

London School of Hygiene & Tropical Medicine



Diagnostic Parasitology Laboratory

CPA accredited
Ref 2204

Laboratory User Handbook 2008

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A. INTRODUCTION

1. The Laboratory and outline of services

The Diagnostic Parasitology Laboratory is a CPA accredited laboratory, based at the London School of Hygiene and Tropical Medicine, which is itself a centre of excellence for scientific research and postgraduate education. The Parasitology Laboratory provides a reference facility offering a wide range of parasitological investigations for enteric parasites, blood parasites, serology, entomology and technical advice on methodology and laboratory procedures.

The services above are offered to all hospitals, NHS and HPA laboratories, General Practitioners and private medical laboratories throughout the UK and abroad. The Parasitology Laboratory also has considerable expertise in the diagnosis of parasites of non-human primates and offers this service to veterinary practitioners.

Advice on the investigation of malaria and other parasitological diseases is always available; technical teaching sessions can also be arranged for small or large groups.

The laboratory processes around 2000 specimens annually, participates in the NEQAS quality assurance schemes for blood and faecal parasitology and has CPA accreditation.

2. Laboratory policy

Our policy is to offer a first class national diagnostic and reference facility for all parasitic infections. We are also strongly committed to active research into parasites and their diagnosis and to the provision of training for pathology staffs, other healthcare professionals and those working in the control of infectious diseases.

3. Using this handbook

This handbook is designed to aid and advise the user on the appropriate use of the facilities to include diagnostic, teaching and advisory services. The sections are indexed to assist in understanding the structure of the laboratory, identification of staff, the diagnostic and advisory services offered and the specimens and investigations carried out by the laboratory.

Parasites and diseases are listed alphabetically and each section gives an outline of the specimens required for investigation and the tests carried out. This is not an exhaustive list and users not finding a specific requirement should contact the laboratory, which in most cases will be able to help and advise.

4. Malaria Reference requests

The HPA Malaria Reference Laboratory is also located in the same department and will deal with all malaria requests. A separate handbook is available and those wishing to obtain a copy, or further information, should phone the laboratory on +44 (0)20 7927 2427 or +44 (0)20 7927 2318 or download from the MRL website at www.malaria-reference.co.uk

Specimens for malaria diagnosis should be sent to the Malaria Reference Laboratory where they will be dealt with appropriately.

B. LABORATORY AND STAFF

1. Laboratory opening times

The diagnostic laboratory is open between the hours of: -

Monday to Friday 9 am to 5 pm

when staff are available for advice, information, specimen reception and processing.

Most routine specimens are sent to us by post or the DX system, any urgent specimens are usually delivered by courier and accepted during the hours stated. **Please telephone urgent requests prior to despatch to inform us of their impending arrival and priority status.**

2. Out of hours and public holidays

We offer foremost a reference facility and therefore do not provide an on-call service. The majority of specimens we receive will have had preliminary diagnosis made by the sender or primary laboratory and so are usually non-urgent. The laboratory is usually closed on public holidays; when there is an extended holiday period, for example Christmas and New Year, limited cover is arranged to deal with non-urgent postal specimens, and all users are informed of these arrangements prior to the holidays.

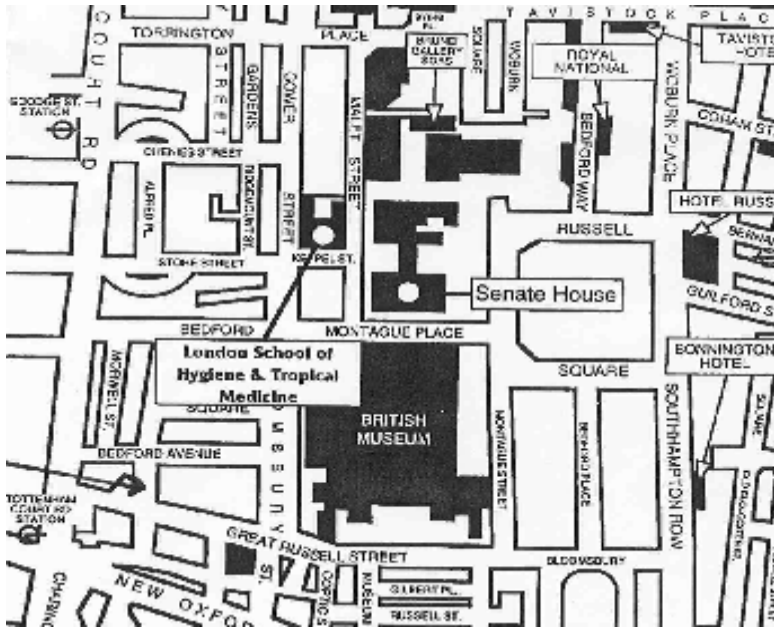
Where urgent diagnosis of malaria out of normal hours is required, specimens should be referred to: -

The Department of Clinical Parasitology at the Hospital for Tropical Diseases (HTD), telephone number: 0845 155 5000 and ask for the duty Tropical Medicine Doctor, who will liaise with the on-call Biomedical Scientist.

