



Pre-Medicine Internship Program

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Resilience Across Borders: A Journey Through Kenyan Healthcare

From a young age, I became acutely aware of the challenges of living with illness. As a child, I struggled with severe atopic eczema, which not only affected me physically, but also made me confront the emotional weight of managing chronic conditions. At sixteen, I was diagnosed with keratoconus, a progressive eye condition that causes the cornea to thin and change shape, leading to blurred vision. The exact cause of keratoconus remains uncertain, with both genetic and environmental factors implicated; in my case it was suspected that repetitive eye rubbing due to chronic eczema contributed to the disease. Undergoing treatment to halt its progression was a formative experience - one that first drew my curiosity toward medicine. I found myself deeply interested in how diseases could arise from different etiologies yet converge in their pathophysiology, and I wanted to understand the mechanisms behind these connections.

During middle and high school, I poured much of my energy into lifesaving sport. The hours I spent training instilled in me discipline, initiative, and a readiness to step into leadership roles, particularly when preparing for basic life support scenarios. These experiences taught me the value of teamwork, responsibility, and the calm required in moments of urgency. Together, my medical history and my training gave me a glimpse into what a career in healthcare might involve. Still, at that time, they remained more as inspirations than convictions; while they sparked my curiosity and admiration for medicine, I had not yet fully envisioned myself taking on the immense responsibility of caring for patients in a clinical setting.

That perspective changed profoundly through my internship experience with International Medical Aid in East Africa, which became one of the most transformative opportunities of my life. Immersing myself in a healthcare system so different from the one I had known in Canada not only deepened my understanding of medicine, but also broadened my perspective on what it truly means to serve as a healthcare provider. I witnessed firsthand the resilience of patients who faced significant barriers to care, the ingenuity of clinicians working resourcefully with limited supplies, and the strength of community that was woven into daily life.

These experiences challenged me to think critically about global health disparities, the importance of cultural humility, and the values of empathy and gratitude in clinical practice. More importantly, they gave me a clear and undeniable sense of direction: I knew that I wanted to dedicate myself to medicine—not only to treat patients, but also to contribute to bridging systemic inequities in healthcare.

I invite you to follow along with my journey as I reflect on the knowledge and perspective I gained through this internship, and how these lessons will guide my path toward a career in healthcare.

During my first week, I rotated through the intensive care unit (ICU), a critical care environment dedicated to managing patients with acute, life-threatening organ dysfunction. In Canada, where I am from, the closed model of care — intensivist-led management has been shown to improve patient outcomes and adherence to quality indicators — is the standard (Mwangi et al., 2023). At Coast General Teaching and Referral Hospital (CGTRH), however, I experience a more open model (Mwangi et al., 2023). Although medical officers were designated in ICU, patient management was largely directed by surgeons and primary physicians in absence of intensivists. In conversations with staff, I was struck to learn that only one nurse in the unit had specialized in critical care. Beyond human resource challenges, equipment limitations also played a role: research has shown that nearly half of blood gas analysis machines in Kenya's public sector were reported non-functional, despite their essential role in monitoring conditions such as acute respiratory distress syndrome, which is frequently seen in critical patients (Mwangi et al., 2023). These systemic constraints were not abstract statistics — they had direct and visible consequences for the patients I encountered.

What left a lasting impression on me was encountering a case that had never happened in the hospital before. A 31-week pregnant woman with severe mitral stenosis, complicated by heart failure and pulmonary edema was admitted to the medical ICU following cardiology consultation. On the night prior to my observation, her oxygen saturation had dropped below 65%, and fetal distress was documented. At that time, the medical ICU lacked access to non-invasive oxygen delivery devices, and the blood gas analyzer was non-functional. Despite multiple indications for airway intervention, limited equipment and shortage of trained personnel led to deferral of intubation overnight.

When I arrived the following morning, the unit was in a state of urgency, with ongoing debate over whether to transfer the patient to the operating theatre. Given her critical status, disconnecting her from mechanical support for transfer was not feasible. She had already endured prolonged hypoxemia overnight, raising grave concern for hypoxic brain injury. Consequently, an emergency cesarean section was performed in the ICU — the first surgical operation undertaken in the hospital's history to be conducted in that setting, without standard infection-control infrastructure.

