

University of Global Health Equity Undergraduate (MBBS) Anaesthesia and Critical Care Curriculum Development

The University of Global Health Equity is a new health sciences university in Rwanda, with a campus located in Butaro, Burera District, Northern Province. Committed to equity in education and healthcare, UGHE seeks to build the next generation of global health leaders, and currently runs two programs, a Master in Global Health Delivery (MGHD) and a Bachelor in Medicine and Surgery (MBBS).

As part of UGHE's growth and commitment to advancing health equity in Rwanda and beyond, the Centre for Equity in Global Surgery at UGHE is building a curriculum for undergraduate anaesthesia and critical care training that targets competencies needed to support practice by both physician and non-physician anaesthesia providers in rural districts on graduation. The curriculum will be delivered to students in their 4th year (2nd clinical year) of a 6 year program. As anaesthesia and critical care are an essential part of safe surgical access in rural Africa, our program is being built as a practice-oriented and innovative training curriculum, with emphasis on the acquisition of applicable skills. We also aim to inspire students to pursue a career in anaesthesia and critical care specialty training on graduation.

As part of the curriculum development process, we are undertaking a modified Delphi process with input from anaesthesia and critical care experts from across Africa. This online survey comprises the first stage of this Delphi process and we would be sincerely grateful for your input to this process. Completion of this survey will take an estimated 15-20 minutes.

Email addresses will be used to distribute further rounds of our Delphi survey process. We also aim to publish the results of our Delphi process and to acknowledge all respondents who complete both rounds of surveys as co-authors. Please indicate below if you wish to be acknowledged in this way.

Thank you. We are looking forward to your expert contributions.

Research Information Sheet (please read)

[Attachment: "Research Information Sheet - Boston Childrens Hospital.pdf"]

Section I: DEMOGRAPHIC DATA

Please note that the below demographic details are being collected to allow the Delphi working group to understand the distribution of opinions we are collecting. All demographic information will be entirely de-identified from the answers given so that your answers remain anonymous.

Email address:

In what country did you undertake your anaesthesia and critical care specialty training?

In what country do you primarily practice?

In what domain do you primarily work?

- ☐ University teaching hospital
- ☐ Public referral hospital
- ☐ Public district general hospital
- ☐ Private hospital
- ☐ Other

Please specify other:

How many years have you been practicing as an independent anaesthesia and critical care practitioner?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10+

Do you have additional subspecialty anaesthesia and critical care training?

- ☐ Yes
- ☐ No

Please specify subspecialty:

Do you wish to be acknowledged as a co-author in any future publications of the results of this Delphi process? Please note that co-authorship will only be given to those who complete both rounds of surveys.

- ☐ Yes
- ☐ No

If yes, please provide your name (first and last) for publication:

Section II: CURRICULUM EXPECTATIONS

Please RANK the following expected outcomes from a 4-week medical school anaesthesia and critical care curriculum in terms of IMPORTANCE, 1 being most important and 4 being least important. Each value (1-4) can be used only once.

		1 (most important)	2	3	4 (least important)
1	Inspire medical students to undertake specialty training in anaesthesia and/or critical care on graduation	☐	☐	☐	☐
2	Equip medical students with the knowledge required to understand the role of the anaesthesia and critical care provider	☐	☐	☐	☐
3	Equip medical students with the knowledge and skills required to support trained anaesthesia and critical care providers	☐	☐	☐	☐
4	Equip medical students with the knowledge and skills required to independently perform anaesthesia and critical care in rural settings	☐	☐	☐	☐

Section II: CURRICULUM EXPECTATIONS CONTINUED

Please **RANK** the following expected outcomes from a 4-week medical school anaesthesia and critical care curriculum in terms of **ACHIEVABILITY**, 1 being most achievable and 4 being least achievable. Each value (1-4) can be used only once.

