"Tell me and I forget. Teach me and I remember. Involve me and I learn."
—Benjamin Franklin, 1706–1790

Improving the standard of operative surgery in sub-Saharan Africa by means of self-sustaining anastomosis workshops

The International Cambridge Anastomosis Workshop

Clive Quick, Bob Lane, Paul Gartell, Russell Lock, and Judy Mewburn – the volunteers

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Trainees in Ethiopia showing their colo-rectal anastomosis

OUR STORY IN SUMMARY

All surgeons love to undertake practical procedures to repair people damaged by disease or trauma, and surgeons everywhere are eager to improve their technical ability. However, learning opportunities are few in Africa where scarcity of resources and personnel give little latitude for such indulgences. Theatre nurses too have to run just to stand still, often because of poor organisation and training.

Any adult in Africa is likely to have several children, and bread-winners have numerous dependent relatives. If either suffers surgical complications or dies, the adverse effect on the family is catastrophic. Anastomotic failure after bowel surgery is a common complication in Africa, leading to bowel contents leaking into the peritoneal cavity with devastating results .

Surgical teams need to operate efficiently, economically and efficaciously to produce the best possible outcomes. Our small team of faculty members was invited to help train them, and has shown we can effectively pass on a high level of expertise to trainer and trainee surgeons and theatre nurses during short, carefully-planned workshops. It is gratifying to see participants enjoy the unfamiliar experience of intensive training and to blossom as they gain proficiency and confidence – all to the ultimate benefit of their patients.

Families in Zimbabwe and Uganda

Trainers, trainees, UK faculty and nurses on the first course in Zimbabwe

1. BACKGROUND

In Africa, would-be surgeons go through minimal training before being posted to rural hospitals. There, they work in low resource settings with little supervision, treating whatever presents – trauma cases, obstructed labour, abdominal emergencies like perforated ulcer or typhoid bowel and childrens' congenital abnormalities. Their practical training is in the form of apprenticeship, learning from senior surgeons during operations; inevitably it is patchy. The same was true 30 years ago in the UK but we now have introduced structured training and simulations.

Patients in Africa are thus at risk of poor outcomes or death because of incomplete training, but if things go wrong, no searching questions are asked and perhaps no lessons learnt.

Surgeons in Africa need to and **want to** learn the underlying principles of operative surgery and how to craft leak-proof anastomoses in bowel, blood vessels and urological organs – the key techniques for any general surgeon.

Matthew Wazara, Consultant Surgeon, and presenting certificates in Zimbabwe

Bob Lane demonstrating pelvic surgery

2. ABOUT OUR VOLUNTARY PLACEMENT

The Association of Surgeons of GB & Ireland (ASGBI) has long collaborated with the College of Surgeons of East Central and Southern Africa (COSECSA) to train trainers in Basic Surgical Skills (BSS), which has become established and locally run throughout the region, and also co-operate on other surgical courses.

COSECSA asked the Overseas Development Committee (ODC) of the ASGBI to provide an advanced anastomosis workshop to follow the BSS course. Bob Lane decided Clive Quick's long-running Cambridge Anastomosis Workshop was suitable so he put together the team named on this poster, set about obtaining a grant from the UK Department for International Development (DFID) for six workshops. He liaised with COSECA and individual units in East Africa to find the six units most eager to host the workshops. All these workshops have all been completed since Sept 2015.

As a small group of surgeons and a nurse, we've attempted to transfer skills, experience and training techniques developed in the UK over the last half century into better quality operative surgical training for Africa in a series of workshops, by teaching safe and meticulous anastomotic techniques that can be propagated by local surgeon trainers. At the same time, we teach a range of skills to theatre nurses, who are often under-recognised and undervalued in Africa.

3. WHAT PROMPTED US TO TAKE PART

We are experienced medical professionals, who believe ourselves fortunate to have gained worthwhile expertise and experience from which others could benefit. We all know and love Africa. All of us have been involved with the Overseas Development Committee of the ASGBI and had previously volunteered in Africa, devising courses that host countries requested.

In the UK, Clive Quick originated and runs the Cambridge Anastomosis Workshop. A consultant surgeon from Zimbabwe who attended the Cambridge course immediately asked that it should come to Harare.

The coming together of this desire for a course and an existing workshop crystallised the development of the **International Cambridge Anastomosis Workshop.**

Manual and DVDs for the Cambridge Anastomosis Workshop

4. EXPECTATIONS AND PREPARATION

Previous courses we have run in Africa convinced us there were doctors and nurses eager to learn and well able to absorb, apply and pass on practicable techniques, so we confidently expected full engagement. The aim was to offer a workshop that could easily be run by local surgeons, initially with our help and later without.

The UK Tropical Health and Education Trust (THET) gave us a grant to run courses in six low income East African countries. The volunteer team consisted of four surgeons and a theatre nurse. The application emphasised **sustainability** of the workshops and **evaluation** to demonstrate the workshops were useful and effective.

