

LABORATORY SERVICES AT AWASSA REFERRAL HOSPITAL

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BACKGROUND

Awassa University Hospital was visited over different days to assess the Biochemistry Laboratory, Haematology and Bloodbank Laboratories. We worked mostly together but sometimes separately. Together we have over eighty years experience in hospital pathology laboratories. We worked with the help of Ato Demissie, the head laboratory scientist, who although extremely busy, was very helpful and kind.

INTRODUCTION

Microbiology and Histology are progressing well, after being started up recently from empty rooms and 'from scratch'.

Haematology, Blood Bank and Biochemistry have been established for some time and cannot be 'started afresh'. They can, however, have the following modifications to help them run more efficiently.

BLOOD BANK

- 1) The main large blood bank fridge should be used instead of the smaller domestic type. This large fridge should be cleaned, have the drawers lined with paper, and the temperature monitored and recorded at least twice daily. Blood of different types should be put in separate drawers
- 2) When blood is drawn, it should be labeled clearly. The donor number and blood group should be written clearly on the label in marker pen.
- 3) When drawn it should be inspected by a senior qualified laboratory person, to check it is clear and correct.
- 4) It should be logged in the laboratory day book clearly and correctly. All details should be filled in as soon as possible after drawing the blood. Once again, this should be inspected regularly by a senior, competent laboratory person.
- 5) The Laboratory day book is adequate as it is, but blood must be signed out for a patient by a named person with date and time taken. Blood must be taken and 'put up' within 20-30 minutes of leaving the blood bank, or returned to the fridge for safe storage. It must not be allowed to 'warm up'.
- 6) Antiserum should be controlled using A and B cells, as discussed, to make sure they are sufficiently active.
- 7) Most importantly, a sustainable supply of 'in date' blood bags should be obtained as soon as possible. At the moment the blood bags in use should be regarded as dangerous and would be illegal in the United Kingdom.

- 8) Patient compatibility testing is adequate for patients who have never been transfused before. Patients who have been previously transfused should be regarded as possibly having immune or irregular antibodies. These can only be detected using the Coombs test using anti-human globulin at 37⁰C.

HAEMATOLOGY

- 1) The Abbot CELL-DYN 1800 is adequate for doing complete blood counts, including differential count. It must obviously be kept clean and controlled regularly.
- 2) The HUMA-CLOT DUO coagulation machine does not have reagents. If reagents cannot be obtained it should be discarded.
- 3) Basic P.T. and A.P.T.T (the coagulation screen) could be possibly done manually using A 37⁰ C water bath, manual reagents and basic principles.
- 4) The microscopes are not good. They are useable but must be cleaned and maintained daily. They should be used at a comfortable height without having to 'stoop' head and shoulders.
- 5) Giemsa and Wrights stain are used for morphology and malaria staining. I would favor Romanowski staining on thin films only, for both malaria and morphology. This could only be done with training and a supply of the stain.

GENERAL

- 1) In a Hospital of this size with its surgery, obstetrics and other disciplines, the laboratory would normally be headed by a senior chief laboratory technician. Its component departments would be supervised by a senior laboratory technician, each being responsible and accountable to the senior chief. We believe that Ato Demissie needs to be able to delegate departments to competent lab staff and so relieve himself of some of the routine work, but still oversee and control the work and direction of the laboratories.
- 2) Ato Demissie needs an office where he can work and plan in a quiet peaceful environment.
- 3) There are only eight qualified laboratory staff, between all departments. This is not sufficient. There needs to be additional staff. All qualified staff could rotate through departments to increase their knowledge and experience.
- 4) The laboratory store room should be cleared of rubbish and tidied up so that the stock can be used in rotation. A blocked door in this store could be opened and made available for staff only, to enter the laboratory. This would enable them to enter the laboratory without going through the "patient room" which is sometimes very chaotic.
- 5) Student laboratory staff should be encouraged to help in cleaning and tidying the laboratory.
- 6) Every effort should be made to secure blood bags and reagents and the laboratory chief technician, Ato Demissie, should receive more help in developing the Laboratory that the Hospital needs.

BIOCHEMISTRY

- 1) The Human 900 S PLUS analyzer is an adequate analyser provided with sustainable reagents by the A.R.T program. This analyser is working well and must be cleaned and maintained daily to ensure continuous and efficient use. However, it does not have the facility for sodium and potassium analysis.
- 2) There is a Humastar 300 analyser in the laboratory, which is capable of doing the same tests as the Human 900 S PLUS. At the time of our visit it was not up and running. It was suggested that every effort should be made to commission this machine as it was of no use as it is. Once started up, calibrated and controlled, both analysers could be run alternatively to ensure continuity in the event of breakdown. This machine also has the facility to do Sodium, Potassium and Calcium analysis. Following these useful suggestions this analyser was started and worked up, and is now in routine use and they now have a back-up system enabling a continuous service in the event of a failure..
- 3) The RIELLE 5010 photometer should be maintained in a useable condition for back-up and training students.
- 4) There is a good supply of glucose strips for the Glucometer. However, this should be controlled daily and records kept accordingly.
- 5) There is a Roche OMNI C gas analyser in the store room. If this could be brought into the lab, assembled and started up, this could provide Sodium, Potassium and blood gases. This is dependant on all parts being in the store, and new (in date) reagents able to be purchased from the supplier.

LABORATORY SERVICES AT THE RURAL HEALTH CENTRES

We visited four health centres to enable us to assess the work done, and the equipment used and what was needed. The morale of the staff was noted in our many discussions and a good overall view of the laboratories was gathered.

The laboratories were at Wondo genet, Alaba, Shone and Yirgacheffe.