Depending on the origin of the specimen, a charge may be incurred for this service.

3. Location

The LSHTM is situated close to Tottenham Court Road, Goodge Street and Russell Square underground stations and is 10 minutes walk from Euston Main line station. Car parking is very restricted in the local area and expensive. The LSHTM has no parking facilities of its own



4. Visitors

Visitors should report to the reception desk in the LSHTM entrance foyer; reception staff will then inform the laboratory of their arrival. It is advisable to make appointments in advance. Members of the general public are not normally seen.

5. Staff and telephone numbers

Title or service	Name	Telephone number
<u>Director</u>	Professor P L Chiodini	020 7927 2427
<u>Clinical Scientist C</u>	John Williams	020 7927 2318
<u>BMS grade 4</u>		
Head BMS/ Training Officer	Claire Rogers	020 7927 2318
<u>BMSs grade 3</u>		
Quality Manager	Dawn Britten	020 7927 2427
Laboratory Supervisor	Juliana Tucker	020 7927 2427
<u>BMS grade 1</u>	Sarah Cheesman	020 7927 2427
<u>MLA</u>	Susan Passarelli	020 7927 2427
<u>MLA</u>	Emma Victory	020 927 2427
<u>MLA</u>	Karen Osborne	020 7927 2427
<u>Results enquiries, (kits, containers and isolation media, forms, guidelines etc.)</u>	Laboratory	020 7927 2427
<u>Laboratory fax number</u>		020 7637 0248
<u>Medical Entomologist</u>	Cheryl Whitehorn	020 7927 2646
(Member of ITD entomology staff, who provides diagnostic expertise to diagnostic laboratory)		

C. DIAGNOSTIC AND ADVISORY SERVICES

1. Information and enquiries

For consultation on the investigation and diagnosis of parasitological disease, interpretation of results and general information, please contact the laboratory on +44 (0)20 7927 2427 from where enquiries can be answered or referred to appropriate personnel.

2. Specimen containers

For the majority of investigations, the submitting laboratory or institution will refer specimens in an appropriate container of their choice.

For certain investigations or where special conditions are required, kits, containers and transport media are available from the reference laboratory upon request.

For example: -

- A collection kit containing 1 plain vial and 3 fixative vials (SAF) with collection instructions is available for investigation of both intestinal cysts and trophozoites including *Dientamoeba fragilis*
- Culture media for intestinal amoebae
- Culture and isolation media for acanthamoebae

See also pages 14 to 35 for guidelines as to appropriate specimen type for specific investigations

Please telephone us if in any doubt as to which container to use or to discuss specific requirements.

3. Request forms

A request form must accompany all specimens referred to the laboratory- see next page for details.

Malaria blood film diagnosis

The Malaria Reference Laboratory supplies forms (blue when hard copy) specifically designed to provide us with all relevant information. Where possible these forms should accompany all malaria blood film requests and should be completed as fully as possible. They may be downloaded electronically from the MRL website at: www.malaria-reference.co.uk. The MRL user handbook is also available to download from this site.

Diagnostic parasitology

We ask that requesting practitioners use our forms to accompany specimens, wherever possible; copies can be sent to laboratories on request.

They may also be downloaded electronically, as a pdf, from the laboratory website at: www.parasite-referencelab.co.uk

4. Minimum Data Set

As a guide, the following table sets our minimum data requirements to ensure patient safety. Where specimens/request forms are received that do not meet this criteria, we shall contact the sender for more information but reserve the right to reject the sample.

