Uganda

- Adolescents' perspectives on health literacy interventions for reducing epilepsy misconceptions and stigma, and enhancing epilepsy management in Uganda
- Multinational Attitudes Toward AI in Health Care and Diagnostics Among Hospital Patients
- GLAPAL-H: Global, Local, And Parts Aware Learner for Hydrocephalus Infection Diagnosis in Low-Field MRI
- Poor surgical outcomes following Paenibacillus infant infectious hydrocephalus
- Constructing a Digital Bridge: A Systematic Review Assessing Electronic Medical Record and Telehealth Implementation for Neurosurgery in Uganda
- Five-year outcomes after surgical treatment of infant postinfectious hydrocephalus in sub-Saharan Africa: results of a randomized trial
- Preconception and Prenatal Environment and Growth Faltering Among Children in Uganda
- Single piece craniotomy in the management of a patient with large vertex epidural haematoma and deteriorating brain function in a limited resources community. Case report from Southwestern Uganda

Neurosurgery in Uganda has experienced significant advancements in recent years, marked by the establishment of specialized institutions and the training of local experts.

Specialized Institutions

- **CURE Children's Hospital of Uganda (CCHU):** Located in Mbale, CCHU is a leading pediatric neurosurgery hospital in Africa. Since its opening in 2000, it has performed over 1,500 surgeries annually, focusing on conditions like hydrocephalus, spina bifida, and brain tumors. The hospital also offers training programs, including the International Program to Advance the Treatment of Hydrocephalus (iPATH), which educates resident doctors in advanced neurosurgical procedures.

Approximately 770,000 people in Uganda are affected by epilepsy. Drug-resistant epilepsy affects approximately 30%-40% of patients with epilepsy, and one-third of these patients may be eligible for surgical management. This article describes the formation of an epilepsy monitoring unit in Uganda as the first step toward establishing a surgical epilepsy program for pediatric patients. A hybrid remote and in-person collaborative model was developed between teams in Mbale and Kampala in Uganda and Chicago in the US. The authors describe a process that spanned 2 years (2021-2023) for developing readiness for referrals for pediatric epilepsy surgery candidates in Uganda [1)].

- **Kisubi Hospital:** Situated in Wakiso District, Kisubi Hospital is a private, non-profit community hospital offering specialized services such as neurosurgery. The facility includes three operating rooms and a four-bed intensive care unit, providing comprehensive care to the surrounding communities.

- **Kampala Hospital:** As a private healthcare facility in Kampala, Kampala Hospital was the first in Uganda to install a Magnetic Resonance Imaging (MRI) machine and a CT Scanner. It offers various specialty services, including neurosurgery, and continues to expand its capabilities to meet the growing healthcare demands.

- **International Specialized Hospital of Uganda (ISHU):** Currently under construction in Lubowa, Wakiso District, ISHU is a public-private partnership aimed at reducing the need for Ugandans to seek specialized medical care abroad. The hospital will offer advanced neurosurgical services and is expected to be completed in 2025.

Notable Neurosurgeons

- **Dr. Juliet Sekabunga Nalwanga:** Uganda's first female neurosurgeon, Dr. Nalwanga, has significantly contributed to the field. After completing her training at Mbarara University and Makerere University, she specialized in pediatric neurosurgery at the University of Toronto. She currently serves as a consultant pediatric neurosurgeon at Mulago National Referral Hospital and as an assistant lecturer at Makerere University School of Medicine.

Challenges and Future Outlook

Despite these advancements, challenges such as a limited number of neurosurgeons and inadequate infrastructure persist. Continued investment in training programs and healthcare infrastructure is essential to further enhance neurosurgical services in Uganda.

