

Uganda Report

September – October 2025

A Trip Report, Journal, & Guide for Future Volunteers

By Paul Nguyen

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Kabale, Uganda



Kabale, Uganda



Headshots of the Direct Student class

CONGRATULATIONS



KABSOM Anesthesiology Class of 2027

Summary

From September 20 to October 19, 2025, I traveled to Kabale, Uganda to serve as a volunteer anesthesia educator at Kabale School of Medicine (KABSOM). Over four weeks, I taught three cohorts: a junior Bachelor of Anesthesia degree class (~25 students), a junior Diploma class (~5 students), and a senior Diploma class (~3 students). I observed and assisted in clinical care across the maternity and medicine wards, ICU, and operating rooms. Working closely with Sister Benny, an experienced clinical officer, I helped students develop skills in airway management and spinal anesthesia while emphasizing safe vitals monitoring. I am currently collaborating with KABSOM students to develop a Book of Standard Dilutions, a practical, locally adapted reference that will support their clinical preparation long after volunteers have returned home.

To better understand my students' goals, I held one-on-one meetings with nearly all of them, noting where they were from, why they chose anesthesia, what challenges they anticipated, and what they hoped to gain from the course. These conversations helped me identify students who needed extra support, for whom I arranged office hours, as well as emerging leaders who could teach their peers (one ultimately delivered the lecture on Pain Management). Through these meetings, I developed a personal relationship with many of the students. Throughout the month, we shared meals. They coordinated a surprise goodbye party with all my students from the different classes and staff from the hospital. We played board games and went dancing in town, and I still play chess with one of the students online. As a portrait photographer, I gifted headshots for each student to use for their future professional profiles as well as a class photo. When one of my students passed away after I left Uganda, several students reached out to me to chat, and we spoke on WhatsApp to debrief. What we built in that month motivates me still.

Dr. Henry Bukwirwa was one of the most welcoming and generous people I met on this trip. He introduced us to hospital leadership, coordinated our clinical access, and invited us on a multi-day road trip to visit healthcare facilities across the country. In addition to Kabale Hospital, we visited Kisiizi Falls Hospital, Bwindi Community Hospital, and Kebisoni Health Services. Isaac and Angella, the student leaders for the direct and diploma classes respectively, were indispensable guides from day one, and Isaac joined us on our visit to these hospitals. I also overlapped with two attending physicians from the United States whose company made the experience even richer. Together, we explored the region, reviewed difficult cases, and brainstormed ways to strengthen the program.

Outside the hospital, we visited Lake Bunyonyi, tracked silverback gorillas in Bwindi Impenetrable Forest, spent time with the Batwa community, and celebrated the end of our studies together. It was one of the most meaningful experiences of my career, and I hope to return.

Photos from the last day of class



Board games at The Gathering Place



Cake and gifts with Dr. Henry and Sister Benny, and student leaders



End of course photo with class leadership

Key Points for Future Volunteers

Arrival

I flew from San Francisco to Kigali, Rwanda, then crossed the border by road into Uganda. My first night in Kigali was at Heaven Hotel — a lovely spot with complimentary breakfast and a free 20-minute massage. Transport from the airport can be arranged through the hotel.

HVO connected me with Mr. Milton, who drove me from Heaven in Rwanda directly to Jophan Hostel in Uganda. He is warm, knowledgeable, and stopped at scenic overlooks along the route. His wife runs a shop in Kabale that sells excellent mixed nuts and seeds. Bring a large bottle of water and hearty snacks for the road and your first night in Kabale, as options may be limited upon arrival. Bring a few hundred USD in cash to exchange at the border, which Mr. Milton facilitated.

The border crossing requires a Yellow Fever vaccination card. Get one before you leave—it is a requirement, even though it is not always strictly checked.



Crossing the border from Rwanda to Uganda

First Day Orientation

Make sure you are formally introduced to hospital leadership on your first day. Ask Dr. Henry or one of the student leaders to arrange this and accompany you. The hospital and medical school are walkable from Jophan, but having a student with you on day one makes everything

easier. They can help you buy a SIM card, find shoes for the OR, and navigate the town. After that first day, I felt comfortable moving around independently.

Everyone in Uganda communicates via WhatsApp. Download it and make sure you are added to the relevant group chats as soon as possible. Connect with the class leaders early to arrange the location and time of your first lecture.

Day-to-Day Living

Jophan Hostel is where most volunteers stay. Peace and Benson run it and can arrange home-cooked meals and laundry for a modest fee. They accommodate dietary restrictions, including dairy-free and vegetarian. Coordinate meal times at least a day in advance. Once you pay, they handle the shopping, cooking, and cleaning. They also boil water the night before and leave it in a large thermos for tea or coffee the next morning. They typically do not cook on weekends unless you request it in advance.

Your room has a covered outdoor patio, a private bathroom, and feels safe. Keep the doors locked when you leave. Get home before dark: the metal gate to Jophan locks around 6:30–7pm, and you will need to knock loudly for the security guard. I used the regular tap water to brush my teeth without issue, though I was advised to use boiled water just in case.



View from my patio at Jophan



My room at Jophan



Bathroom at Jophan



The entrance gate



Walking home in the dark from White Horse Inn (not recommended)

Food

White Horse Inn is a reliable option. The chicken fajitas are good, the coffee and tea are excellent, and the Wi-Fi is free. It also has a downstairs bar where football is always on—a good place to work or decompress after a long day. Many international visitors and workers pass through, making it a good place to meet people.

My favorite spot in Kabale was The Gathering Place. It has live music (some medical students perform!), board games, and an outdoor patio overlooking the street below. Bea's Restaurant does solid pizzas and Indian food; Dr. Henry considers it his favorite and tends to take volunteers there for a goodbye dinner. Numba Café & Boutique is a beautiful, calm space for fresh juices, smoothies, and quiet work.

I normally ate at Jophan with Benson and Peace because it was convenient, but eating out in town was always a treat.



Food at White Horse Inn



Home-cooked by Benson and Peace



Dr. Anil + his wife Patricia's goodbye dinner at Bea's Restaurant with Dr. Henry and Isaac



Numba Café (upstairs)

Transportation

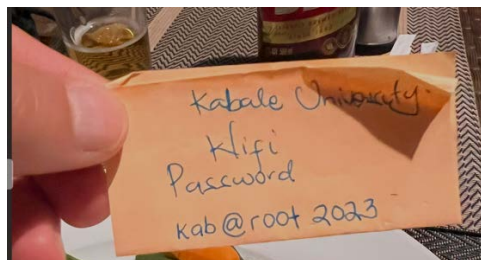
Bodabodas aka the motorcycle taxis, are how you get everywhere. They are fast, affordable, and once you get used to them, so much fun. Wave them down or simply stand still and they will find you. Always wear the helmet. Hold onto the back rail, not the driver's waist (I learned this the embarrassing way). Negotiate the fare before you get on: a fair in-town rate is around 2,000–3,000 Ugandan shillings. Drivers will sometimes quote higher fares to newcomers. Bring small bills because they don't always have change.

