Paediatric Anaesthesia Course
Masaka, Uganda
19 - 21 January 2015
22 - 24 January 2015

Uganda Society of Anaesthesia
Association of Anesthesiologists of Uganda
Association of Anaesthetists of Great Britain and Ireland
World Federation of Societies of Anaesthesiologists
Executive Summary

• The SAFE (Safer Anaesthesia From Education) Paediatric Anaesthesia Course short course is a structured refresher training course in paediatric anaesthesia for anaesthesia nurses, anaesthetic officers and physician anaesthetists working in low- and middle-income countries. The Uganda Society of Anaesthesia, the Association of Anaesthetists of Great Britain and Ireland (AAGBI) and the World Federation of Societies of Anaesthesiologists (WFSA) piloted the course in Uganda in July 2014.

• This is the report of the second pilot courses in January 2015, funded by the WFSA and the AAGBI.

• The course directors were Dr Joseph Kyobe Kiwanuka (Mbarara) and Dr Isabeau Walker (AAGBI/WFSA). Administrative assistance was provided by the AAGBI secretariat in London.

• 8 UK physician anaesthetists, 1 paediatrician and 11 Ugandan physician anaesthetists acted as facilitators for the courses. The UK faculty included 3 long-term volunteers funded by the Sustainable Volunteering Project\(^1\) who were working at Fort Portal Hospital and Mbale Regional Referral Hospital.

• 71 anaesthetic officers completed the three-day training course. Delegates were from regional referral hospitals and health centres from all regions of Uganda.

• Each delegate received a copy of the SAFE participant manual, a memory stick containing the course materials and training videos, and a SAFE paediatric and obstetric pocket handbook.

• Feedback from the delegates was excellent.

• Knowledge and clinical skills were formally assessed before and after the course and showed statistically significant improvements.

• Monitoring and evaluation will be undertaken by the UK SVP volunteers and the Ugandan faculty members who will visit the anaesthetic officers in their hospitals. This will include an informal interview a repeat of the skills assessment and MCQ and review of logbooks.

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\(^1\)The SVP is hosted by the Liverpool-Mulago-Partnership and promotes volunteering throughout the Ugandan Maternal and Newborn Hub (www.LMPcharity.org)
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Acknowledgements
We would like to thank the Association of Anaesthetists of Great Britain and Ireland (AAGBI) and the World Federation of Societies of Anaesthesiologists (WFSA) for their financial support for the SAFE Paediatric Anaesthesia pilot courses.

We would like to thank all the anaesthetists who have been involved in writing this course material - without their efforts, this course would not have been possible. In particular, we would like to acknowledge Benoit Beauve, Anthony Bradley, Faye Evans, Paul Firth, Elaine Ng, Judith Nolan, Philippa Seal, Jonathan Smith, Kate Wilson, Michelle White and Isabeau Walker. Also to Dr Ollie Ross, Louise Bates, Erica Dibb-Fuller and colleagues at the Shackleton Department of Anaesthesia and the Learning Support Department at University Hospital Southampton NHS Foundation Trust who developed the video materials for the course. With grateful thanks to the patients and staff who kindly consented to filming at Southampton General Hospital UK or Tansen Mission Hospital, Nepal, and also to the Nick Simons Institute, Nepal. We are also grateful for contributions from Kester Brown and the Educational Resources Centre at the Royal Children’s Hospital Melbourne and to Medical Aid Films for giving us permission to use their video on Newborn Resuscitation. Also to Mr Bip Nandi and Cyril Goddia from Malawi for sharing their expertise.

We would also like to express our gratitude to Dr Fred Musana, President of the Ugandan Society of Anaesthesia for his support for the course and to Dr Stephen Ttendo for his tireless efforts to improve patient safety in Uganda and to provide educational opportunities for his fellow anaesthetic providers. We would like to say a particular thank-you to Dr Joseph Kiwanuka and Dr George Kateregga who put a phenomenal amount of work into making sure the course ran smoothly, and to Ciara Walker from Manchester Medical School and Cathy Costello from Great Ormond Street Hospital who helped to prepare the course materials in the UK. Thanks also to Kate Thornton and Karin Pappenheim from the AAGBI for their help in the administrative work for the SAFE paediatric course, and to Collaborate: ideas images and Nick Boyd for the course photos.