In summary, Uganda has made notable progress in neurosurgery through the development of specialized hospitals and the training of dedicated professionals. Ongoing efforts are crucial to address existing challenges and ensure accessible neurosurgical care for all Ugandans.☹

In a study of 5219 individuals 0 to 59 months of age in Uganda, rainfall and long-term availability of water at preconception and during gestation were positively associated with nutritional child growth outcomes. Understanding the relative contributions of meteorological environment factors on the spatial distribution of undernutrition at various spatial scales within Uganda (from the village to the district level) may help in the design of more cost-effective delivery of precision public health programs [2)]

A study aimed to determine the feasibility of rural trauma team training amongst medical trainees and traffic law enforcement professionals in Uganda.

A Prospective multi-center interrupted time series analysis of an interventional training based on the 4th edition of rural trauma team development course of the American College of Surgeons. Trauma-related multiple choice questions (MCQs), and trauma non-technical skills were assessed pre-and post-training between September 2019- August 2023. Acceptability of the training for promulgation to other rural regions and its relevance to participants' work needs were evaluated on 5- and 3-point Likert scales respectively. The median MCQ scores (IQR) were compared before and after training at 95% CI, regarding $p < 0.05$ as statistically significant. Triangulation with open-ended questions was obtained. Time series regression models were applied to test for autocorrelation in performance using Stata 15.0. Ethical approval was obtained from the Uganda National Council for Science and Technology (Ref: SS 5082).

A total of 500 participants including 66 (13.2%) traffic police officers, 30 (6.0%) intern doctors, 140 (28.0%) fifth-year, and 264 (52.8%) third-year medical students were trained. Among the 434 medical trainees who completed the trauma-based MCQ assessment, the median pre-and post-test scores were 60%, IQR (50-65) and 80%, IQR (70-85) respectively. Overall, the mean difference between pre- and post-test scores was statistically significant (z = 16.7%, P|z|=<0.0001). Most participants strongly agreed to promulgate 389 (77.8%), relevance to their educational 405 (81.0%), and work needs 399 (79.8%). Each of the course components was rated above 76.0% as being very relevant. There was an overall increment in median (IQR) trauma-nontechnical skills team performance scores from 12 (9-14) to 17 (15-20) after the training ($p < 0.001$), with police teams advancing from 9.5 (6.0-12.5) to 19.5 (17.0-21.5) ($p < 0.001$).

This study demonstrates that rural trauma team development training had a positive effect on the test scores of course participants. The training is feasible, highly acceptable and regarded as relevant amongst medical trainees and traffic law enforcement professionals who provide first-aid to trauma patients in resource-limited settings. The findings could inform the design of future trauma teams in rural communities.

Trial registration: Retrospective registration (UIN: researchregistry9450) [3].

In the 2000s, neurosurgery in Uganda experienced increasing surgical volume and a new residency training program. While research has examined surgical capacity, minimal data exists on the patient population treated by neurosurgery and their eventual outcomes in sub-Saharan Africa.

Patients admitted to Department of Neurosurgery, Mulago National Referral Hospital, Kampala, Uganda were documented in a prospective database. 1167 were discharged with documented phone numbers, thus eligible for follow-up. Phone surveys were developed and conducted in the participant's language to assess mortality, neurological outcomes, and follow-up healthcare.

During the study period, 2032 patients were admitted to the neurosurgical ward, 80% for traumatic brain injury. 7.8% received surgical intervention. The in-Hospital mortality rate was 18%. 870 patients were reached for phone follow-up, a 75% response rate. 30-day and 1-year mortality was 4% and 8%, respectively. Almost half of patients had not had subsequent healthcare after the initial encounter. Most patients had GOS-E scores consistent with good recovery and mild disability - trauma patients faring best and tumor patients faring worst. 85% felt they returned to baseline work performance, and 76% of guardians felt that children returned to baseline school performance.

The neurosurgical service provided healthcare to a large proportion of non-operative patients. Phone surveys captured data on patients where nearly half would be lost to subsequent healthcare. While mortality during initial hospitalization was high, over 90% of those discharged survived at 1 year follow up, and the vast majority returned to work and school [4].

