Support Services

How to hone haematology skills

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In Ghana a pilot programme for the continuing education of haematology laboratory technicians has produced marked improvements in skills and has led to the development of a five-year strategy for national in-service training. The factors responsible for the success of the programme are outlined below.

In response to a request from laboratory staff in Ashanti Region, Ghana, a pilot programme was devised for upgrading the skills of haematology technicians. Based at the School of Medical Sciences, Kumasi, its components were:

- role modelling;
- training of trainers;
- an intensive practical course.

Laboratory staff often cover a wide range of pathology disciplines, but it was not practicable to attempt comprehensive training in all specialties. The technical staff chose to concentrate on haematology initially in order to arrive at the most effective teaching methods, which, it was reasoned, would subsequently be applicable to the improvement of skills in other areas. The objectives of the programme, drawn up by laboratory personnel, were to:

- improve the quality and safety of the methods employed;
- strengthen background knowledge of these methods;
- develop motivation for continuing self-education;
- ensure long-term sustainability of continuing education in the laboratory service.

Role modelling and problem identification

Two technicians from the United Kingdom, one experienced in routine haematology and the other in blood bank procedures, spent three months working in the haematology laboratory of the Kumasi medical school’s teaching hospital. They demonstrated good working practices and led tutorials with individuals or small groups on problems identified by their Ghanaian colleagues. This resulted in the targeting of the following deficiencies.
Insufficient basic haematological knowledge was causing unsatisfactory interpretation of results and a lack of self-confidence.

Reagents and equipment were inadequate or of poor quality.

There was a lack of management training for senior technologists.

During this phase, experienced haematologists assessed the knowledge of laboratory staff, communication between laboratory and clinical users, and clinicians’ perceptions of problems in the laboratory. A collaborative process led to the definition of objectives and the creation of a curriculum for a three-week practical course. Arrangements were made to equip trainers with the skills needed to maintain continuing education in the long term.

Training trainers

Four highly qualified technologists were identified by senior pathology staff as potential leaders in their profession. They were working in different parts of Ghana and their schedules required them to make frequent visits to outlying hospitals. Consequently, they were well placed to train technicians and receive feedback from them at district level. They spent six weeks in the United Kingdom learning specific technical skills, quality assurance and management, and communication and presentational skills. With the assistance of tutors based in the United Kingdom, these trainers were instrumental in determining the format, content and implementation of the practical course.

Practical course

Haematology staff from the Komfo Anokye Teaching Hospital and eight district hospitals took up the 30 places on the three-week course. The 5:1 ratio of male to female participants, whose ages ranged from 24 to 58 years, reflected the ratio in the Ghanaian laboratory service. Only about a quarter of them had a technical certificate or diploma.

The curriculum covered the most common haematology tests performed at the teaching hospital and also, at the request of the participants, parasitology and blood transfusion. Special attention was given to first principles and hands-on practice so that the participants would be able to deal with problems when working alone in district hospitals. Each topic was illustrated by referring to clinical conditions familiar to the participants, such as hookworm-induced iron deficiency and the consequences of sickle-cell anaemia.

Each session comprised seminars and the demonstration of practical techniques.

Subjects covered by the practical course

- Haemopoiesis
- Cell counts
- Morphology of anaemia
  - haematinic deficiency
  - haemolysis
  - haemoglobinopathies
  - G6PD deficiency
- Measurement of haemoglobin and haematocrit
- Stains for morphology and reticulocytes
- Haematological parasitology
- Sample-handling and quality control
- Basics of blood transfusion
Tasks of varying difficulty were given simultaneously so that each student could work at his or her own level. The equipment used, on loan from local hospitals, was familiar to the students. The trainers led most of the sessions using student booklets, teaching materials and morphology slides provided by United Kingdom tutors.

**Assessment**

Before the course began the participants anonymously completed a test that provided a baseline score and indicated areas where special learning efforts were needed. Anonymity was observed so as to avoid discouragement of any of the participants, and time was allowed for familiarisation with the multiple-choice format, which mainly tested reasoning ability and knowledge of practical methods. At the end of the course another test was set and practical skills were assessed by means of an objective structured laboratory examination. Certificates were awarded by the University of Science and Technology, Kumasi.

An average improvement of 52% was achieved in the multiple-choice tests. Two months after the participants had returned to their posts they were spending an average of seven hours a week on study and were exhibiting marked advances in the quality and reproducibility of Leishman staining, haemoglobin electrophoresis and other methods. The programme resulted in the introduction of G6PD fluorescent spot screening, a sensitive technique. The technicians gained confidence in the interpretation of blood films, while their reports became more informative. Awareness of safety issues was heightened: sharps bins were in use, pipetting by mouth was eliminated, and leaky, rubber-stoppered blood bottles were replaced by screw-cap bottles. Clinicians noted a significant improvement in communication between themselves and laboratory staff; in particular, morphology reports were clearer and more appropriate to the clinical situation. The key features accounting for the programme’s success were that:

- it was initiated by the technicians themselves;
- it was planned and implemented in collaboration with the Ghanaian authorities and was complementary to training already in progress;
- it was sufficiently flexible to allow responses to the changing needs of the technicians;
- the United Kingdom tutors established a good rapport with the technicians by working closely with them in their own environment.

Each participant completed an evaluation form at the end of the course. All said they enjoyed it and wanted it to be repeated annually. They found the practical sessions to be the most useful aspect, particularly those dealing with morphology and parasitology. Blood transfusion, leukaemias and haemoglobinopathies were less well understood. The following were regarded as significant problems by the students:

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lack of textbooks and practical manuals;
- unreliability of transport between workplaces and the course venue;
- wide range of baseline knowledge and abilities.

The participants suggested that future courses be residential, that more stringent entry requirements be established, and that each participant or hospital be provided with a practical manual. It was felt that to some extent the laboratory services would have to rely on the “cascading” of knowledge from those with more training to those with less.

The lessons learnt have led to the creation of a five-year strategy for a national in-service training programme for all grades of staff in collaboration with the Ghanaian Ministry of Health. This programme will incorporate the training of trainers, residential courses, and role-modelling attachments to regional trainers. Personnel from the St George’s Hospital Medical School, London, and from Southampton University Teaching Hospital, will train trainers and support them as they establish the initial courses. The organization of trainees’ attachments will be a responsibility of the Ghanaian authorities. The strategy facilitates the setting up of a sustainable national quality control scheme capable of reaching out from regional to intermediate and peripheral laboratories.

The present project provides a model for other disciplines. There is a great need for similar training programmes in microbiology, clinical chemistry and histopathology. Continuing education programmes are essential for the maintenance of laboratory services of good quality in developing countries. Such programmes can be expected to reflect requirements for skills and to provide motivation for learning if technical staff are involved in instigating and designing them. Trainers can give support for self-directed learning and can become focal points for liaison with officials in the countries concerned and with outside agencies. The involvement of the authorities in planning and implementation helps to ensure the long-term survival of programmes.

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