YIRGA CHEFFE

Positive Points

1 technician helped by a nurse (other one on holiday).

Tidy and clean.

2 microscopes, one solar, one electric (quite well maintained).

ESR stand and tubes.

Fridge working satisfactory.

Glucose meters.

Urine/Blood centrifuge in working order.

Haematocrit centrifuge in working order.

Haemometer (for measuring haemoglobin).

Slide dryer.

Urinalysis and examination of stool for parasites using microscope test.

Urine testing strips.

Pregnancy test strips.
HIV rapid testing cards.
1 set of Monica Cheesbrough books.
Good supply of cleaning materials and bleach.
Giemsa stain for malaria.
Methylene blue stain.
Carbol Fuschin stain for TB.
Card tests for syphilis.
CD4 counts collected and sent to Dilla Hospital.
TB positive slides are incinerated.
There is a hand cranked centrifuge available - very useful when there is no power.
Technician uses gloves to take blood samples.

Negative Points

Intermittent electricity supply. It is not available for 3 days a week.
Using solar microscope due to not having continuous electricity.
No strips for glucose meters (until we arrived).
No cards available for Hepatitis B and C.
Problems getting reagents and stains.
Technician very aware of workload and says it is very difficult for one person to cope so morale is low.
Not easy to do blood cell morphology due to stains in use.

Conclusion

They do a very good job considering staffing levels and resources.
Due to the intermittent electricity supply they need a microscope with a UPS. This charges the battery when used on the mains supply, which then powers the microscope when the power is unavailable. This is a very busy laboratory and could do with more staff. A way of numbering /labelling samples is needed to ensure there is no mix up between samples.

ALABA

Positive Points

3 laboratory technicians.
Tidy and clean.
2 centrifuges, one urine, one blood, both working.
Fridge working satisfactory.
Glucose meters.
1 microscope in working order, but not well maintained.
Urinalysis and examination of stool for parasites using microscope test.
Urine testing strips.
ESR stand and tubes.
Methylene blue stain
Carbol Fuschin Stain for TB.
CD4 counts collected and sent to Durame.
Widal test cards for typhoid.
HIV rapid test cards.
Good supply of cleaning materials and bleach
Monica Cheesbrough books available in training room.
Giemsa stain for malaria.
ZN stain for TB.

Negative Points

No glucose strips available on our arrival.
No haematocrit centrifuge or haematocrit tubes.
No haemometer or Haemocue (for measuring haemoglobin).
1 microscope not working.
No pregnancy testing strips on our arrival.
Problem in getting reagents and stain.
Not easy to do blood cell morphology due to stains in use.
Electricity supply sometimes fails.
Large prison in nearby remote area could cause large amounts of work to be necessary.
Large numbers of malaria cases require good microscopes and staining techniques.

Conclusion

Alaba were unable to do pregnancy tests at the time of the visit due to strips being unavailable. Also, although they had glucose meters they had no strips. Obviously there is a problem with resources or availability of these supplies. Lack of haematocrit or haemoglobin assay is a serious shortfall in the laboratory tests and needs to be rectified urgently. Considering the workload (malaria etc.) and the equipment available, the staff did an excellent job.

WONDO GENET

Positive Points

3 laboratory technicians.
Clean and tidy.
1 microscope in good order
New shelter for patients waiting for their test results, to shade them from the sun.
Uses colour comparison test for haemoglobin (Haemometer)
Glucose meters and strips.
Urine testing strips.
Urinalysis and examination of stool for parasites using microscope test.
Centrifuge in working order.
Giemsa stain for malaria.
ZN stain for TB.
Pregnancy test strips.
Widal test for typhoid.
Weil Felix test for rickettsia.
HIV rapid card tests.
CD4 counts collected and sent to Awassa Hospital.

Negative Points

Very poor lighting in the laboratory due to faulty light fitting.
Staff just using a desk lamp for lighting.
Not easy to do blood cell morphology due to stains in use.

Conclusion

Technicians do an excellent job considering equipment and resources available.

SHONE

Positive Points

1 very good laboratory technician.
Clean and tidy.
1 well maintained microscope.
Giemsa stain for malaria.
ZN stain for TB.
Haematocrit.
Urine testing strips.
Urinalysis and examination of stool for parasites using microscope test.
HIV rapid card tests.
Glucose meters and strips.
ESR stand and tubes.
Pregnancy tests strips.
Weil Felix test for rickettsia.
Widal test for typhoid.
Card test for hepatitis B.
Fridge in working order.

Negative Points

Technician not there every day due to having to work in several laboratories.
All old stains films disposed of in pit.
? No incinerator available.
Due to being a very high malaria and typhoid area the technician's time was mainly taken up doing these tests.
Very small laboratory.

Conclusion

Technician did very good job considering very high workload of malaria and typhoid. He was left with very little time to do any other tests. This laboratory needs full time staff to cope with the high workload.

RECOMMENDATIONS

The work carried out by the four laboratories was very similar. Some aspects were identical but some areas were different.

It would be useful if, for instance, the same method for performing a haemoglobin was used in all the labs. Also if all the card tests and strips used could be the same.

If a uniform laboratory kit could be utilised in each of the labs 'under our wing' it would be far easier for us to help them when we visit.

The microscopes which play such a massive part in the routine work are not maintained, cleaned and cared for adequately. Perhaps it is time to buy and supply a new microscope to each of 'our' labs. Monica Cheeseborough recommends one that uses L.E.D. light and runs on mains electricity, battery or sunlight.

The overall standard of work was excellent. The technicians worked hard and wanted to progress. Morale was sometimes low and we felt appreciated wherever we went. They wanted us to help them achieve more and we believe our visits gave them hope for better conditions, both in the lab work and for themselves academically.