	1 (most important)	2	3	4 (least important)
1 Inspire medical students to undertake specialty training in anaesthesia and/or critical care on graduation	☐	☐	☐	☐
2 Equip medical students with the knowledge required to understand the role of the anaesthesia and critical care provider	☐	☐	☐	☐
3 Equip medical students with the knowledge and skills required to support trained anaesthesia and critical care providers	☐	☐	☐	☐
4 Equip medical students with the knowledge and skills required to independently perform anaesthesia and critical care in rural settings	☐	☐	☐	☐

Section III: MODE OF DELIVERY

In an ideal scenario (i.e. not faced with resource limitations), please RANK the following modes of teaching in terms of EFFECTIVENESS in delivering a 4-week medical student anaesthesia and critical care curriculum, 1 being the most effective and relevant and 4 being the least effective and relevant. Each value (1-4) can be used only once.

		1 (most important)	2	3	4 (least important)
1	Didactic lectures	☐	☐	☐	☐
2	Interactive sessions eg seminars, tutorials, case-based learning etc	☐	☐	☐	☐
3	Simulation based training	☐	☐	☐	☐
4	Clinical placements	☐	☐	☐	☐

Section IV: CURRICULUM DURATION

1

In an ideal scenario, what duration do you believe a medical student anaesthesia and critical care curriculum should be?

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

☐ 8

(weeks)

2

For this ideal scenario, what percentage of time should be spent on:

Anaesthesia

☐ 25

☐ 50

☐ 75

☐ 100

(%)

Critical Care

☐ 25

☐ 50

☐ 75

☐ 100

(%)

Total %

Your selections must equal 100%.

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

ANATOMY PRINCIPLES

	Less important	Somewhat important	Very important	Essential
Airway anatomy	☐	☐	☐	☐
Cardiovascular anatomy	☐	☐	☐	☐
Respiratory anatomy	☐	☐	☐	☐
Renal anatomy	☐	☐	☐	☐
Neuroanatomy	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

PHYSIOLOGY PRINCIPLES

		Less important	Somewhat important	Very important	Essential
1	Cardiovascular physiology	☐	☐	☐	☐
2	Respiratory physiology	☐	☐	☐	☐
3	Renal physiology	☐	☐	☐	☐
4	Fluid balance and electrolytes	☐	☐	☐	☐
5	Acid-base physiology	☐	☐	☐	☐
6	Neurophysiology	☐	☐	☐	☐
7	Neuroendocrine response to surgery	☐	☐	☐	☐
8	Autonomic nervous system	☐	☐	☐	☐
9	Pain pathways	☐	☐	☐	☐
10	Nutrition & nutritional assessment	☐	☐	☐	☐
11	Measurement of blood glucose	☐	☐	☐	☐
12	Interpretation of standard laboratory blood results	☐	☐	☐	☐
13	Interpretation of electrocardiogram	☐	☐	☐	☐
14	Pregnancy physiology	☐	☐	☐	☐
15	Paediatric physiology	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

PRINCIPLES IN MANAGEMENT OF ABNORMAL PHYSIOLOGY

		Less important	Somewhat important	Very important	Essential
1	Airway obstruction - diagnosis and management	☐	☐	☐	☐
2	Circulation management	☐	☐	☐	☐
3	Arrhythmias	☐	☐	☐	☐
4	Advanced Life Support and cardiopulmonary resuscitation	☐	☐	☐	☐
5	Paediatric Life Support	☐	☐	☐	☐
6	Advanced Trauma Life Support	☐	☐	☐	☐
7	Acute and chronic pain	☐	☐	☐	☐
8	Arterial blood gas analysis and interpretation	☐	☐	☐	☐
9	Post-Operative Nausea and Vomiting (PONV)	☐	☐	☐	☐
10	Surgical Site Infections	☐	☐	☐	☐
11	Management of abnormal blood glucose	☐	☐	☐	☐
12	Airway obstruction in children	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

EQUIPMENT AND PHYSICS PRINCIPLES

		Less important	Somewhat important	Very important	Essential
1	Principles of ultrasound scanning	☐	☐	☐	☐
2	Airway equipment	☐	☐	☐	☐
3	Breathing systems (Mapleson's and circle)	☐	☐	☐	☐
4	Administering oxygen	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