Money

Multiple ATMs and foreign exchange offices like the Forex Bureau are available in Kabale town. They all have armed guards, which may look alarming but is entirely routine. I always felt safe handling money there. The exchange rate changes daily, and you will get a less favorable exchange if your bills have any physical damage.

Internet

Jophan has its own wifi. The hospital and medical school do not have wifi, but you can connect via ethernet cable if needed. I bought a local SIM card for the month, which gave me reliable mobile data and made communication much easier.



Teaching: Students, Spaces, Schedule

My greatest challenge in teaching here is the wide range of educational backgrounds and clinical experience among the students. The direct Bachelor's students ranged from those straight out of high school to working nurses and pharmacists — but all will graduate with a Bachelor's in Anesthesia (~25 students). I found their level roughly comparable to a third-year U.S. medical student entering an anesthesia clerkship. They are eager, curious, and motivated to learn. There is another Direct Bachelor's class a year ahead of my class, but a different HVO volunteer taught them. That class operated more like early CA-1 residents and helped instruct the younger students in the operating room.

My Diploma class was smaller (~3-6 students) and exclusively experienced clinicians — prior nurses, clinical officers, and others with hands-on backgrounds. However, their actual level varied considerably, which required more tailored teaching and was more difficult to conduct. Because they were still working, attendance was also inconsistent, and I often had to repeat lectures. I resolved this by having students who had attended the previous class, teach the newcomers. This reinforced their own learning while enabling peer-to-peer instruction.

I taught daily, with lectures running two hours each—sometimes totaling four to six hours per day. I used PowerPoint projected onto a blank wall or through an HDMI cable connected to a large TV screen. There is no fixed lecture schedule—you set it with the students. My typical weekday looked like this:

- 8:00–11:30 AM: Operating room, ward rounding, or lecture if OR cancelled
- 11:30 AM–1:30 PM: Break and prep time (working on lectures)
- 2:00–4:00 PM: Direct class lecture
- 4:00–6:00 PM: Diploma lecture
- 6:00–7:00pm: Dinner/ Office Hours

I held office hours during dinner and on weekends.

A few things to know: Sister Benny expects the Direct students to pre-op the next day's patients in the afternoon, so aim to release them by 4–5 PM. Other physicians may schedule lectures that conflict with yours, sometimes with very little notice, and those lectures are occasionally cancelled at the last minute. If that happens, make sure students contact you immediately so you can fill the time.

Securing a teaching space is a daily task: rooms are first-come-first-served, and PhD, nursing, and internal medicine students all compete for the same spaces. The options are the large classroom or backyard at Jophan, or one of the classrooms at the hospital and medical school.



Classroom at Jophan



Classroom at Jophan



Classroom at KABSOM Medical School



*OR cancelled due to autoclave malfunction —
lecture moved to the PACU*



Final exam day at Jophan



Portico at Jophan



Backyard at Jophan

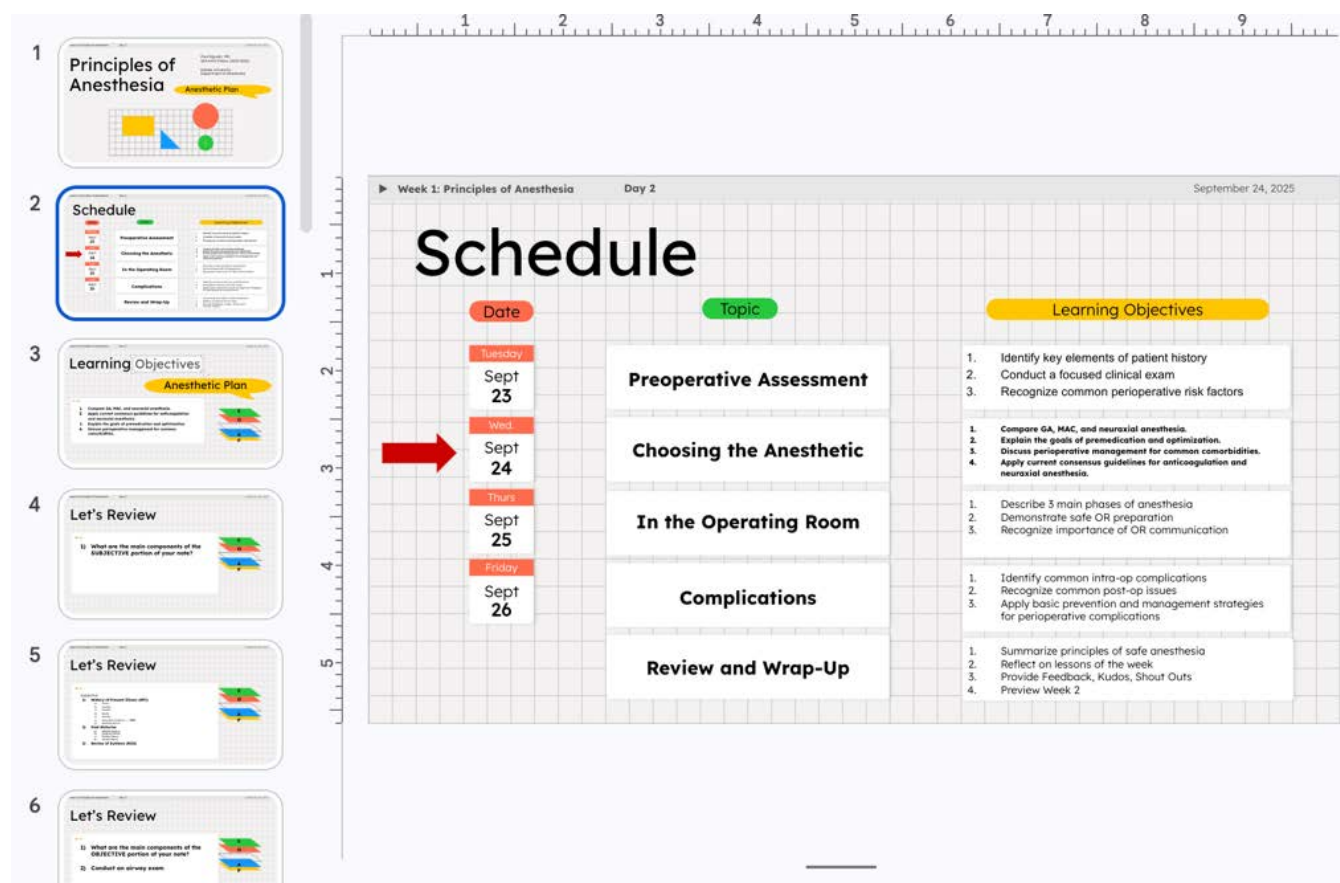


Courtyard at Jophan

Course Outline + Lecture Materials

I signed up to teach three courses: Principles of Anesthesia, Pain Management, and Pediatric Anesthesia. Prior to arrival, I asked for the syllabus for each course, which helped me prepare my lectures. However, the date you arrive may not align with when they need a particular lecture (for example, if you arrive at the end of their academic calendar, they may have already covered Principles of Anesthesia), so be flexible. I also taught respiratory physiology and intraoperative emergencies which I didn't sign up for, but they needed those lectures.

