Feasibility and Need for a Robust Dialysis Access Program in Ghana: Insights from the International Healthcare Volunteers (IHCV) Mission at Cape Coast Teaching Hospital

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Background

End-stage renal disease (ESRD) affects an estimated 4.6 million people worldwide, with annual mortality rates ranging from 5% to 27% among treated patients. Ghana, a lower-middle-income country, has a high burden of ESRD but limited treatment availability, with only 23.6 per million population (pmp) on renal replacement therapy compared to 2,436.1 pmp in the United States. This stark discrepancy highlights the impact of health system capacity, workforce shortages, and restricted access to care on treatment options.

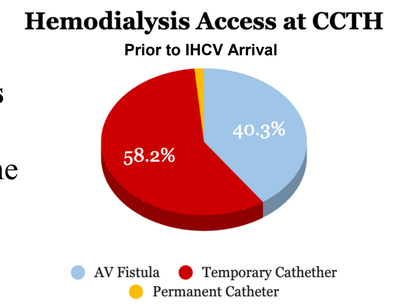
Hemodialysis is the primary treatment modality for ESRD and requires reliable vascular access, either through a catheter or a surgically created arteriovenous fistula (AVF). While temporary catheters are often used initially, they are associated with higher rates of sepsis and mortality compared to AV fistulas.

Despite global recommendations prioritizing autogenous arteriovenous fistulas as the preferred vascular access for hemodialysis, resource and training limitations have hindered their widespread adoption across Ghana.

The International Healthcare Volunteers (IHCV) conducted a two-week surgical mission at Cape Coast Teaching Hospital (CCTH) in Cape Coast, Ghana to treat patients, train providers, and track data to improve outcomes and strengthen the local healthcare system.

Hemodialysis Access at CCTH

Prior to the IHCV team's involvement, **58.2% of dialysis patients depended on temporary catheter access**, The majority had maintained this form of access for at least three months.



Methods

Patients on hemodialysis with temporary catheters were screened for permanent vascular access creation.

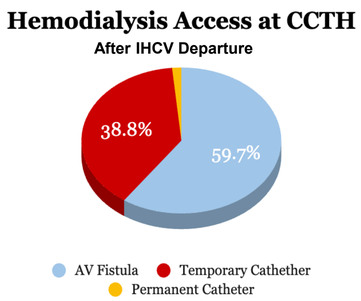
Eligibility criteria included:

- On hemodialysis with a temporary catheter
- Venous diameter ≥ 2.5 mm and arterial diameter ≥ 2 mm
- Medically cleared for surgery
- Have a designated blood donor to receive blood from the hospital blood bank

Patients meeting criteria underwent ultrasound vessel mapping, preoperative evaluation, and surgical creation of arteriovenous fistulas (AVFs) as resources allowed. Data was collected on patient demographics, vascular anatomy, and logistical barriers encountered during the mission.

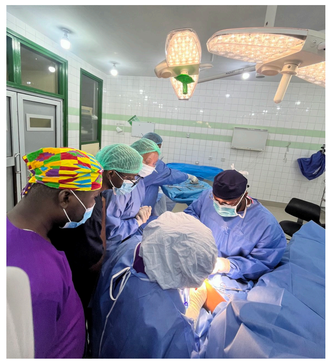
Results

13 patients underwent successful AVF creation, six brachiocephalic and seven basilic vein transpositions leading to a **19.4% reduction of temporary catheter use for HD at CCTH in two weeks.**



Surgical residents and nurses:

- Observed and/or assisted in vascular procedures
- Gained experience in preoperative evaluation and management of postoperative complications
- Received education on proper cannulation technique



Discussion

This mission highlighted multiple systemic and clinical barriers to dialysis access creation in Ghana.

Key challenges included:

- Limited workforce with expertise in vascular access
- Widespread chronic anemia & electrolyte imbalances
- Equipment shortages restricting the number of procedures
- The requirement for patients to identify a replacement blood donor prior to transfusion
- Logistical difficulties in preoperative optimization and postoperative follow-up

Despite these constraints, this initiative demonstrates the feasibility and urgent need for a structured national dialysis access program in Ghana. Strengthening local surgical training and nursing education can expand access to durable arteriovenous fistulas and reduce dependence on temporary catheters. With coordinated resource allocation and sustained collaboration, reliable and sustainable vascular access for patients with end-stage renal disease is achievable.

The IHCV model highlights how international collaboration with local teams can bridge infrastructure gaps and transition dialysis care toward global best practices.

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References

Tannor, E. K., & Antwi, S. (2023). Global Dialysis Perspective: Ghana. Kidney360, 4(12), 1776–1779. https://doi.org/10.34067/KID.0000000000000272

Tannor EK, Hutton-Mensah K, Opare-Addo P, et al. Fifty years of hemodialysis in Ghana-current status, utilization and cost of dialysis services. BMC Health Serv Res. 2023;23(1):1170. Published 2023 Oct 27. doi:10.1186/s12913-023-10154-x

Stel VS, Boenink R, Astley ME, et al. A comparison of the epidemiology of kidney replacement therapy between Europe and the United States: 2021 data of the ERA Registry and the USRDS. Nephrol Dial Transplant. 2024;39(10):1593-1603. doi:10.1093/ndt/gfae040

Boima, V., Tannor, E. K., Osafo, C., Awuku, Y. A., Mate-Kole, M., Davids, M. R., & Adu, D. (2021). The Ghana Renal Registry–a first annual report. African Journal of Nephrology, 24(1), 19-24.

Ortiz A, Covic A, Fliser D, et al. Epidemiology, contributors to, and clinical trials of mortality risk in chronic kidney failure. Lancet. 2014;383(9931):1831-1843. doi:10.1016/S0140-6736(14)60384-6