PHARMACOLOGY PRINCIPLES

		Less important	Somewhat important	Very important	Essential
1	Intravenous induction agents	☐	☐	☐	☐
2	Volatile anaesthetics	☐	☐	☐	☐
3	Ketamine	☐	☐	☐	☐
4	Muscle relaxants	☐	☐	☐	☐
5	Reversal agents ie neostigmine	☐	☐	☐	☐
6	Intravenous fluids	☐	☐	☐	☐
7	Opioids	☐	☐	☐	☐
8	Clonidine	☐	☐	☐	☐
9	Tramadol	☐	☐	☐	☐
10	Paracetamol/Acetaminophen	☐	☐	☐	☐
11	Non-Steroidal Anti-Inflammatory Drugs	☐	☐	☐	☐
12	Local anaesthetics	☐	☐	☐	☐
13	Pre-medication	☐	☐	☐	☐
14	Drugs acting on the autonomic nervous system including Adrenaline	☐	☐	☐	☐
15	Antibiotics	☐	☐	☐	☐
16	Anti-emetics	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

ANAESTHESIA PRINCIPLES - GENERAL PRE-OPERATIVE

		Less important	Somewhat important	Very important	Essential
1	General anesthesia overview (hypnosis/analgesia/relaxation)	☐	☐	☐	☐
2	Pre-morbid conditions (diabetes, obesity, ischaemic heart disease, chronic obstructive pulmonary disease, chronic kidney disease etc)	☐	☐	☐	☐
3	Pre-operative assessment and evaluation	☐	☐	☐	☐
4	Pre-operative optimization	☐	☐	☐	☐
5	Fasting guidelines	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

ANAESTHESIA PRINCIPLES - GENERAL INTRAOPERATIVE

		Less important	Somewhat important	Very important	Essential
1	Airway assessment	☐	☐	☐	☐
2	Patient positioning	☐	☐	☐	☐
3	Keeping a patient warm	☐	☐	☐	☐
4	Basic airway management (airway manoeuvres etc)	☐	☐	☐	☐
5	Tracheal intubation	☐	☐	☐	☐
6	Venous access - peripheral venous line	☐	☐	☐	☐
7	Venous access - central venous line	☐	☐	☐	☐
8	Venous access - arterial line	☐	☐	☐	☐
9	Perioperative medicine	☐	☐	☐	☐
10	Perioperative care	☐	☐	☐	☐
11	Rapid Sequence Induction (indication and procedure)	☐	☐	☐	☐
12	Total Intravenous Anaesthesia (TIVA)	☐	☐	☐	☐
13	Monitoring - heart rate, blood pressure, oxygen saturations, ventilation, temperature, depth of anaesthesia	☐	☐	☐	☐
14	End tidal carbon dioxide	☐	☐	☐	☐
15	Mechanical ventilation	☐	☐	☐	☐
16	Invasive monitoring	☐	☐	☐	☐
17	Care of the unconscious patient	☐	☐	☐	☐
18	Intra-operative complications	☐	☐	☐	☐
19	Spinal anaesthesia	☐	☐	☐	☐
20	Epidural anaesthesia	☐	☐	☐	☐
21	Brachial plexus block	☐	☐	☐	☐
22	Ring blocks	☐	☐	☐	☐
23	Haematoma blocks	☐	☐	☐	☐
24	Bier's blocks	☐	☐	☐	☐
25	Femoral nerve/Fascia-Iliaca blocks	☐	☐	☐	☐
26	Other peripheral nerve blocks	☐	☐	☐	☐

27

Blood transfusions - components
and indications



28 Blood transfusions - reactions



29 Management of anaesthetic
emergencies (Malignant
Hyperpyrexia, Local Anaesthetic
Toxicity, Can't Intubate Can't
Oxygenate)



Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

ANAESTHESIA PRINCIPLES - GENERAL POSTOPERATIVE

		Less important	Somewhat important	Very important	Essential
1	Emergence from anesthesia	☐	☐	☐	☐
2	PACU assessment	☐	☐	☐	☐
3	PACU complications	☐	☐	☐	☐
4	Infection control	☐	☐	☐	☐
5	Promoting recovery/ERAS	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

ANAESTHESIA PRINCIPLES - SUBSPECIALTIES

		Less important	Somewhat important	Very important	Essential
1	Principles of paediatric anaesthesia	☐	☐	☐	☐
2	Principles of neonatal anaesthesia	☐	☐	☐	☐
3	Principles of obstetric anaesthesia	☐	☐	☐	☐
4	Principles of cardiothoracic anaesthesia	☐	☐	☐	☐
5	Principles of neuro anaesthesia	☐	☐	☐	☐
6	Principles of orthopaedic anaesthesia	☐	☐	☐	☐
7	Principles of ENT anaesthesia	☐	☐	☐	☐
8	Paediatric complications	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