A special thank-you to Dr Andrew Hartle, President of the AAGBI for his support for the project, and to Dr Iain Wilson who had the original idea to develop the SAFE courses.

A huge thank-you to the faculty (George, Maytinee, Nick, Mary, Janat, Leslie, Andrew, Grant, Alana, Iain, Elizabeth, John Paul, Simon, Denis, Paul, Felix, Cornelius and Adam), and to our administrative supporter (Ciara) - for their hard work, enthusiasm and great camaraderie.
Last but not least, we would like to thank our course delegates for their welcome, friendship and for being such a pleasure to teach and to learn from.

Joseph Kyobe Kiwanuka
Isabeau Walker
Course directors
January 2015
Background

Access to safe surgery is an important component of paediatric practice in low-income countries. More than 50% of the population is under 14 years of age, and it has been estimated that 85% of children will require some sort of surgery before their 15th birthday. In many low-income countries there are few specialist surgeons and anaesthetists, and paediatric surgery and anaesthesia are of necessity the work of the general surgeon and non-physician anaesthetist in the district hospital. Children require surgery for a range of congenital conditions including surgery for cleft lip and palate, and increasingly, for traumatic injury resulting from burns or road traffic accidents. Anaesthetists provide anaesthesia, pain relief and intravenous fluid management for care for children undergoing surgery. The role of the anaesthetist also extends beyond the operating theatre to include initial resuscitation and basic critical care for seriously ill children.

Children present particular challenges to surgeons and anaesthetists, and providing anaesthesia and basic critical care for essential surgery in children requires specific knowledge, skills and training. Application of well-established principles, particularly with respect to perioperative care and postoperative pain control, has the potential to relieve unnecessary suffering in many children.

The Association of Anaesthetists of Great Britain and Ireland (AAGBI) and the World Federation of Societies of Anaesthesiologists (WFSA) developed the SAFE Paediatric Anaesthesia course in 2014 to meet the challenge of providing safe anaesthesia care for children in the district hospital. The aim of the course is to provide refresher training for both physician and non-physician anaesthetists rather than as a comprehensive training course in anaesthesia.

The teaching materials and standard operating procedures are based on the concept of the ‘SAFE’ courses designed for the AAGBI by Kate Grady. Evidence from the literature and feedback from surgeons and anaesthetists in Uganda and Malawi was used to ensure that the course is clinically relevant and would improve the practice of anaesthesia for children to a safe standard.

The course materials were written by specialist paediatric anaesthetists from the UK, Canada and the USA on behalf of the AAGBI and the WFSA, and included representatives of Mercy Ships and the Society of Pediatric Anesthesia. The course includes sessions on basic paediatric anaesthesia, pain management, fluid resuscitation, trauma and common conditions of childhood, as well as newborn and paediatric life support. There are six brief lectures and the rest of the course is run as modular breakout sessions. The participants are divided into four pre-allocated small groups and the groups rotate around four sessions for each course module. The course recognises the specific needs of the adult learner and comprises a range of teaching modalities including skill stations, scenarios, demonstrations, discussions,
workshops, DVDs, and interactive lectures, and is supported by a facilitator manual and a participant manual. Each session has guidance on the learning objectives to be achieved. The course manual contains teaching laminates required for the course, and printouts of the lectures and slide presentations used in the breakout sessions.

The course materials were modified after piloting in Uganda in July 2014. The first pilot course also led to the development of the *SAFE Paediatric and Obstetric Pocket Handbook*, containing drug doses and protocols written by Nick Boyd and Maytinee Lilaonitkul and published by the WFSA. The handbook was distributed to all the course participants with the course manual and a memory stick containing all the course materials and videos.

Isabeau Walker
January 2015
This was the second pilot of the SAFE paediatric anaesthesia course, and the 8th ‘SAFE’ anaesthesia course run in collaboration between the Uganda Society of Anaesthesia, and the Association of Anaesthetists of Great Britain and Ireland since 2011, and with the newly formed Association of Anesthesiologists of Uganda.

The training was run as two back-to-back three-day courses 19th -21st January and 22nd-24th January 2015. A total of 71 delegates completed the two courses.

**Logistics and funding**

The SAFE course materials were all reviewed after the first pilot course and were edited by Faye Evans, Maytinee Lilaonitkul, Michelle White and Isabeau Walker after discussions during the faculty meetings in July 2014. Isabeau Walker collated the input and put together the final version of the facilitator and participant manuals. Updated teaching materials were e-mailed to the Uganda faculty in advance of the course.