Each course would start with one day of 'Training the Trainers', 6-8 keen senior local surgeons, then 3 days of hands-on workshops to train trainees, to be conducted largely by the trainers. Preparation involved pinpointing a keen local lead surgeon, administrator and head nurse in each unit, preparing a flow chart of all materials and instruments used at each stage and arranging sponsorship to provide sutures with Ethicon (Johnson and Johnson). The faculty members with their knowledge of Africa, the services of a good administrator in the UK and the backing of the ASGBI all contributed to our hopes of success.

5. WHAT NEEDS OF THE COMMUNITY DID THE PROJECT ADDRESS?

Everywhere in the COSESA region there is a lack of hands-on lab training in practical surgery. By bringing a fully developed structured course to each country and training 6-8 local trainers, we set the scene for the course to be run by local surgeons. Good knowledge and skills have a habit of spreading far beyond the original course.

6. PRACTICAL ASPECTS OF THE COURSE

Trainers and trainees were recruited locally. We specified what was needed locally, including a classroom with desks, electricity, water, a nearby freezer, a data projector and disposables like gloves, towels and cork boards.

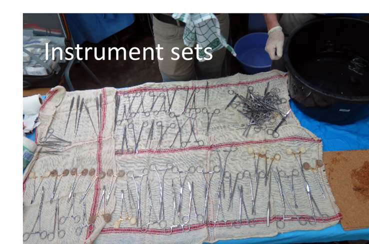
The Cambridge Anastomosis Workshop was filmed in the UK and a set of DVDs and a handbook created.

On each visit, we brought a laptop computer, surgical instrumens, a full set of specimens of frozen pig material to operate upon and a flow chart showing everything needed for each procedure.

Each course concentrated on training trainers who then supervised twelve trainees over an intensive 3-day practical laboratory course on bowel, gastro-oesophageal, urological and vascular anastomoses. Techniques were demonstrated on DVD then performed by trainees under close scrutiny. Each anastomosis was inspected for faulty technique and tested for integrity under water pressure, impossible in patients. Twelve theatre nurses learned the surgical assistant role, theatre organisation, sterility and professional cooperation. Their course is accredited by the East African nurses union, ECSACON.

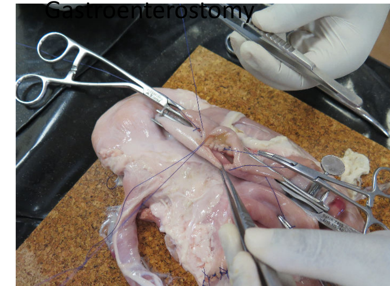
The visiting faculty members

The six countries in which we held workshops


Instrument sets

Training lab in Addis Abbaba, Ethiopia

The full frozen pack of pig material


Gastroenterostomy performed in the lab

Training theatre nurses

7. SUSTAINABILITY AND LONGEVITY OF THE PROJECT

In each of the six countries, we sought feedback from trainers, trainees, theatre nurses and administrators. In Rwanda, we recorded interviews with several participants. All were enthusiastic about the benefits to them. One consultant in Rwanda said: *"You have made a permanent impression on surgery in Africa"*. Trainer consultants reported learning techniques and methods themselves and we have evidence from Zimbabwe that a specific technique, palming the needleholder, has spread throughout Harare.

After each course, we left manuals and DVDs as well as all paperwork needed to run the course; trainers everywhere indicated they intended to repeat the workshop without our participation.

We are seeking interest from broadcasters to make a documentary film or radio programme to propagate interest Logistical problems were ironed out over several courses and the structure simplified to run it on a minimal budget.

8. WHAT WE DID IN A TYPICAL DAY

Each workshop lasts 4 days. The first day is Training the Trainers and the next three the course proper. We will describe one of these days:

Team collected from the hotel at 7am and driven to Surgical Skills Lab to meet local trainers. Each of the visiting faculty has adopted a role: Bob Lane prepares instruments; Russell Lock prepares meat for that day's procedures; Paul Gartell looks after the AV equipment; Clive Quick coordinates everything and ensures the local trainers are ready to do the presentations they have chosen. We all take part with the trainers to set up work benches according to the flow chart. Meanwhile, Judy Mewburn sets up her nurse teaching programme for 12 theatre nurses in another room.

The trainees enter and the first procedure is presented by a trainer from DVD, e.g. end-to-end small bowel anastomosis. This takes 10-15 minutes during which questions and discussions take place. The trainees then undertake the procedure in pairs with close supervision, largely by their own trainers. Completed anastomoses are tested by instilling water and inspected by cutting them open to provide visual feedback on the quality of surgery.

Trainers mark their students with a view to picking up trainees not coping for later discussion. This process is repeated for each procedures during the day with coffee and lunch breaks. At the end of the day, trainers and faculty have a constructive feedback session.