I found it helpful to make a weekly schedule and present it to the class. The students inform me of special days, such as World Anesthesia Day, Regional Anesthesia Day, political elections day, national holidays, etc..., which change when I gave lectures. All my lectures are uploaded to the HVO website for future volunteers to access, and I shared them with students immediately after each class. (See Document #1)



My Week 1 Schedule

Note about students' resources: students did not have laptops and studied from their phones. They downloaded lecture PDFs on WhatsApp and followed along. Test your lectures on your own phone to check legibility and font size. Some students did not have phones, so I occasionally let them use mine. Limit unnecessary images and animations, as downloading large files can take a very long time.

Many students did not bring writing utensils or paper. Consider purchasing a stack of blank paper and pens in town. Additionally, many students go straight from the OR to your lecture without eating lunch. I found that morale and engagement greatly improved when I brought snacks.

I began each class with practice questions and a review of the previous day. I wrote both the midterm exam (which I administered and graded at the end of my month) and the final exam which I gave to Drs. Henry and Isabella to administer after I left (*See Document #2*). Both included a grading rubric and answer key. I recommend multiple-choice questions to simplify grading. Be prepared to send grades to Dr. Henry and Isabella.

Operating Room

When I arrived in September, none of my direct students had intubated a patient, though nearly all had attempted spinal anesthesia. A few things to know about the OR environment: students are not always supervised; EKG stickers and monitors are in short supply; and the rooms sometimes share a single suction device moved between cases. There are three operating rooms with one dedicated to obstetrics, another to ortho and/or general cases.

Cases are frequently cancelled. Be prepared to pivot. Some of my best teaching sessions happened in the PACU or outside on a porch when the OR went quiet. Keep your lecture slides handy and be ready to teach anywhere.

The OR also gets crowded, sometimes 20 to 30 people, because surgical students attend alongside your anesthesia students. Be deliberate about carving out space for your students to learn.

What to bring for the OR:

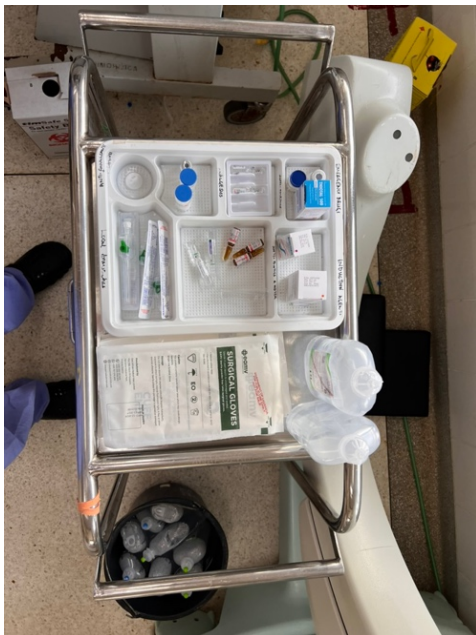
- Multiple sets of scrubs (change in the locker room)
- Scrub cap
- Your own reusable mask
- Multiple boxes of gloves in varied sizes to leave there
- OR shoes or crocs (available cheaply in town)
- Stethoscope



Operating Room #1



Halothane ventilator



Anesthesia tray



Fluid warmer

MINISTRY OF HEALTH ANAESTHETIC REPORT

Date: _____ Name: _____ Age: _____ Sex: _____

Operational: _____

Preoperative Assessment: B.P. _____ P. _____ TO _____ IB _____ Urine _____

History: _____

CVS: _____

R.S. _____

General: _____

Drugs: Steroids Neo/Streptomycin Hypotensive M.A.O. Inhibitors Phenytoinazins

Other therapy: _____

ANAESTHETIC

Duration	Anaesthetist	Results
Premedication	Time	
GENERAL	IV/ Open Mask EMO Boyle Semi-open/CO ₂ absorption T. piece	
Endotracheal Tube Size	Oral Nasal Amnosed Cuff. Pack Difficulty NO. TUBE	

Total Drugs

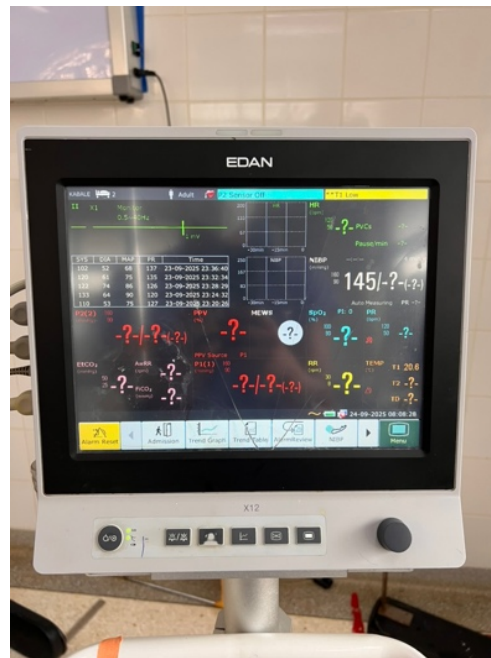
Time	Total Drugs
Pulse	
B.P.	
Drugs	
Remarks	

Total I.V. Fluids at Open. Blood. Plasma Subs. Other

Final Condition of Pt.

Remarks

INSTRUCTIONS TO WARD



Extracurricular Activities

Life outside the hospital is important (see Food section above for restaurant recommendations). We were fortunate that Dr. Henry drove us in his personal vehicle to several of these locations. You can also arrange your own transportation through Mr. Milton.

Lake Bunyonyi

Lake Bunyonyi is about 30 minutes from Kabale and well worth a half-day visit. You can also stay there in a cottage for a few days. It is one of the deepest lakes in Africa, dotted with small islands, and strikingly beautiful. Dr. Henry organized a visit early in our trip. Boat rides between the islands can be arranged on the water, though we elected to stay on the pier. We always covered his fuel costs since he drove us in his personal car.