As no heart rate was detected on fetal assessment that morning, neonatal resuscitation with CPR was attempted but unsuccessful. After delivery, the mother experienced a period of profound hypotension, with persistently low perfusion pressures despite intensive resuscitative measure, before eventually stabilizing and surviving. This case illustrated both complexity of critical care in resource-limited settings and devastating consequences of systemic constraints.

Beyond observing systemic challenges, I also had the opportunity to gain direct exposure to critical care procedures including the central line. A patient who presented with hepatic encephalopathy in the setting of hepatic, hypovolemic, and septic shock, likely secondary to chronic alcohol use and underlying liver cirrhosis. The patient suffered cardiac arrest but was successfully resuscitated with CPR.

A central venous catheter (CVC) was then inserted to provide rapid access to a major central vein for administration of medications and fluid. Vasopressors such as adrenaline (epinephrine), dopamine, or norepinephrine were administered to restore adequate blood pressure and perfusion to vital organs by constricting blood vessels, as the patient remains in a state of shock. In addition, inotropes are considered when low cardiac output is present. The catheter was primed with heparinized saline to prevent clot formation. Triple lumen central line has three ports and learned that distal (blue) port provides the closest access to the right atrium, which is why it is used for vasoactive medication and central venous pressure monitoring. In this patient, CVC was inserted via the subclavian vein for palliative care, as this site offers longer-term access due to thicker surrounding soft tissue and carries a lower infection risk compared to femoral and internal jugular sites.

Aside from clinical learning, I also witnessed a case from mob justice. In Kenya, mob justice refers to the practice where community members collectively punish a suspected offender outside the formal legal system. The patient I encountered in the ICU had sustained extensive burns as a result of such punishment. Patients who suffer severe injuries from mob justice face an overall mortality rate over 50%, considerably higher than that seen in other forms of trauma cases (Chalya et al., 2015). This underscores the deep societal distrust in law enforcement and judiciary, often fueled by perceptions of corruption and impunity.

Immersed in the intensity of the ICU, I came to appreciate the value of empathizing rather than simply sympathizing, with the patients' families is crucial for effective care. While sympathy can cloud clinical judgment and decision-making — particularly in sensitive discussions such as signing a do-not-resuscitate (DNR) order or explaining a poor prognosis — I observed this in cases ranging from a patient dying of a pulmonary embolism to a cerebral malaria patient in coma for several days, showing how empathy allows physicians to acknowledge the family's emotions while maintaining clarity, objectivity, and professionalism.

Similarly, during a community medical outreach clinic to underserved populations, I witnessed the importance of strong collaboration with local communities in providing accessible and compassionate care. Yet one patient remains vivid in my memory: a teenage boy who presented with a progressively enlarging, painful lump around his knee. He initially thought the swelling was from a minor injury

sustained while playing soccer, but Dr. Katana, whom I shadowed, had to break the news that it was osteosarcoma. While limb-salvage surgery has become the standard of care worldwide, in much of Africa amputation remains the predominant surgical practice (Olajuba et al., 2025). Watching tears well up in this young boy's eyes as he processed the reality of amputation was heartbreaking. The moment brought to mind my visit to Bombolulu Workshop, where I had learned how cultural stigma around disability can intensify the psychosocial burden. This experience further underscored the importance of cultivating the emotional resilience to remain grounded in empathy.

During my second week rotating in the surgery department, I had the opportunity to learn extensively about medical terminology and surgical procedures. Luckily, this week coincided with a neurosurgery camp, where neurosurgeons from the SAWUBONA Foundation (Germany) visited to perform procedures and follow up on patients from previous years (SAWUBONA, 2021). With less than 1% of the world's neurosurgeons serving the African continent, neurosurgical cases are recognized as an emerging public health concern (Kantawata et al., 2023). I was struck with the reality of how critical it is to exchange knowledge with experienced healthcare providers globally and to build local capacity in order to advance neurosurgical care across Africa.