Teaching materials, which included 100 copies of the participant manual, participant assessments and feedback forms, 100 laminates (basic life support and newborn life support algorithms) and 20 copies of the facilitator manual were prepared in the UK by Cathy Costello and Isabeau Walker at Great Ormond Street Hospital. Stationary (including whiteboard rolls and markers) and delegate bags were provided by the AAGBI. Two infant manikins and one child manikin were borrowed from Great Ormond Street Hospital and Ninewells Hospital Dundee. The SAFE paediatric and obstetric drug doses pocket handbook was printed in London by Photolit Printers, funded by the WFSA Publications Committee. The international faculty had charity flights so
had sufficient luggage allowance for materials, which were transported in 4x 64L plastic boxes. Certificates and logbooks were printed locally.

All participants received a copy of the SAFE Paediatric and Obstetric Anaesthesia Pocket Handbook, a copy of the course manual, the basic life support and neonatal resuscitation laminates and an 8G memory stick containing the course materials and the videos. AAGBI delegate bags were used for the first course (from the AAGBI Winter Scientific Meeting).

Dr Ttendo contacted hospital superintendents to encourage them to release the anaesthetic officers to attend the training course, which was advertised through the USoA networks. Approximately 60 course participants were expected; in the end, a total of 71 anaesthetic officers were able to attend.

A grant was received from the AAGBI and the WFSA to support flights for the international faculty and local course expenses. Hospital superintendents were asked to fund bus fares for the course participants, and the AAGBI/WFSA funded the meals and accommodation for the participants for a maximum of four nights to facilitate travel to and from the venue for those travelling long distances.

Funding from the AAGBI/WFSA was also used for the faculty accommodation and meals and for the venue hire. No per diems were paid to faculty members or to course participants. Separate funding from the AAGBI was used for the book donation and for the development of video materials.

**Venue**

The course was held at the Hotel Maria Flo in Masaka, as for previous courses. The lectures were held in the hotel conference room, and the breakout sessions were held in small marquees in the hotel grounds. Audio support was available in the conference room. An LCD projector was borrowed from the anaesthesia department of Mbarara University of Science and Technology. White boards and marker pens were available in the marquees, provided by the AAGBI. The faculty used personal laptops during breakout sessions for videos.
Accommodation for the participants and the faculty was provided in the Hotel Maria Flo or in a local guesthouse with a shuttle bus provided to the venue. All meals were served at the Maria Flo, including breakfast. The support for the course by the hotel was outstanding and allowed the sessions to start on time with regular breaks for refreshments.

The course
The aim of the course was two-fold – firstly as part of the annual CPD for anaesthetic officers to improve knowledge, skills and attitudes required to deliver safe paediatric anaesthesia care, secondly as a pilot to modify and improve the course materials and curriculum based on feedback from the course participants and on detailed feedback from the faculty members.

Dr Joseph Kiwanuka introduced the course and led daily feedback sessions with the participants and the faculty. The faculty members were helped to keep to time by giving 10-minute and 5-minute warnings before the end of the session. A number of sessions included a ‘working tea’ to maximise training time, which allowed us to finish on time everyday, despite a packed daily schedule.

As for previous SAFE courses, a prize essay competition was held, which also enabled the facilitators to learn more about the clinical conditions faced by the anaesthetic officers. The titles included: ‘My most memorable case’, ‘A child we saved because we did the right thing’, ‘A child who died who should have survived’, ‘A child who was saved by the Lifebox pulse oximeter’.

The course lectures were as follows:
- Introduction to the SAFE course
- Overview of paediatric anaesthesia
- Safety in paediatric anaesthesia
- Recognition of the sick child
- Trauma in children
- Newborn care.

The Ugandan anaesthesiologists and postgraduate trainees delivered the lectures, mentored by members of the UK faculty before delivery, with feedback from the faculty in the evening. The faculty demonstrated the trauma assessment at the end of the relevant lecture (it was decided there was insufficient time to demonstrate the ‘sick child’ scenario after the lecture). The Medical Aid Films video ‘Newborn Resuscitation’ was shown to all participants during the newborn resuscitation
breakout session.