*Cottages at Bunyonyi.
Some looked like resort-
type accommodation for
tourists*



Lake Bunyonyi

Kisiizi Falls + Kisiizi Hospital

Kisiizi Falls was our first stop on the way to Bwindi. It has a dark history: according to local tradition, unmarried pregnant women were brought to the top of the cliff and pushed to their deaths by their fathers and brothers. The practice reportedly ended when a girl who was pushed over the edge grabbed hold of her father and brother, dragging all three to their deaths.

The same waterfall now generates electricity for Kisiizi Hospital, which has its own maternity ward and serves everyone in the community. Kisiizi Hospital is a nonprofit run by the Church of Uganda that provides higher-level medical services.



A memorial statue at Kisiizi Falls depicting the death of unmarried pregnant women.



Kisiizi Falls, which now powers the generator for the nearby hospital and maternity ward



Hallway connecting two operating rooms. Blue scrubs are provided.



OR set up. Ventilator, tank, suction, table, monitors, IV pole, medication storage.



Portable ventilator using isoflurane.



(Left) Medication cabinet with labels.

(Below) Hallway outside the operating rooms. This also sometimes serves as the PACU.



Suba Motel in Kihiihi + Kigezi Game Drive

After leaving Kisiizi, it was dark, so we spent the night at Suba Motel in Kihiihi. Dr. Henry's friend Barnabas, who belongs to the same Rotary Club, helped arrange a private game drive the following morning in the nearby Kigezi Game Reserve, which lies along the border of the Democratic Republic of the Congo. After breakfast (which was included), we set out at 6am to reach the reserve before it became too hot. Of the Big Five safari animals, four can be found naturally in Kigezi. Our driver was very experienced and helped us identify animals in hiding. We saw two of the big five, including buffalo and a newborn elephant, as well as other animals like hippos, baboons, and various birds and antelopes.

Payment for the hotel was available by credit card, but payment for the game drive was cash only.

A summary of expenses in USD are below:

- Park entrance for foreigners - \$40
- Car entrance - \$10
- Hired driver and fuel - \$130 (split three ways in our group)
- Accommodation at Suba single room - \$40



Breakfast table at Suba



Roof opens during the drive while keeping the shade. Water bottles included.



Car seats at least 7-8 people, but there were only three of us on the drive.



*Two male impalas
sparring.*



*A herd of wild buffalo,
a flock of birds above*



*A mother baboon carrying
her infant on her back.*



Two hippos in the river by our bathroom stop



*Vervet monkey peering at us
as we leave the game reserve*



*A mother elephant standing
protectively over her calf, which
is maybe a few weeks old*

Gorilla Trekking — Bwindi Impenetrable Forest + Bwindi Hospital

After leaving the game drive, we drove to Bwindi Impenetrable Forest for silverback gorilla trekking. This was one of the most extraordinary experiences of my life, and I highly recommend if you have the opportunity. It was arranged through Barnabas, Dr. Henry's friend from the Rotary Club. We wired \$850 USD directly to him, which was somewhat complicated only due to the currency exchange and daily limitations of Stanbic Bank. Once this was done, however, Barnabas took care of everything, including reserving official trekking permits, accommodation, and transportation from the Bwindi Hospital Guest House directly to the trekking point. It was worth it.

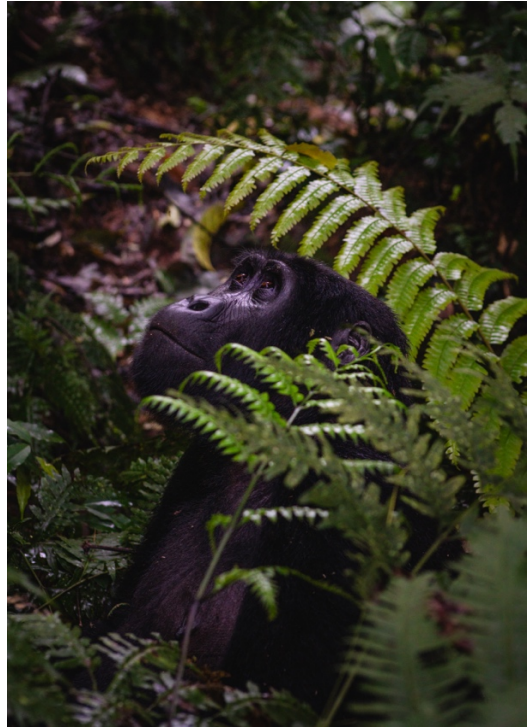
The Bwindi Hospital Guest House is run by a family originally from the USA (I think?), who frequently host medical staff visiting the attached hospital. It is where Dr. Scott and Carol Kellermann, who founded the hospital, used to stay, and is the same hospital where Dr. Henry and his Rotary Club provided administrative and clinical support. Breakfast and dinner were included in our reservation (I forget the cost, but it was reasonable). We each had our own large rooms with a private bathroom.

Barnabas recommended that we each hire a porter, who not only carries your backpack, but physically assists you along the difficult terrain. Even if you can hike well, hiring a porter is a good way to support the local business and only costs around \$20-30 USD + tip. Our trekking group included about 8 other tourists and a research group/ guide. We arrived by 7am to watch the Batwa performance and orientation, left for the hike by 8am, and returned by 3pm. Our hike was difficult, about 2,000m of steep, slippery elevation, but we were told there are other easier hikes depending on the demographic of your trekking group.

I would bring:

- Multiple pairs of long socks
- Hiking pants – there are thorns in the thick brush
- Bug spray
- Water bottle
- Face mask (required when near gorillas due to risk of respiratory illness. Barnabas provided us some)
- Backpack to carry lunch

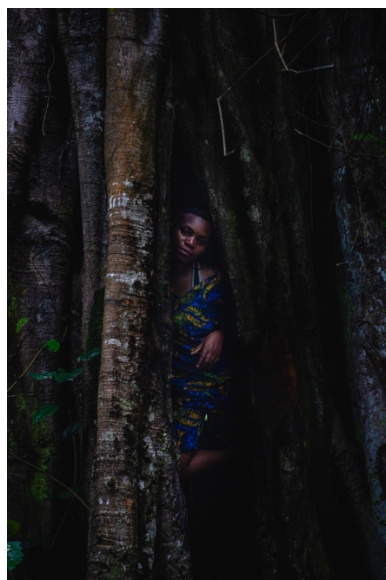
We were too tired to tour the hospital that afternoon and spent the night because it began to rain. Our car had gotten stuck in the mud.