My week in surgery began in the outpatient clinic, where I engaged directly with patients, observed the practical application of clinical assessments, and listened about their experiences in confronting and managing disease. I observed a patient with cervical myelopathy undergoing reflex testing, where hyperreflexia (an exaggerated knee jerk response) serves as a key clinical sign. In contrast, I was told about the relevance of myelomalacia, an imaging finding on MRI that reflects spinal cord softening due to compression. Importantly, patients may present with cervical myelopathy even without visible myelomalacia on MRI, and conversely, myelomalacia may appear even when clinical signs are subtle or absent. This experience reinforced for me that studying about diseases requires actively capturing the clinical picture and distinguishing signs from imaging findings to fully integrate the pathology of disease.

While shadowing Dr. Degiannis from Germany, I encountered a patient who had undergone resection of pilocytic astrocytoma a year prior and now presented with a new lesion at the original tumour site. The patient remained seizure-free post-surgery, and histological analysis of the lesion again showed no atypia or mitotic activity, consistent with a low-grade pilocytic astrocytoma. This suggested the lesion was most likely residual or recurrent disease, rather than a new glioma. Unlike diffuse low-grade gliomas that can transform aggressively, pilocytic astrocytomas rarely progress to higher grades. Despite this relatively reassuring pathology, I observed the difficult decisions the surgeon had to make. As Dr. Degiannis explained, chemotherapy and radiotherapy are nonexistent in Kenya— a harsh

reality, as they remain financially out of reach for many patients despite the oncology department in CGTRH.

As Dr. Degiannis explained, the outcomes he encounters often fall at two extremes: patients present with conditions too advanced to treat effectively, resulting in a poor prognosis, while others experience remarkable recoveries after surgery. I observed this firsthand alongside him—from elderly patient who underwent lumbar decompression and fusion and later regained the ability to stand independently, to a child with an encephalocele, a congenital neural tube defect, who overcame ataxia and was able to walk with stability. Dr. Degiannis described these moments as joyful and fulfilling, emphasizing that they are the reason he continues his mission of providing care to patients in need, particularly in settings where neurosurgeons are scarce.

In the actual theatre, I had the opportunity to observe craniotomy and tumor resection for various intracranial tumors. One particularly challenging case involved a giant pituitary macroadenoma with suprasellar extension (tumor arising from pituitary cells, growing upward toward the diaphragma sellae and potentially compressing the optic chiasm or third ventricle, Di Ieva et al., 2011). Unlike typical pituitary adenomas, which are removed via a transsphenoidal approach through the nose and sphenoid sinus, this surgery involved a craniotomy and entry into the ventricle for safe aspiration. The tumor was soft and easily aspiratable, consistent with a benign adenoma; however, its superior boundary was unclear. The surgeons encountered a thin layer over the tumor and could not immediately determine whether it was the tumor's pseudocapsule or the diaphragma sellae, the dural layer forming the roof of the sella. Forcibly removing the diaphragma could cause a cerebrospinal fluid (CSF) leak or damage critical structures such as the optic apparatus or hypothalamus. Although intraoperative assessment—including careful visual inspection, tactile evaluation, gentle suction, and observation of CSF pulsations—was used to distinguish capsule from diaphragm, it was unlikely that the entire tumor was resected. This case underscored the critical importance of meticulous surgical technique and real-time intraoperative judgment, while also inspiring me to deepen my understanding of neuroanatomy, as the intricate relationships between the tumor and surrounding structures were challenging yet fascinating to visualize in the theatre.

I cannot conclude my week in surgery without emphasizing the significance of pediatric hydrocephalus. Hydrocephalus is highly prevalent in Kenya, partly due to limited prenatal screening and folic acid supplementation, which increases the risk of neural tube defects. Children often present with complications such as meningitis, and given Kenya's status as a high TB-burden country according to the World Health Organization, infectious diseases must also be considered as contributing factors to hydrocephalus.