All course modules were delivered by a member of the international faculty who worked alongside a Ugandan counterpart; the sessions were all repeated, which allowed the local faculty member to take over the role of teacher.

The course modules were as follows:

**Module 1 – Basic Principles of Paediatric Anaesthesia**
- Preoperative assessment
- Basic calculations
- Preoperative preparation and fasting
- Maintenance fluids

**Module 2 – Paediatric Airway**
- Paediatric airway: basic airway management
- Pediatric airway: intubation
- The anaesthetic plan: induction and maintenance
- Extubation

**Module 3 - Pain Management in Children**
- Pain Assessment
- Pain Management
- Regional blocks (local infiltration module)
- Handover and recovery

**Module 4 – Special conditions – Part 1**
- ENT surgery
- Cleft lip and palate
- Eye surgery
- Inhaled foreign body

**Module 5 – Special conditions – Part 2**
- Sickle disease
- Airway emergencies
- Seizures
- Congenital heart disease

**Module 6 – Resuscitation**
- Child Basic Life Support (1)
Module 7 - The sick laparotomy

- Preparation for sick laparotomy; typhoid perforation
- Airway management: sick laparotomy
- Intraoperative management: sick laparotomy
- Post-operative High Dependency Care

Module 8 – Trauma in Children

- Trauma assessment
- Assessment and management of shock in trauma
- Head injury
- Patient transfer

Module 9 – Burns in Children

- Burns: Assessment
- Burns: Size estimation and fluid resuscitation
- Burns: dressing changes and principles of sedation
- Difficult airways in children

Module 10 – Newborns

- Newborn resuscitation (1)
- Newborn resuscitation (2)
- Emergency surgery for newborns
- Pyloric stenosis

Timetable

Two courses were run back-to-back (see table 1), to facilitate best use of the faculty, to keep the group sizes small and to allow as many anaesthetic officers to attend as possible. Members of the faculty were able to move between breakout sessions to assess the overall balance of content. Faculty sessions were held every evening to get feedback on the sessions and to modify them where required, also to feed back comments on the lectures. Modifications were used for the second course. A major change was made to the laparotomy sessions for the second course to avoid repeating learning points between sessions.

A party was held on the last evening of the first course, kindly funded by the Hotel Maria Flo.
Table 1. The faculty timetable

<table>
<thead>
<tr>
<th>Sat 17th January</th>
<th>Sun 18th January</th>
<th>Mon 19th January</th>
<th>Tues 20th January</th>
<th>Wed 21st January</th>
<th>Thurs 22nd January</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flights from UK to Entebbe</td>
<td>Travel to Masaka, Faculty Meeting &amp; preparation of venue. Delegates start to arrive</td>
<td>SAFE course 1 Day 1</td>
<td>Faculty meeting</td>
<td>SAFE course 1 Day 2</td>
<td>Faculty meeting</td>
</tr>
<tr>
<td>Thurs 23rd January</td>
<td>Fri 24th January</td>
<td>Sat 25th January</td>
<td>Sun 26th January</td>
<td>SAFE course 2 Day 1</td>
<td>SAFE course 2 Day 2</td>
</tr>
</tbody>
</table>

SAFE course 1 Day 1
SAFE course 1 Day 2
SAFE course 1 Day 3
SAFE course 2 Day 1
SAFE course 2 Day 2
SAFE course 2 Day 3
Flights from Entebbe to UK
Prizes, certificates
Travel Entebbe

Monitoring and Evaluation

The monitoring and evaluation for the SAFE course is based on the Kirkpatrick model, as follows:

**Level 1:** Reaction and enjoyment – measured by numerical analogue scores

**Level 2:** Change in knowledge – assessed by before and after MCQ test

**Level 3:** Change in skill ability – assessed by before and after skills test

**Level 4:** Change in behaviour and ability in the workplace – recorded through Key Informant Interviews and Focus Group Discussions
**Level 5:** Institutional (and ultimately widespread) change – assessed by analysis of institutional records.

Levels 1 - 3 were assessed during the course (results below). Level 4, ‘change in behaviour and in the workplace’ will be measured by interviewing the anaesthetic officers in their place of work. A structured interview has been designed to elucidate the impact of the course, examples where practice has been changed, and cases where the knowledge gained from the course has been put into practice. The Ugandan residents and AAGBI/SVP volunteers from the Maternal and Newborn Hub who attended the course will undertake this follow-up over the next few months.