The Batwa Community – “The Keepers of the Forest” + Bwindi Community Hospital

In Bwindi, we spent time with members of the Batwa tribe—one of the oldest hunter-gatherer communities still in existence and the original inhabitants of the Bwindi Impenetrable Forest. When the national park was established in the late 20th century, the Batwa were displaced from their home which they’ve had for thousands of years. The loss of land meant the loss of livelihood, identity, and in many cases, life itself. It’s a cost that sits uncomfortably alongside the gorilla tourism that draws visitors like us to the forest. Drs Scott and Carol Kellermann, American medical missionaries, founded the Bwindi Community Hospital to support the Batwa people. This also is the hospital that Dr. Henry and the Rotary club supported by obtaining anesthesia machines and ICU equipment.

It cost \$30 USD to go on the walking, interactive tour and took about 1 hour. It is a 10 minute walk from Bwindi Community Hospital.





Kebisoni Health Services in Rukungiri

Kebisoni Health Service was the last stop on our road trip before returning to Kabale. This health center was the smallest of the medical centers we visited, and it serves a small district in Rukungiri. They can perform C sections but have otherwise limited specialist care. They stabilize patients before referring them to larger district or mission hospitals like in Kabale or Kisiizi. Like many health centers, the Kebisoni Health Service faces significant understaffing. One or two anesthesia graduates are sometimes the only anesthesia providers for the entire hospital.



Isaac, Dr. Henry, and a nurse reviewing the maternity log book



A Note of Thanks

Dr. Zutz and family, a sincere thank you. None of this would have been possible without your support, and I want you to know that you made it made possible. Because of your generosity, we were able to spend time working with students who were just beginning their journeys in anesthesia. I had the privilege of supporting trainees as they intubated for the first time and watching their confidence grow as they safely placed spinals for C-sections.

Beyond the technical skills, what stood out the most was their enthusiasm and sense of responsibility to their patients and communities. Many spoke about their hopes to return to their hometowns to work as an anesthesia provider. Sharing in those moments of learning and reflection was incredibly rewarding.

I went to teach and ended up learning as much as I gave, and I am already thinking about how to go back. Thank you again for making this possible!

With gratitude,

Paul Nguyen

Documents

#1: Learning Objectives + Month Schedule

Principles of Anesthesia

Morning OR focus: Pre-op evaluation, induction, maintenance, recovery.

Day 1 – Preoperative Assessment, NPO Guidelines (Sept 23 Direct, Sept 29 Diploma)

- **Objectives:**
 1. Identify key elements of patient history and focused physical exam.
 2. Conduct a focused physical exam and apply ASA and Mallampati classifications
 3. Recognize common perioperative risk factors

Day 2 – Choosing the Anesthetic – Neuraxial (Sept 24 Direct, Sept 29 Diploma)

- **Objectives:**
 1. Introduce 3 methods of anesthesia: GA, MAC, neuraxial
 2. Explain the goals of premedication and optimization
 3. Demonstrate proper positioning for neuraxial procedures
 4. Describe risks and monitoring of neuraxial procedures
 5. Apply current consensus guidelines for anticoagulation in the setting of neuraxial

Day 3 – In the Operating Room: Preinduction and Induction (Sept 25 Direct, Sept 30 Diploma)

- **Objectives:**
 1. Describe phases of anesthesia (preinduction, induction, maintenance, emergence, recovery).
 2. Conduct a thorough airway exam
 3. Demonstrate safe OR preparation (MS MAID)
 4. Describe technique of adequate mask ventilation and positioning
 5. Categorize intubation views using Cormack-Lehane classification system

Day 4 – In the Operating Room: Induction (Sept 26 Direct, Oct 1 Diploma)

- **Objectives:**
 1. Demonstrate proper intubation technique
 2. Confirm ETT placement
 3. Compare and contrast standard vs RSI induction

Day 5 – In the Operating Room: Maintenance (Sept 29 Direct, Oct 2 & 3 Diploma)

- **Objectives:**
 1. Compare different methods of maintaining anesthesia
 2. Apply 4-2-1 rule to determine fluid administration intraoperatively
 3. Explain the multiple methods of fluid loss during surgery
 4. Introduce concept of maximum allowable blood loss and estimated blood volume
 5. Discuss pharmacology of common vasopressors

Day 6 – In the Operating Room: Maintenance, Emergence, Recovery (Oct 1 Direct, Oct 7 & 8 Diploma)

- **Objectives:**
 1. Apply cerebral autoregulation curve to intraoperative management of blood pressure
 2. Describe safe extubation criteria
 3. Clinically assess the different stages of Anesthesia and the unique risks in Stage II
 4. List common complications in the postoperative period
 5. Describe different levels of Monitored Anesthesia Care
 6. Make a comprehensive anesthetic plan utilizing all phases of anesthesia

Day 7 – Review + Introduction to Intraoperative Emergencies (Oct 2 Direct, Review session Oct 10 Diploma)

- **Objectives:**
 1. Make a comprehensive anesthetic plan utilizing all phases of anesthesia
 2. Discuss exam content
 3. Introduce algorithm for “Can’t Intubate, Can’t Ventilate”

Pain, Respiratory Crises & Asystole/PEA Management

Day 1 – Pain Management (Oct 7)

- **Objectives:**
 1. Differentiate nociceptive vs neuropathic pain
 2. Describe the pathophysiology of pain
 3. Evaluate different methods of pain assessment in a clinical setting
 4. Apply WHO pain ladder with available drugs.
 5. Create a multimodal pain management plan

Day 2 –Respiratory Emergencies (Oct 8)

- **Objectives:**
 1. Recognize perioperative respiratory emergencies

2. Demonstrate crisis management steps for hypoxia, anaphylaxis, bronchospasm/laryngospasm
3. Apply the Stanford Emergency Manual algorithm

NO CLASS ON OCT 9 (HOLIDAY)

Day 3 – Respiratory Emergencies (continued) & Crisis Management of Asystole/ PEA

(Oct 10)

- **Objectives:**
 1. Recognize perioperative respiratory emergencies
 2. Demonstrate crisis management steps for Oxygen Failure, Power Failure, High Airway Pressure
 3. Demonstrate crisis management steps for asystole/ PEA

Respiratory Physiology

Day 1 - Monday - Oct 13 – Progressive Exam on Principles of Anesthesia (1 hour)

Grade and Review Exam on same day

Day 2 – Respiratory Physiology (Oct 14 Direct)

- **Objectives:**
 1. Describe physiological anatomy of respiratory system and explain how structural features support gas exchange
 2. Understand mechanics of respiration and interpret key pulmonary function tests
 3. Define and interpret lung volumes and capacities, relating changes to age, posture, and intraoperative changes

Day 3 – Respiratory Physiology (continued) (Oct 15 Direct)

- **Objectives:**
 1. Interpret clinical significance of oxygen-Hg dissociation curve
 2. Understand the neural and chemical control of respiration and how it is influenced by anesthesia
 3. Explain how ventilation-perfusion relationships affect oxygenation

Day 4 - Thursday, Oct 16 World Anesthesia Day (No Class)

Day 5 – Wrap-up, Feedback, Review (Oct 17) → Last day of class

Pediatric Anesthesia

Day 1 – Pediatric Airway & Drug Dosing (Oct 9 Diploma adv)

- **Objectives:**

1. Recognize anatomic and physiologic differences in the pediatric airway.
2. Safely perform bag-mask ventilation and intubation with limited equipment.
3. Calculate weight-based drug doses for common pediatric agents.