To manage these cases, an external ventricular drain (EVD) was placed to temporarily drain cerebrospinal fluid (CSF) to relieve intracranial pressure, and simultaneously obtain CSF for diagnostic infection testing. The procedure involved creating a small burr hole, opening the dura, and advancing a catheter 1–2 cm into the lateral ventricle. CSF collected appears clear if normal or cloudy if infection is present. This step stabilizes the patient before any definitive procedure, such as ventriculoperitoneal (VP) shunt placement. EVD allows CSF sampling for culture or PCR and ensures that no acute infection is present before proceeding with the VP shunt. During the VP shunt procedure, the shunt diverts CSF from the ventricle to the peritoneal cavity, where the peritoneum can safely absorb large volumes of fluid.

One case stood out in particular: isolated dilation of the left temporal horn was observed, requiring two shunts. Hydrocephalus can be classified into two main types: noncommunicating hydrocephalus, caused by obstruction within the ventricular system, and communicating hydrocephalus, resulting from impaired absorption of CSF. The case I observed represented an extreme, localized form of noncommunicating hydrocephalus, in which the affected ventricular compartment becomes sealed off from the rest of the CSF system. Such isolated ventricular dilation is relatively rare and often occurs due to post-infectious scarring or post-hemorrhagic fibrosis.

As my extensive neurosurgery rotation comes to an end, my curiosity about the complexity of neuroanatomy has grown more than ever, along with a recognition of the importance of global collaboration in advancing care.

During the third week, I rotated in internal medicine, having requested the change from pediatrics after meeting Dr. Faruk during a clinical outreach; his passion for teaching and thorough explanations of medical concepts inspired me to learn from him.

In internal medicine, morning rounds are conducted with Dr. Faruk, where a group of interns follows him alongside medical officers presenting their patients. Although crowded rounds are not common in North America, in Kenya, this approach was necessary given the level of medical training, and I appreciated the opportunity to be part of the tense atmosphere, as Dr. Faruk rigorously tested medical officers about their diagnosis, management plan, and broader medical knowledge. His questions span multiple specialties, often emphasizing the pathophysiology of disease and how drugs act to alleviate it. He always reminds us that as doctors we are constantly reading, forgetting, and relearning, and that even brief daily study is essential to keep clinical knowledge alive—a habit I must continue.

Possibly influenced by neurosurgery camp, I will present one in-depth analyzed case seen in internal medicine—the most difficult diagnostic challenges discussed repeatedly by Dr. Faruk this week: a suspected tuberculoma.

The patient was admitted to the ward with neurological manifestations including progressive weakness in the leg, episodes of unconsciousness, recurrent vomiting, and convulsions. MRI of the brain revealed extensive vasogenic cerebral edema, causing obliteration of the ventricular system, and a significant midline shift. This indicated that if untreated, the compression from raised intracranial pressure could progress to brainstem herniation, a potentially fatal complication. The first suspicion was tuberculoma, a granulomatous lesion formed in the CNS resulting from an immune response to *Mycobacterium tuberculosis*. This was based on the presence of two lesions showing characteristic ring-enhancement on MRI and the patient's history of tuberculosis infection.

From this point, I was engaged with the essence of internal medicine, guided by evidence-based evaluation and differential diagnosis, acknowledging the various possible diseases with similar presentations and distinguishing them by their underlying pathology. PCR for TB was inconclusive, and HIV serology was negative, despite HIV being a major risk factor for TB. Additionally, the patient's white blood cell count showed elevated neutrophils and reduced lymphocytes, which is not strongly supportive of tuberculoma. Given the lack of supporting evidence for a tuberculoma, attention was focused on distinguishing the lesion from metastases and primary brain tumors. Metastasis was considered because the patient was elderly, but there was no known history of malignancy. A primary brain tumor, such as glioblastoma, was also considered, but it is unusual to have two separate lesions. Dr. Faruk suggested a brain biopsy to confirm the diagnosis, but this was not recommended due to the high intracranial pressure and the risk of spreading infection if it were an abscess. Later that week, a colonoscopy was performed, revealing something suspicious. But while waiting for confirmation of whether it was a tumor, the patient unfortunately passed away, leaving the underlying cause unknown.

Kenya is undergoing an epidemiological transition, where the longstanding predominance of infectious diseases is now accompanied by a rising tide of non-communicable conditions (Boutayeb et al., 2006). The reality at the bedside is often complex; the patient discussed above had once battled tuberculosis yet continued to carry the silent weight of epilepsy and an untreated malignancy. This double-edged sword cuts deeply—placing families under substantial financial strain, while stretching an already burdened healthcare system, where each additional layer of illness complicates both diagnosis and management.