**Participant feedback**
The feedback regarding the overall course was extremely positive and encouraging. Modifications to the course have been made in light of the feedback.

**Feedback on individual sessions**

<table>
<thead>
<tr>
<th>SESSION</th>
<th>First course 19th-21st January 2015</th>
<th>Second course 22nd-25th January 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nos. response</td>
<td>Median score (0-10)</td>
</tr>
<tr>
<td>Lecture: The child is not a miniature adult</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Preoperative assessment breakout sessions</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Paediatric airway breakout sessions</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Pain management breakout sessions</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Lecture: Safety in paediatric anaesthesia</td>
<td>22</td>
<td>9.5</td>
</tr>
<tr>
<td>Speciality areas in paediatric anaesthesia breakout sessions</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Emergency surgery breakout sessions</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>Lecture:</td>
<td>23</td>
<td>10</td>
</tr>
</tbody>
</table>
Recognition of the sick child

<table>
<thead>
<tr>
<th>Session</th>
<th>Nos. response</th>
<th>Median score (0-10)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resus breakout sessions</td>
<td>23</td>
<td>10</td>
<td>8-10</td>
</tr>
<tr>
<td>The sick child breakout sessions</td>
<td>24</td>
<td>9.5</td>
<td>8-10</td>
</tr>
<tr>
<td>Lecture: trauma in children</td>
<td>24</td>
<td>9</td>
<td>7-10</td>
</tr>
<tr>
<td>Trauma breakout sessions</td>
<td>24</td>
<td>9</td>
<td>8-10</td>
</tr>
<tr>
<td>Burns in children breakout sessions</td>
<td>24</td>
<td>10</td>
<td>7-10</td>
</tr>
<tr>
<td>Lecture: neonates</td>
<td>24</td>
<td>10</td>
<td>7-10</td>
</tr>
<tr>
<td>Neonates breakout sessions</td>
<td>22</td>
<td>9.5</td>
<td>8-10</td>
</tr>
</tbody>
</table>

Overall evaluation of the course

<table>
<thead>
<tr>
<th>Question</th>
<th>First course 15\textsuperscript{th}-17\textsuperscript{th} July 2014</th>
<th>Second course 19\textsuperscript{th}-21\textsuperscript{st} July 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was the course enjoyable?</td>
<td>24 10 7-10</td>
<td>24 10 7-10</td>
</tr>
<tr>
<td>Did the course improve your knowledge?</td>
<td>24 10 9-10</td>
<td>24 10 9-10</td>
</tr>
<tr>
<td>Do you think the course will change your clinical practice?</td>
<td>24 10 8-10</td>
<td>24 10 8-10</td>
</tr>
<tr>
<td>Was the course relevant to your day to day work?</td>
<td>24 10 8-10</td>
<td>24 10 8-10</td>
</tr>
<tr>
<td>Do you think what you have learned will improve the care you give to</td>
<td>24 10 8-10</td>
<td>24 10 8-10</td>
</tr>
</tbody>
</table>
General feedback comments on the courses 19th-21st and 22nd-24th January 2015

First course 19th-21st January (comments verbatim)

*God bless you*

The course has been very excellent in relation to professional practice; however these courses have to be organised in upcountry as well so that many anaesthetists could have a chance of attending.

*Continue with similar courses. The more training the better for the community, because we serve to preserve and save lives.*

Am grateful for having been apart of this training. Please continue the same.

*Need more time, it was so intensive.*

We are requesting for obstetric training.

*Maintain the spirit*

Just to thank the entire team for the knowledge they have provided to us, And the breakout sessions was the best coz it saved time!

*We get good material and knowledge from this program of SAFE Anaesthesia. I like to invite you in our country, Zanzibar, to help the people of Zanzibar concerning the knowledge of Anaesthesia and resuscitation to be up to date on anaesthesis. Thanks. Welcome Zanzibar*

The course was very good and helpful. It would be good if every anaesthetist go through the same course. Thank you for the knowledge and keep it up. May the good Lord bless you all our facilitators.

*It should be done more often. It should take more than three days.*

It has been so wonderful and interesting. This course has helped me a lot and I request if there is any other opportunity for other courses, please we should be invited and improve on our skills and knowledge.