Day 2 – Pediatric Procedures & Complications (Oct 11 Diploma adv)

- **Objectives:**

1. Formulate anesthetic plans for common pediatric procedures (hernia repair, tonsillectomy, emergencies).
2. Identify intraoperative complications (bradycardia, hypoxia, hypoglycemia).
3. Apply postoperative pain and airway management strategies in children.

Key Dates

Exams

Principles of Anesthesia & Pain Management – Direct. Monday, Oct 13

Principles of Anesthesia – Diploma, (practical portion), Monday, Oct 13

Principles of Anesthesia – Diploma, (written portion), Wednesday, Oct 15

Introduction to Pediatric Anesthesia – Diploma, Tuesday, Oct 14

World Anesthesia Day – Oct 16, presentation of “Recipe Book of Common Dilutions and Medications”

Oct 17 – Wrap up, Feedback, Reflections.

#2: Principles of Anesthesia Final Exam + Key

Principles of Anesthesia + Pain Management – **Final Exam Key and Grading Criteria**

Written by Paul Nguyen, MD, MEd

November 19, 2025

Instructions

Diploma Students (Angella's class) may take only the Principles of Anesthesia portion because we did not have a pain management lecture.

Direct Students (Isaac's class) may take the full Principles of Anesthesia + Pain Management exam.

Format

5 short answer (*17.5 points total + 1 bonus point*)

40 multiple choice

30 Principles of Anesthesia (*each question worth 2 points, 60 points total*)

10 Pain Management (*each question worth 2 points, 20 points total*)

Grading Instructions

Diploma: Principles of Anesthesia Exam: 77.5 points total

Direct: Principles of Anesthesia Exam + Pain Management exam: 97.5 points total

To grade the diploma students: Principles of Anesthesia exam, add the total # of points earned by the student and divide by 77.5.

To grade the direct students: Principles of Anesthesia + Pain Management, add the total # of points earned by the student and divide by 97.5

Duration: 1 hour +/- 10 min

Principles of Anesthesia Final Exam

ID #: _____

Short Answer (5 questions)

1. Name at least 4 methods to quickly confirm ETT placement after intubation in the operating theatre.

Correct Answers: fogging/ misting in the ETT (1pt), bilateral chest rise (1pt), auscultation of bilateral lungs (best performed in the axillae) (1pt), capnography or presence of end tidal CO₂ (1pt), ballottement of ETT (feeling ETT cuff in the suprasternal notch after inflating the cuff) (1pt).

Note: While imaging such as a chest x-ray does confirm ETT placement, it is not routinely used in the operating room to assess proper positioning and therefore is an incorrect answer.

Grading criteria (1 point for each correct answer), 4 points total. Consider +1 bonus point for listing 5 correct answers.

2. The airway exam discussed in class is listed here:

1. **Open mouth**
 - a. Mallampati
 - b. Teeth (damaged, loose, missing?)
 - c. Mouth opening
2. **Look up towards the ceiling**
 - a. Thyromental distance
 - b. Neck extension
3. **Bite upper lip**

Using the airway exam above, describe in detail 5 exam findings that would **indicate a difficult airway**.

Correct Answers:

- 1a. Mallampati III-IV (1pt)
- 1b. doesn't contribute to a difficult airway. The absence of teeth may actually improve direct laryngoscopy (*deduct 1 point if answer includes teeth as a contributing factor to a difficult airway*)
- 1c. small mouth opening, short inter-incisor distance (1pt)
- 2a. short thyromental distance, i.e. less than 6cm or roughly 3 finger widths (1pt)
- 2b. neck immobility, decreased range of motion of the neck (1pt)

3. inability to protrude lower jaw out or bite upper lip (1pt)

Grading Criteria. 1 point for each correct answer. 5 points total. Deduct 1 point if answer incorrectly includes teeth as a contributing factor to difficult airway.

3. The MS MAIDS acronym is our safety checklist as we prepare our operating room. What does MS MAIDS stand for?

Correct Answers

(0.5pts) Machine → is your ventilator turned on and working?

(0.5pts) Suction → suction is working and within reach

(0.5pts) Monitors → at minimum, have the pulse oximetry and blood pressure

Ideally, would also have EKGs

(0.5pts) Airway → Are you using an ETT or LMA?

(0.5pts) IV → does the patient have an IV bag of fluids?

(0.5pts) Drugs → what medications will you need for induction?

(0.5pts) Special Equipment → e.g. a ramp if the patient is obese

Grading Criteria. 0.5 points for each correct answer. 3.5 points total. The order does not matter as long as all components are listed.

The next two questions use the same clinical scenario.

4. A 6-year-old child weighs **15 kg** and is scheduled for an appendectomy. Using the **4–2–1 rule**, what is the correct hourly maintenance fluid rate? Show all work for full credit.

Correct Answer:

First 10 kg → $10 \times 4 = 40$ mL/hr (1pt)

Next 5 kg → $5 \times 2 = 10$ mL/hr (1pt)

Total = 40 + 10 = 50 mL/hr (1pt)

Grading Criteria. 1 point for each step. 3 points total

5. A 6-year-old child weighs **15 kg** and is scheduled for an appendectomy. If the patient has been NPO for 3 hours, how much fluid should you give to account for 4 hours of NPO time? Show all work for full credit.

Correct Answer:

[hourly maintenance fluid rate x hours NPO] = total volume of fluid given to account for NPO time

50mL/hr x 4 hrs= 200mL

Grading Criteria. 1 point for showing work. 1 point for correct answer. 2 points total

Multiple Choice Section (40 questions)

6. A **58-year-old** man with the following findings presents for an elective laparoscopic cholecystectomy.
- Type 2 diabetes mellitus, poorly controlled
 - Hypertension, well controlled on two medications
 - BMI 39
 - No end-organ complications
 - Able to climb one flight of stairs slowly due to fatigue

What is the MOST appropriate ASA classification?