Non-communicable diseases now account for more than half of all hospital admissions and a significant proportion of inpatient mortality (Boutayeb et al., 2006). In the internal medicine ward, this

reality is reflected in the spectrum of cases frequently encountered, including acute decompensated heart failure, hypertensive emergencies, acute decompensated liver disease, and multiple myeloma. This trend became even more evident during my rotation in the emergency department the final week. While pediatric emergencies were largely dominated by communicable conditions such as pneumonia, sepsis, meningitis, and gastroenteritis with dehydration, I was struck by how often I encountered non-communicable emergencies in adults—far more frequently than trauma-related cases, which I had initially expected to predominate.

For instance, CPR was attempted on a particular patient in the emergency department for over 10 minutes. As the resuscitation continued but no circulation was detected in his foot, I realized that he had passed away. His wife collapsed beside him, overwhelmed with grief. The patient had a long history of uncontrolled hypertension, which over time had damaged his renal vasculature, leading to chronic kidney disease and eventually end-stage renal disease. He required hemodialysis, yet financial constraints prevented him from attending the hospital for regular treatment. Severe electrolyte disturbances, including hyperkalemia and metabolic acidosis, likely triggered arrhythmias that progressed from ventricular tachycardia to fibrillation, prompting the resuscitation efforts. This case highlighted for me the critical issues of limited health literacy regarding non-communicable diseases, poor medication compliance, and the financial barriers that prevent patients from accessing essential therapies and follow-up care.

Last but not least, seeing an unconscious patient brought into emergency following a suicidal attempt with paracetamol poisoning highlighted that mental disorder cannot be ignored. The opportunity to be involved in mental health education for secondary school students reinforced the importance of educating others to improve community health literacy. It also showed me the value of providing support, sharing my perspective, and being someone who listens—qualities I intend to emphasize as I take on greater leadership roles in my community.

Experiencing the impact of international healthcare collaboration in Kenya was truly inspiring. From the neurosurgery camp organized by the Sawobona Foundation in Germany to the establishment of the medical ICU at Coast General Teaching and Referral Hospital through the support of JICA, I witnessed the dedication and expertise that transcends borders. Every time I introduced myself, doctors noticed my Japanese background and eagerly shared their experiences, expressing appreciation for the doctors who came from Japan to work with them during the challenging COVID-19 period. This made me proud of my background, and inspired me to one day serve underserved communities in a similar way—collaborating with communities with cultural sensitivity, sharing expertise that is valued and empowering to them, and contributing to the lasting development of local healthcare systems.

Beyond inspiring my future ambitions, my time in Kenya profoundly reshaped my perspective as a person. One of the most powerful lessons I gained was a deeper recognition of gratitude. Immersed in a setting where resources were scarce yet generosity flowed freely gave me perspective on the privileges I often take for granted. Whether it was patients sharing their stories or students in Kenya welcoming me with openness, I was struck by the compassion and kindness that thrived despite hardship. Their resilience redefined what I believe to be most essential in life: meaningful human connections, the bonds of community, the ability to appreciate what we already have.

Reflecting on these experiences, I recognize how deeply they connect to the curiosity about medicine and the personal health challenges that first shaped my journey. Just as navigating my own illnesses ignited a desire to understand disease and provide meaningful care, my time in Kenya deepened my appreciation for the power of empathy, the significance of cultural insight, and the responsibility of serving others with humility. These lessons have fortified my resolve to pursue medicine not merely as a profession, but as a lifelong commitment to addressing healthcare disparities, supporting communities, and continually learning from diverse perspectives and experiences.

I am deeply grateful to the friends and colleagues I met from around the world through this program, as well as the doctors, medical officers, nurses at Coast General Teaching and Referral Hospitals, and program mentors who taught me and offered new perspectives. The medical knowledge I gained, along with the opportunity to immerse myself in healthcare in Kenya, is an experience I will carry with me throughout my continued studies in medicine.

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