*It was a very good course. You should continue with the spirit.*
Encourage our medical superintendent to allow us attend such courses and facilitate us with transport. Kamuli General Hospital

*I suggest the team to arrange to go to Zanzibar for every year to do the same thing doing in Uganda. It will helpful applied.*

The second day was very packed and tiresome, maybe sh'd be reduced 20 sessions per day. Thanks.  
*Wonderful but days sh'd be increased to 4 days. Sh'd always be yearly, so that there will be improvement in service delivery.*

I salute you all for offer/sacrifice of your time, heart patience, tolerance to such an intensive/laborious course.  
*Thank you.*

Generally trainers are equipped with knowledge and are willing to give it out freely.  
*Thanks a lot. Twice yearly conferences should be arranged to train more lifesavers.*

This course is very important in our day to day work in the hospital (It improves). It should always continue.  
*Thank you very much. I greatly appreciate.*

Manuals to be given before the course. Maybe a week or month before.  
*Exchange programme for students especially or even workers to see these things practiced and perhaps to have a test of a different working environment.*

You don't have any idea of how much you have rescued me from many problems that I caused already and about to cause. May God bless you mightily especially this very year.

**Second course January 22\(^{nd}\)-24\(^{th}\) (comments verbatim)**

Thanx for the flash disk. Thanx for providing full board. Thanx for the party.  
*Adequate time should be given to this course at least 5 days.*

The time (minutes) for breakout sessions was not enough must especially on the last day. Suggestion if possible another 10-15 minutes would have been added. Thank you.  
*This course was very important, we wish to be extended to many people and how to manage anaesthesia in adult. So plan it in the next course. Otherwise*
big and deep thanks to all the team and all people implemented to finalise still at the end.

I expect you to come for support supervision regularly.

Thank you for all the knowledge that we got. However we need more knowledge on the GA machines in our HC IV setting practically on patients not theory.

It requires refresher courses at least every 6 months because sometimes it takes time to have paediatric cases and lose skills.

Whenever there is an opportunity the training should be shared and involve may be all theatre staff and have midwives trained/attend these workshops.

At least organise other courses of the same but different topics ie SAFE caesarean section neuroanaesthesia, eye etc

These courses are leaving out very important coverage of update on commonly used anaesthetic machines.

**Pre and post course knowledge assessment**

Participants completed a pre-course Multiple Choice Questionnaire (MCQ) as well as a practical skills test in one of four stations (basic life support, intubation, trauma assessment, newborn resuscitation). At the end of the course, participants repeated the MCQ and the same skills test to measure knowledge gained and acquisition of skills.

The pre course assessment was conducted after registration on the first day of the SAFE Paediatric Anaesthesia Course. The post course knowledge assessment was conducted on the last day, following the last breakout session and before the closing ceremony.

61 participants completed both the pre and post course knowledge assessment and skills assessments.

10 participants arrived late so only completed the post course assessment.
Pre and post course knowledge test and skills assessment

Course 1 Mean Scores (MCQ out of 50, skill station out of 10)

<table>
<thead>
<tr>
<th></th>
<th>MCQ</th>
<th>Skill: BLS</th>
<th>Skill: Airway</th>
<th>Skill: Trauma Assessment</th>
<th>Skill: Newborn Resuscitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-course</td>
<td>34.3</td>
<td>4.1</td>
<td>5.5</td>
<td>4.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Post-course</td>
<td>43.2</td>
<td>7.8</td>
<td>7.4</td>
<td>7.3</td>
<td>8.2</td>
</tr>
<tr>
<td>% increase</td>
<td>8.9</td>
<td>37</td>
<td>19</td>
<td>31</td>
<td>44</td>
</tr>
</tbody>
</table>

Table: Course 2 Mean Scores (MCQ out of 50, skill station out of 10)

<table>
<thead>
<tr>
<th></th>
<th>MCQ</th>
<th>Skill: BLS</th>
<th>Skill: Airway</th>
<th>Skill: Trauma Assessment</th>
<th>Skill: Newborn Resuscitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-course</td>
<td>36.0</td>
<td>5.7</td>
<td>8.1</td>
<td>4.9</td>
<td>6.1</td>
</tr>
<tr>
<td>Post-course</td>
<td>44.8</td>
<td>8.2</td>
<td>9.2</td>
<td>5.7</td>
<td>8.3</td>
</tr>
<tr>
<td>% increase</td>
<td>8.8</td>
<td>25</td>
<td>11</td>
<td>8</td>
<td>22</td>
</tr>
</tbody>
</table>