- A. **ASA II**
- B. **ASA III**
- C. ASA III-E
- D. **ASA IV**
- E. ASA V
- F. ASA VI

Correct Answer: B— Poorly controlled diabetes, obesity, and reduced functional capacity place him in ASA III without meeting life-threatening criteria (so not ASA IV). Recall that **ASA II** – Mild systemic disease, **ASA III** – Severe systemic disease with functional limitation, **ASA III–E** – Severe disease requiring emergency surgery, **ASA IV** – Severe disease that is a constant threat to life. **ASA V**- moribund patient who is not expected to survive without the surgery. **ASA VI** – brain-dead patient whose organs are being removed for donation purposes

7. A 35yo female presents for an elective C-section. She reports:
- 1 miscarriage at 12 weeks
 - 1 stillbirth at 38 weeks
 - 1 term live birth

She is now pregnant again at 39 weeks. What is her GPA?

- A. G4 P2 A1
- B. G4 P3 A0
- C. G3 P2 A1
- D. G4 P1 A2

Correct Answer: A

- G4: currently pregnant + 3 previous
- P2: two deliveries ≥ 20 weeks (stillbirth + term)
- A1: one miscarriage

8. A 3-year-old child is scheduled for an elective inguinal hernia repair. During preoperative questioning, the mother reports the child drank a cup of water and ate a **banana**. According to standard fasting guidelines, what is the MOST appropriate decision?
- A. Proceed with surgery as scheduled
 - B. Delay surgery for at least 2 hours
 - C. Delay surgery for at least 4 hours
 - D. Delay surgery for at least 6 hours

Correct Answer: D — light meals (banana) require a minimum 6-hour fasting period. Clear liquids (water, tea, coffee w/o milk) require a minimum of a 2-hour fasting period.

9. During direct laryngoscopy, you can see the **posterior portion of the glottic opening**, including the arytenoids and part of the vocal cords, but the **anterior commissure is not visible**. According to the Cormack–Lehane classification, what grade view is this?



- A. Grade I
- B. Grade IIa
- C. Grade IIb
- D. Grade III

Correct Answer: B — Grade IIa (partial view of the vocal cords and posterior glottis).

10. During a preoperative airway assessment, a patient opens their mouth fully. The soft palate and base of the uvula are visible, but the **tonsillar pillars and most of the uvula are not seen**. What is the MOST appropriate Mallampati classification?



- A. Mallampati I
- B. Mallampati II
- C. Mallampati III
- D. Mallampati IV

Correct Answer: C — Only the base of the uvula is visible → Mallampati III.

11. The PRIMARY purpose of preoxygenation before induction of anesthesia is to:
- A. Increase minute ventilation
 - B. Replace nitrogen in the lungs with oxygen to create an oxygen reservoir
 - C. Increase cardiac output
 - D. Reduce the MAC of volatile anesthetics

Correct Answer: B

12. Preoxygenation is MOST effective when the patient:
- A. Takes eight deep breaths over 30 seconds
 - B. Breathes 100% oxygen for 3 minutes with a tight-fitting mask
 - C. Breathes room air until induction
 - D. Lies in steep Trendelenburg

Correct Answer: B

13. Which of the following BEST defines a classical rapid sequence induction?
- A. Preoxygenation → induction agent → mask ventilation → relaxant → intubation
 - B. Preoxygenation → induction agent → *no mask ventilation* → relaxant → intubation
 - C. Preoxygenation → sevoflurane → mask ventilation → intubation
 - D. Induction agent → cricoid pressure → mask ventilation → intubation

Correct Answer: B

14. The purpose of cricoid pressure during RSI is to:
- A. Improve direct laryngoscopy view
 - B. Prevent laryngospasm
 - C. Occlude the esophagus to reduce passive regurgitation
 - D. Prevent gastric insufflation

Correct Answer: C

15. Which of the following patients is MOST appropriately managed with **RSI rather than standard induction**?
- A. Elective hernia repair patient who is fully fasted
 - B. Patient with suspected bowel obstruction and severe nausea
 - C. Non-pregnant female with GERD
 - D. Patient with mild asthma and 8-hour NPO time

Correct Answer: B

16. The **BURP maneuver** is used during difficult laryngoscopy to:
- A. Prevent aspiration by compressing the esophagus
 - B. Improve mask ventilation by lifting the epiglottis
 - C. Improve visualization of the glottic opening by repositioning the larynx
 - D. Increase cricoid pressure to occlude the esophagus

Correct Answer: C

17. During mechanical ventilation after intubation, you hear **absent breath sounds on the left**, with high peak pressures. The MOST appropriate immediate action is:
- A. Increase tidal volume
 - B. Withdraw the ETT until bilateral breath sounds return
 - C. Push the ETT further down to bypass obstruction
 - D. Administer bronchodilators

Correct Answer: B. This scenario indicates a likely right main stem placement of the ETT. The next best step is to withdrawal the ETT until bilateral breath sounds return.

18. You insert the spinal needle at L3–L4 but get bone contact early. What is the MOST appropriate next step?
- A. Withdraw slightly and redirect cephalad (towards the head)
 - B. Push harder
 - C. Change to a larger spinal needle
 - D. Switch immediately to general anesthesia

Correct Answer: A

19. Hypotension after spinal anesthesia is primarily caused by:
- A. Myocardial depression
 - B. Loss of sympathetic tone leading to vasodilation
 - C. Excessive CSF drainage
 - D. Hypoxia

Correct Answer: B

20. During direct laryngoscopy the vocal cords are not visible. Which adjustment is MOST likely to improve the view?
- A. Lower the head and extend the neck further
 - B. Realign the patient so the external auditory canal or the tragus matches the sternal notch

- C. Rotate the head to the dominant side
- D. Insert a Guedel or oral airway device

Correct Answer: B — Proper alignment significantly improves laryngoscopic view.

21. During mechanical ventilation of a healthy adult undergoing general anesthesia, the *typical* tidal volume used in lung-protective ventilation is:

- A. 2–3 mL/kg
- B. 4–6 mL/kg
- C. 6–8 mL/kg
- D. 10–12 mL/kg

Correct Answer: C

22. A patient becomes hypotensive after spinal anesthesia. Which drug corrects hypotension by **increasing venous return and systemic vascular resistance without increasing heart rate**?

- A. Ephedrine
- B. Epinephrine
- C. Noradrenaline
- D. Phenylephrine

Correct Answer: D. Phenylephrine is the most appropriate choice due to its pure alpha 1 agonism. This causes isolated vasoconstriction, which means it is most likely to cause reflex bradycardia.

23. Ephedrine raises blood pressure primarily by:

- A. Pure alpha-1 agonism
- B. Direct beta-1 agonism only
- C. Releasing endogenous norepinephrine and mild direct stimulation
- D. Pure beta-2 agonism

Correct Answer: C

24. Cerebral autoregulation maintains constant cerebral blood flow (CBF) across which approximate mean arterial pressure (MAP) range in a healthy adult?