ANAESTHESIA PRINCIPLES - MISCELLANEOUS

		Less important	Somewhat important	Very important	Essential
1	Safety/systems (eg stop before you block, WHO checklist, consent etc)	☐	☐	☐	☐
2	Global Surgery and anaesthesia	☐	☐	☐	☐
3	Non-technical skills (communication, leadership, situational awareness, teamwork, prioritisation etc)	☐	☐	☐	☐
4	History of surgery and anaesthesia	☐	☐	☐	☐
5	Consent and ethics	☐	☐	☐	☐
6	Managing risk	☐	☐	☐	☐
7	Controlled substance handling	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following topics are important for inclusion in an anaesthesia and critical care curriculum for medical students.

CRITICAL CARE PRINCIPLES

		Less important	Somewhat important	Very important	Essential
1	Palliative care and end-of-life care	☐	☐	☐	☐
2	Treatment limitations and withdrawal of life sustaining care	☐	☐	☐	☐
3	Turning an immobilized patient	☐	☐	☐	☐
4	C-spine immobilization	☐	☐	☐	☐
5	Ventilator modes/management	☐	☐	☐	☐
6	Nutrition in ICU	☐	☐	☐	☐
7	Bowel care in ICU	☐	☐	☐	☐
8	Prevention of delirium	☐	☐	☐	☐
9	Recognition of the critically ill or deteriorating patient	☐	☐	☐	☐
10	Management of the trauma patient	☐	☐	☐	☐
11	Head injuries and their management	☐	☐	☐	☐
12	Reduced Glasgow Coma Scale (GCS)	☐	☐	☐	☐
13	Transplant and organ donation	☐	☐	☐	☐
14	Hypotension	☐	☐	☐	☐
15	Hypertension	☐	☐	☐	☐
16	Shock	☐	☐	☐	☐
17	Sepsis	☐	☐	☐	☐
18	Organ failure and organ support	☐	☐	☐	☐
19	Burns and resuscitation	☐	☐	☐	☐
20	Hypoxia	☐	☐	☐	☐
21	Respiratory failure	☐	☐	☐	☐
22	Seizures	☐	☐	☐	☐

Section V: MEDICAL SCHOOL CURRICULUM - DELPHI SURVEY CONTINUED

Please indicate below the extent to which you believe the following **SKILLS** are important for inclusion in a 4-week anaesthesia and critical care curriculum for medical students.

SKILLS TO ACQUIRE

		Less important	Somewhat important	Very important	Essential
1	Peripheral IV line	☐	☐	☐	☐
2	Intubation	☐	☐	☐	☐
3	Arterial line	☐	☐	☐	☐
4	Central line	☐	☐	☐	☐
5	Epidurals	☐	☐	☐	☐
6	Spinals	☐	☐	☐	☐
7	Bag mask ventilation	☐	☐	☐	☐
8	Insertion of oropharyngeal	☐	☐	☐	☐
9	airway Insertion of nasopharyngeal airway	☐	☐	☐	☐
10	Insertion of Laryngeal Mask Airway	☐	☐	☐	☐
11	ECG interpretation	☐	☐	☐	☐
12	Patient positioning	☐	☐	☐	☐
13	Parenteral drug constitution and administration	☐	☐	☐	☐
14	Intramuscular drug	☐	☐	☐	☐
15	administration Subcutaneous drug	☐	☐	☐	☐
16	administration Patient moving and handling	☐	☐	☐	☐
17	Use of IV anaesthetic agents	☐	☐	☐	☐
18	Calculation and administration of emergency drugs	☐	☐	☐	☐
19	Intraosseous access	☐	☐	☐	☐

Section VI: FINAL QUESTIONS/COMMENTS

- 1 Are there any additional knowledge topics or skills that you think should be included in the medical student anaesthesia curriculum? Please describe here.
- 2 Do you have any questions/comments you'd like to be considered? Please describe here.