Combining the two courses, the pre-course mean MCQ result was 35% (SD 4.23), and post-course 43.9% (SD 2.99), two-tailed P value <0.0001 (extremely statistically significant). The mean pre-course mean skills score
was 5.1 (SD 2.1), post-course 7.7 (SD 1.5), two-tailed P value <0.0001 (extremely statistically significant).
Summary

The Ugandan SAFE Paediatric Anaesthesia course was well received with excellent feedback from the course participants. The training materials were appropriate, and we were able to modify and further improve them after discussion with the faculty members and the course participants during these two pilot courses. The Ugandan faculty was actively engaged in teaching and running the course, reflecting experience gained during the previous AAGBI SAFE anaesthesia courses, also the great leadership of this young group of anaesthetists.

The training materials have been finalised as a result of this course, and the next step is to publish them under a creative commons licence.

We have been invited by the Uganda Society of Anaesthesia/Association of Anesthesiologists of Uganda to run another course in Uganda, in the same venue, This course will be aimed at the MMed trainees who have not attended the course to date, followed by a train the trainer course and a then a further course aimed at anaesthetic officers with the MMed taking on the role as trainer. We intend to invite other MMed trainees from training schools in East Africa to this course, for example, from Kenya, Malawi, Ethiopia and Zambia, and will need to seek funding for these courses.

The course and the SAFE booklet are currently being translated into French so that the course can be piloted on Mercy Ships in April for French-speaking anaesthetists in Madagascar.
## Appendix I: Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Joseph Kiwanuka</td>
<td>Lecturer in anaesthesia (MUST) (Uganda course director)</td>
</tr>
<tr>
<td>Dr George Kateregga</td>
<td>Lecturer in anaesthesia (MUST) (Local course coordinator)</td>
</tr>
<tr>
<td>Dr Isabeau Walker</td>
<td>Consultant paediatric anaesthetist (Great Ormond Street Hospital, London, UK) (International lead, AAGBI)</td>
</tr>
<tr>
<td>Dr Maytinee Lilaonitkul</td>
<td>SpR anaesthesia (Derriford Hospital, Plymouth UK) (Local course coordinator)</td>
</tr>
<tr>
<td>Dr Nick Boyd</td>
<td>SpR anaesthesia (Derriford Hospital, Plymouth, UK)</td>
</tr>
<tr>
<td>Dr Grant Rodney</td>
<td>Consultant Anaesthtist (Ninewells Hospital, Dundee, UK)</td>
</tr>
<tr>
<td>Dr Iain Wilson</td>
<td>Consultant Anaesthetist (Royal Devon and Exeter Hospital, Devon, UK)</td>
</tr>
<tr>
<td>Dr Alana Kirkwood</td>
<td>SpR Anaesthesia, Great Ormond Street Hospital, London, UK</td>
</tr>
<tr>
<td>Dr Mary Nabukenya</td>
<td>Specialist anaesthetist (Mulago Hospital)</td>
</tr>
</tbody>
</table>
Dr Janat Tumukunde  Specialist anaesthetist, Mulago Hospital

Dr Andrew Kintu  Lecturer in anaesthesia (Makerere University, Mulago Hospital) (Local course coordinator)

Dr Cornelius Ssendagire  Senior resident in anaesthesia (Mulago Hospital)

Dr Felix Lubega  Resident anaesthesia (Mulago Hospital)

Dr Elizabeth Igaga  Resident in anaesthesia (Mulago Hospital)

Dr Paul Ochieng  Resident in anaesthesia (Mulago Hospital)

Dr Simon Kabuye  Resident anaesthesia (Mulago Hospital)

Dr Denis Kakaire  Resident anaesthesia (Mulago Hospital)

Dr Paul Musinga  Resident anaesthesia (Mulago Hospital)