9. BENEFITS TO US OF TAKING PART

Teaching eager students is always a pleasure. Seeing them fully engaged and progressively improving their understanding and technical expertise is satisfying. Add to that the good results from outcome assessment and we are sure we have been involved in a worthwhile co-operative project to enhance the quality of operative surgery.

As the workshop series progressed, we learnt better how to run such workshops and how best to engage and inspire local trainers with visiting faculty gradually fading into the background. We improved our efficiency setting up the workshop with each new country visited.

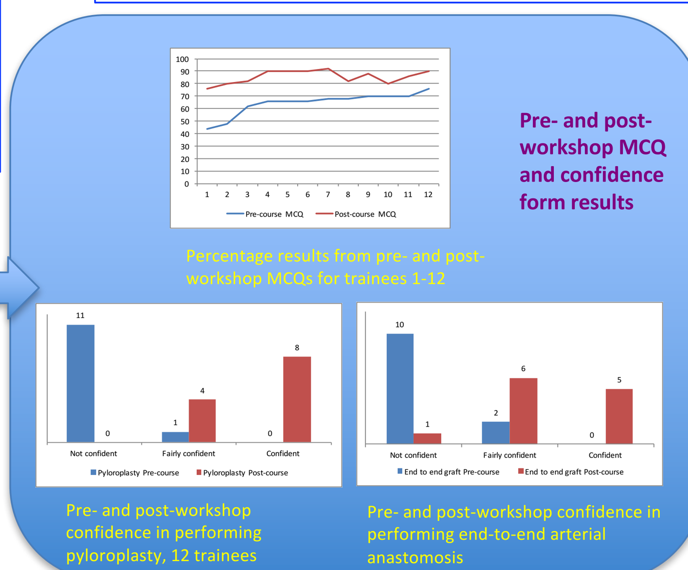
We became optimistic about Africa's future, in the hands of competent people eager for education and we came to appreciate the unique beauty of Africa

10. ENCOURAGING OTHER VOLUNTEERS TO GET INVOLVED

- We are describing our experiences in a poster accepted for this year's ASGBI congress in May, where Clive Quick will also be giving a 20 minute presentation. The congress is attended by large numbers of surgeons of all grades whom we hope will become interested
- We are planning a documentary film or radio programme that will help expand knowledge
- We are also applying for a further grant to run this workshop in West Africa

11. OUTCOME MEASUREMENT

Performance of trainees was evaluated jointly with local consultants. Including direct observation and formative assessment. Trainees showed improved practical competence. MCQ papers before and afterwards revealed improved knowledge; increased confidence was reported for all anastomoses; and feedback was almost universally positive from trainers and trainees. Long term outcomes of the course will be assessed later using reports from trainers and trainees and, where possible, by clinical audit of patient outcomes.


Pre- and post-workshop MCQ and confidence form results

Percentage results from pre- and post-workshop MCQs for trainees 1-12

Pre- and post-workshop confidence in performing pyloroplasty, 12 trainees

Pre- and post-workshop confidence in performing end-to-end arterial anastomosis

Comments from participants:

"The presenters gave their all. Their passion was obvious and motivating"

"Thank you for choosing Zim for the inaugural Workshop"

"This is a small note just to say thank you for what you have introduced to us with respect to surgery. Thanks for choosing to come to our centre to introduce new ways of performing surgery. The techniques you have brought really feel safe and strong. I feel different after the three days of workshop, I truly feel much stronger. On behalf of others especially us residents, we promise to keep alive what u have taught us' Second year resident (PAACS/COSECSA), Arusha Lutheran Medical Centre, Tanzania

Trainees sitting an MCQ

Attentive students in class

12. CONCLUSIONS

- There is a need for expert laboratory surgical training in Africa; courses developed in the UK can provide this
- Sub-Saharan African countries are enjoyable to visit. This was the cradle of mankind and we have become optimistic about the future in Africa
- Running an advanced workshop of this type in developing countries is feasible and effective if there is local commitment. A small group of experienced volunteers with minimal equipment can effectively train local trainers in a short course that is sustainable and is likely to lead to radically better surgical outcomes in the long term
- The volunteer team's expertise grew with each course, gaining logistical and teaching skills and establishing contacts with doctors and nurses for future support and personnel exchanges
- Subjectively, the enjoyment of trainers, trainees and nurses was evident. Many commented they'd never had a workshop like this and they recognised its value to them
- The trainers and trainees are just as skilled, intelligent and engaged as we expect in the UK; African countries are now showing how progress can be made with limited resources
- Such courses are a good and measurable use of aid money
- Involvement of theatre nurses is worthwhile and contributes to their skills and team working
- We are now working on extending these workshops to other African countries and on plans to help local surgeons to run their own courses in countries we have visited

We would like to thank the UK Department for International Development (DFID) and the Tropical Health and Education Trust (THET) for awarding the ASGBI and the College of Surgeons of East, Central and Southern Africa (COSECSA) an HPS Grant to enable this project