65% of its patients with a functioning fistula, and <10% of its patients using cuffed catheters for permanent dialysis access.

KDOQI 2006

Percentage of prevalent patients in HD programme for more than 3 months who, on 31 December of the study year, are being dialysed through a tunnelled central venous catheter

- *Numerator:* number of patients in HD programme being dialysed through a Tunnelled CVC (TCVT) on 31 December of the study year × 100.
- *Denominator:* number of patients in a HD programme for more than 3 months on 31 December of the year in progress.
- *Units:* percentage.
- *Periodicity:* annual.
- *Standard:* ≤ 20%.

GEMAV 2017, rev. 2025



GRAZIE PER L'ATTENZIONE

BIBLIOGRAFIA

- *Spanish Multidisciplinary Group on Vascular Access (GEMAV), Spanish Clinical Guidelines on Vascular Access for Haemodialysis. 2017 (revisione2025)*
- *Lok CE, Huber TS, Lee T, et al. KDOQI clinical practice guideline for vascular access 2019 update. Am J Kidney Dis. 2019*
- *Schmidli J, Widmer MK, Basile C, et al. Editor's Choice e Vascular Access: 2018 Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS)*
- *Sohail MA, Vachharajani TJ, Anvari E. Central Venous Catheters for Hemodialysis-the Myth and the Evidence. Kidney Int Reports. 2021*
- *Khudari H El, Almehmi A, Kowalczyk B, Bassuner J. Hemodialysis Catheters: Update on Types , Outcomes , Designs and Complications. 2022*
- *Silverstein DM, Trerotola SO, Clark T, et al. Clinical and Regulatory Considerations for Central Venous Catheters for Hemodialysis. 2018*
- *Atherikul K, Schwab SJ, Conlon PJ. Adequacy of haemodialysis with cuffed central-vein catheters. Nephrology Dialysis Transplantation. 1998*
- *Hassan HA, Frenchie DL, Bastani B. Effect of reversal of catheter ports on recirculation: comparison of the PermCath with Tesio Twin Catheter. ASAIO Journal. 2002*
- *Sheth RD, Kale AS, Brewer ED, Brandt ML, Nuchtern JG, Goldstein SL. Successful use of Tesio catheters in pediatric patients receiving chronic hemodialysis. American Journal of Kidney Diseases. 2001*
- *Mankus RA, Ash SR, Sutton JM. Comparison of blood flow rates and hydraulic resistance between the Mahurkar catheter, the Tesio twin catheter, and the Ash Split Cath. ASAIO Journal. 1998*