Ciara Walker  Medical student, University of Manchester Medical School, UK

Appendix II: Participants

<table>
<thead>
<tr>
<th>Gp</th>
<th>Name</th>
<th>Hospital</th>
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<tbody>
<tr>
<td></td>
<td><strong>First course 19th-21st January 2015</strong></td>
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<tr>
<td>1</td>
<td>Muwanguzi Moses</td>
<td>CoRSU Hospital</td>
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<tr>
<td>1</td>
<td>Lawach Lucy</td>
<td>Kibaale HC IV</td>
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<tr>
<td>1</td>
<td>Ali Othman Salum</td>
<td>Mulago NRH</td>
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<td>1</td>
<td>Godfrey Agupio</td>
<td>Mulago NRH</td>
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<tr>
<td>1</td>
<td>Kutuusa Ellen</td>
<td>Kamuli General Hospital</td>
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<td>1</td>
<td>Orono Joel</td>
<td>Gulu</td>
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<tr>
<td>1</td>
<td>Taabu Geoffrey</td>
<td>Kalongo Hospital</td>
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<tr>
<td>1</td>
<td>John Peter Okurut</td>
<td>Mulago NRH</td>
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<td>1</td>
<td>Bukaneya Dorothy</td>
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<td>1</td>
<td>Kabahumuza Regina</td>
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<tr>
<td>2</td>
<td>Nabulya Peruth</td>
<td>Buvuma HC IV</td>
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<td>Karungi Florence</td>
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<tr>
<td>2</td>
<td>Haji Lila Mrisho</td>
<td>Mulago NRH</td>
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<td>Sr. Joyce Piracel</td>
<td>Mulago NRH</td>
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<td>2</td>
<td>Oryang Henry Tiberious</td>
<td>Lacor Hospital</td>
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<tr>
<td>2</td>
<td>Ojara Aldo Okwajiom</td>
<td>Lacor Hospital</td>
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<tr>
<td>2</td>
<td>Ocaya Rose Charles</td>
<td>Lacor Hospital</td>
</tr>
<tr>
<td>2</td>
<td>Odele Emmanuel</td>
<td>Lacor Hospital</td>
</tr>
</tbody>
</table>
Toolit Given Ronald  Lacor Hospital
Tuhirirwe Anisha  Mulago NRH
Nampala Caroline  Mulago NRH
Katureebe Lydia Mary  Kyenjojo Hospital
Rajab Haji  Mulago NRH
Biryeri Rosemary  Kamuli General Hospital
Ojara Simon Shepherd  Lacor Hospital
Oboi Nathan  Amuria HC IV
Napuwa Julius  Villa Maria Hospital, Masaka
Chemutai Allan Mar  Kaproron HC IV
Jacob Kityo  Mulago NRH
Charles Olupot  Mulago NRH
Malinga Ismail  Lacor Hospital
Machano Khamis  Mulago NRH
Asiimwe Dinah  Virika Hospital
Tusime Janet  Kikuube HC IV
Bamwitisa Proscovia  Busesa HC IV
Nuwagaba Diliane  Ibanda Hospital
Nyakaisiki Violet  Kibito HC IV
Wesonga Paul  Tororo Hospital
Okello Alex  Lira RRH
Okuda John Bosco  Lira RRH

Second course 22nd-24th January 2015

Guma A John  Soroti RRH
Beinomugisha Charles  Bwizibwera HC IV
Bakeine Alice  Rukunyu HC IV
Sibenda Nason  Kyarushozi HC IV
Emmanuel Ntivuguruzwa  Kiwoko Hospital
Asiimwe Maria gorret  Ntara HC IV
Nakate Jennifer  Bugiri Hospital
Ssegirinya Yuda T.  Mityana Hospital
Akusekera Yunia  Hoima RRH
Ssenteza K Derrick  Luweero HC IV
Ddamulira Dick  Masaka RRH
Kyarikunda Ruth  Itojo Hospital
Mugisa Emmanuel  Mbale RRH
John Khawanga  Cure Hospital Mbale
Ndibalekera Sarah  Masaka RRH
Nanziri Zura  Lwamwanja HC IV
Tumwesigye Angelo  Itojo Hospital
Byaruhanga Lawrence  Rwekumbo HC IV
Okello Peter  St. Joseph’s Hospital, Kitgum
Oryono Charles Quinox  Bududa Hospital
Sr. Maria Prospera Nabbosa  Kitovu Hospital
Mugenyi Henry  Bukuuku HC IV
Kityu Zenaida  Soroti RRH
Kayongo K Wilson  Kakumiro HC IV
Aguti Maria  CoRSU Hospital
Wampaalu George  Bwenge HC IV
Course Photographs

With thanks to Nick Boyd