Neonatal infection is the most common cause of infant hydrocephalus in Uganda. Postinfectious hydrocephalus (PIH) is often accompanied by primary brain injury from the original infection. Since 2001, ETV (with or without choroid plexus cauterization) has been the primary treatment for PIH.

Warf et al. studied the 5-year outcome in a cohort of 149 infants treated for PIH from 2001 to 2005 and who lived in 4 districts close to the hospital. Survival analysis was performed using the Kaplan-Meier method. Statistical significance was determined using the Fisher, Breslow, and log-rank tests.

The patients' mean age at presentation was 9.5 months (median 3.0 months). Eighty-four patients (56.4%) were successfully treated without a shunt. Operative mortality was 1.2% for ETV and 4.4% for shunt placement (p = 0.3). Five-year survival was 72.8% in the non-shunt-treated group and 67.6% in the shunt-treated group, with no difference in survival (log rank p = 0.43, Breslow p = 0.46). Of 43 survivors assessed at 5-11 years, those with shunts had significantly worse functional outcomes (p = 0.003-0.035), probably reflecting treatment selection bias since those with the worst sequelae of ventriculitis were more likely to be treated with shunt placement.

Nearly one-third of treated infants died within 5 years, and at least one-third of the survivors were severely disabled. There was no survival advantage for non-shunt-treated patients at 5 years. A randomized trial of endoscopic third ventriculostomy versus shunt placement for treating PIH may be indicated. Public health measures that prevent these infections are urgently needed [5].

1)
Wegoye E, Bieber D, Khisa S, Moskalyk K, Mutonyi B, Nantongo B, Idro R, Vicenteno M, Padilla E, Abdelmageed S, Garcia RM, Sebunya R, Okechi H, Widjaja E, Lam S. Bridging the gaps in the setup of a functional epilepsy monitoring unit in Uganda to support epilepsy surgery. Neurosurg Focus. 2025 Mar 1;58(3):E7. doi: 10.3171/2024.12.FOCUS24808. PMID: 40022750.
2)
Ssentongo P, Fronterre C, Ericson JE, Wang M, Al-Shaar L, Greatrex H, Omadi PO, Muvawala J, Greybush SJ, Mbabazi PK, Murray-Kolb LE, Muwanguzi AJB, Schiff SJ. Preconception and Prenatal Environment and Growth Faltering Among Children in Uganda. JAMA Netw Open. 2025 Mar 3;8(3):e251122. doi: 10.1001/jamanetworkopen.2025.1122. PMID: 40105840.
3)
Lule H, Mugerwa M, Ssebuufu R, Kyamanywa P, Posti JP, Wilson ML. Prospective multi-centre analysis of rural trauma team development training for medical trainees and traffic law enforcement professionals in Uganda: an interrupted time series study. BMC Med Educ. 2025 Jan 29;25(1):148. doi: 10.1186/s12909-025-06755-1. PMID: 39881413; PMCID: PMC11780836.
4)
Xu LW, Vaca SD, Nalwanga J, Muhumuza C, Vail D, Lerman BJ, Kiryabwire Surg J, Ssenyonjo H, Mukasa J, Muhumuza M, Haglund MM, Grant G. Life After the Neurosurgical Ward in SubSaharan Africa: Neurosurgical Treatment and Outpatient Outcomes in Uganda. World Neurosurg. 2018 Feb 7. pii: S1878-8750(18)30247-X. doi: 10.1016/j.wneu.2018.01.204. [Epub ahead of print] PubMed PMID: 29427813.
5)
Warf BC, Dagi AR, Kaaya BN, Schiff SJ. Five-year survival and outcome of treatment for postinfectious hydrocephalus in Ugandan infants. J Neurosurg Pediatr. 2011 Nov;8(5):502-8. doi: 10.3171/2011.8.PEDS11221. PubMed PMID: 22044377.