- A. 20–60 mmHg
- B. 40–80 mmHg
- C. 50–150 mmHg
- D. 80–200 mmHg

Correct Answer: C

25. In a patient with long-standing hypertension, the autoregulatory curve shifts:
- A. Left, increasing tolerance to low MAP
 - B. Right, increasing the lower and upper MAP limits
 - C. Downward, reducing baseline CBF
 - D. It does not shift

Correct Answer: B

26. In TBI, cerebral autoregulation is often:
- A. Completely intact
 - B. Partially impaired or absent, leading to pressure-passive CBF
 - C. Shifted far to the right
 - D. Unaffected by MAP or ICP changes

Correct Answer: B

27. The patient is a 35yo female G2P1 at 39 weeks and 1 day who is otherwise healthy and is scheduled for a C-section. She weighs 60kg; therefore, her hourly maintenance fluid rate is therefore 100mL/hr. She has been NPO for 8 hours, and her C-section will take 2 hours. How much total volume of fluid should you expect to give her to account for both NPO and surgical time?
- A. 600 mL
 - B. 800 mL
 - C. 1000 mL
 - D. 1200 mL

Correct Answer: C, 1000mL.

100mL/hr x 8 hours = 800mL

100mL/hr x 2 hours = 200mL

800mL + 200mL = 1000mL

28. Which clinical sign is consistent with **Stage I anesthesia (Analgesia/Disorientation)**?
- A. Pupils fixed and dilated
 - B. Loss of eyelash reflex
 - C. Intact airway reflexes
 - D. Breath-holding and rigidity

Correct Answer: C

29. The MAIN clinical concern during Stage II of anesthesia is:
- A. Severe hypotension
 - B. Vomiting and aspiration
 - C. Hypertension and tachycardia only
 - D. Hypothermia

Correct Answer: B — Laryngospasm, vomiting, aspiration risk ↑.

30. A patient in Stage II begins to **laryngospasm**. This is because Stage II is characterized by:
- A. Maximum muscle relaxation
 - B. Hyperreactive airway reflexes
 - C. Complete suppression of sympathetic tone
 - D. Loss of all reflex activity

Correct Answer: B

31. Which is the MOST appropriate criterion before extubating a patient?
- A. SpO₂ > 90% with 10 L/min O₂
 - B. Regular respirations with adequate tidal volume
 - C. Any spontaneous breathing effort
 - D. Patient not moving

Correct Answer: B

32. The jaw thrust maneuver improves airway patency during anesthesia by:
- A. Tilting the head backward to straighten the airway
 - B. Lifting the mandible forward to displace the tongue anteriorly away from the posterior pharyngeal wall
 - C. Increasing lung volumes by expanding the chest wall
 - D. Applying downward pressure on the angles of the mandible to stimulate breathing

Correct Answer: B

33. Which sign indicates a patient has safely passed from Stage II into Stage III of anesthesia?
- A. Return of spontaneous movement
 - B. Apnea
 - C. Loss of eyelash reflex with onset of regular respirations
 - D. Loud snoring respirations

Correct Answer: C

34. During MAC, a patient becomes difficult to arouse but responds purposefully to repeated or painful stimulation. This corresponds to which level of sedation?
- A. Minimal sedation
 - B. Moderate sedation
 - C. Deep sedation
 - D. General anesthesia

Correct Answer: C — Deep sedation.

35. Which of the following situations MOST strongly requires **immediate conversion to general anesthesia** during a MAC case?

- A. Patient is lightly snoring
- B. Surgeon needs more muscle relaxation
- C. Persistent airway obstruction despite jaw thrust
- D. Mild hypertension

Correct Answer: C

Pain Management – Multiple Choice

36. Allodynia is defined as:
- A. Pain due to a normally painful stimulus
 - B. Pain that radiates along a dermatome
 - C. Pain triggered by a stimulus that is normally non-painful
 - D. Exaggerated response to a painful stimulus

Correct Answer: C

37. Which BEST describes **nociceptive pain**?
- A. Pain caused by direct stimulation of nerve roots
 - B. Pain caused by abnormal central processing
 - C. Pain caused by tissue damage activating nociceptors
 - D. Pain with no identifiable physical cause

Correct Answer: C

38. Which of the following is the BEST example of **referred pain**?
- A. Pain along a dermatome in herpes zoster
 - B. Shoulder pain caused by diaphragmatic irritation
 - C. Pain from a broken rib during coughing
 - D. Severe tenderness directly over the appendix

Correct Answer: B — Diaphragmatic irritation (phrenic nerve, C3–C5) refers pain to the shoulder.

39. Which BEST describes the principle behind multimodal analgesia?
- A. Using high doses of a single analgesic to achieve maximal effect
 - B. Combining different classes of analgesics to target multiple pain pathways
 - C. Avoiding opioids entirely in postoperative pain control
 - D. Using only non-pharmacologic pain techniques

Correct Answer: B

40. Which drug–mechanism pair is correctly matched?
- A. NSAIDs — inhibit COX enzymes to decrease prostaglandins
 - B. Ketamine — enhances GABA activity

- C. Morphine — blocks NMDA receptors
- D. Lidocaine — blocks dopamine pain receptors

Correct Answer: A

41. Why is regional anesthesia considered a key component of multimodal analgesia?
- A. It eliminates the need for general anesthesia
 - B. It provides long-term sedation
 - C. It blocks painful input before it reaches the spinal cord, reducing central sensitization
 - D. It increases the required dose of systemic analgesics

Correct Answer: C

42. While under general anesthesia, a patient begins to show **increased heart rate and blood pressure** shortly after surgical incision. This MOST likely indicates:
- A. Hypothermia
 - B. Inadequate neuromuscular blockade
 - C. Inadequate analgesia
 - D. Hyperventilation

Correct Answer: C

43. The patient is a 21yo male with PMHx severe kidney disease who presents with abdominal pain, found to have appendicitis, and is now seen for an appendectomy. Post-operatively, he reports 9/10 pain despite multiple IV morphine boluses. HR is 120, BP 160/95, and he appears agitated. The BEST next step is:
- A. Increase morphine boluses indefinitely
 - B. Add ketamine
 - C. Add an NSAID
 - D. Perform a spinal

Correct Answer: B

44. Which of the following opioid side effects is MOST clinically dangerous in the PACU?
- A. Pruritus
 - B. Urinary retention
 - C. Respiratory depression
 - D. Constipation

Correct Answer: C

45. A standard bilateral TAP block MOST reliably provides analgesia for which dermatomal distribution?
- A. T2–T6
 - B. T4–T10

- C. T6–L1
- D. L2–L4

Correct Answer: C