	ESSENTIAL	DESIRABLE
SAMPLE	<ol style="list-style-type: none">1. Full name OR other coded patient identifier2. DOB &/or Hosp no./ Unit no./ NHS No.	<ol style="list-style-type: none">1. Sending laboratory's ref no.2. Date specimen taken
REQUEST FORM	<ol style="list-style-type: none">1. Full name OR other coded patient identifier2. DOB &/or Hosp no./ Unit no./ NHS No.3. Investigation required†4. Name and address of requesting practitioner†	<ol style="list-style-type: none">1. Sending laboratory's ref no.2. Date specimen taken3. Telephone/bleep no. of requesting practitioner4. Gender5. Sending lab's diagnosis6. Clinical information* -see next page

† unless evident by nature of form used

**CLINICAL INFORMATION: -*

all relevant clinical details to include (where available)

- antimicrobial therapy
- travel history
- risk status if applicable
- date of onset and duration of illness
- anatomical sites from which biopsies, foreign bodies, insects, other specimens taken
- epidemiological information, for example family/institutional outbreaks

THE ORIGIN OF THE REQUEST MUST BE AN AUTHORISED BODY AND NOT AN INDIVIDUAL MEMBER OF THE PUBLIC

5. Packaging

Packaging must comply fully with UK postal regulations for clinical specimens (UN 602/3373 regulations)

Specimens should be in an appropriate container, securely fastened and in a clear, sealed plastic specimen bag. The accompanying request form should be placed separately in the other pocket of the bag.

The outside of the package must be appropriately marked and clearly state:-

‘PATHOLOGICAL SPECIMEN; FRAGILE – WITH CARE’

In those circumstances where specimens are unlabelled or inadequately labelled and the patient’s identification is unclear, or if they have leaked or are contaminated, they may be unsuitable for testing. In such instances the requesting laboratory or doctor will always be informed immediately by telephone to discuss the matter and to arrange for repeat specimens if necessary.

As a reference laboratory we do appreciate that some specimens cannot be repeated and every effort is made to avoid the need for repeat requests.

6. High risk specimens and safety

Specimens are regarded as HIGH RISK if taken from patients known, suspected, or at risk of having serious infectious disease.

Of note are blood-borne agents such as hepatitis, HIV, or various viral haemorrhagic fevers or other infectious diseases such as tuberculosis or typhoid.

In addition to the standard packaging instructions above, all high risk specimens must be labelled as HIGH RISK both on the container and the request form, with a standard yellow 'DANGER OF INFECTION' sticker, and placed in a Biohazard bag.

Material from a patient with a known or suspected category 4 infection must be fixed according to appropriate guidelines (available on request) prior to despatch.

7. Specimen transport & reception

Most specimens are received via post or courier.

During normal working hours, all specimens should be taken to the LSHTM reception from where they are forwarded to the reference laboratory.

Outside normal working hours, non-urgent specimens may be left at reception, urgent samples should not be left, and those that are may be forwarded to HTD as detailed below.

8. Urgent investigations

Urgent specimens are usually delivered by courier and accepted during normal working hours. **Please telephone urgent requests prior to despatch to inform us of their impending arrival and priority status.** Please package as described, and additionally mark clearly on the outside as 'URGENT'

Where urgent diagnosis of malaria *out of normal hours* is required, specimens should be referred to the Department of Clinical Parasitology at the Hospital for Tropical Disease (HTD), telephone number: 0845 155 5000 and ask for the duty Tropical Medicine Doctor, who will liaise with the on-call Biomedical Scientist.

Depending on the origin of the specimen, a charge may be incurred.

D. SPECIMENS AND INVESTIGATIONS

1. Specimen collection

General

As a reference laboratory, many specimens received have already had preliminary investigations carried out by a primary laboratory and are sent to us in due course.

In general, specimens should be collected or transferred into an appropriate container such as a sterile universal, with an accompanying request form giving all relevant information, including laboratory findings and sent to us with minimal delay.

Please provide a specimen representative of the condition under investigation and in sufficient quantity to permit a full examination – see specific guidelines on pages 14 to 35.

Where a specimen is submitted for a general screen with no specific parasitological investigation requested, we may as a result of our findings or as indicated to us by the specimen type or clinical details given, proceed to further investigations as deemed appropriate.

Faeces

Unless otherwise requested, faecal specimens are given a general parasitological screen to include:-

- examination for adult worms and segments
- formol-ether concentration and microscopy for ova, cysts and larvae
- amoebic culture

If the presence of trophozoites is to be investigated, faeces must either be fresh or collected into SAF preservative.

See also guidelines for intestinal parasites and specific parasitic diseases.

Important

Where possible laboratories should screen faecal specimens for ACDP hazard group 3 organisms before sending on (e.g. some *Salmonella* sp., *Shigella* sp., *Escherichia coli* O157). Where this has not been done it should be clearly stated on the request form.

Blood

See specific parasitic diseases for guidelines on volume, anticoagulants, blood smears etc.

Serology

In general, a minimum of 1ml of serum is required for serological investigations.

Tissues and biopsies

Under aseptic conditions, transfer material to a sterile universal container. If the sample is very small, add 0.5ml of Ringer's or sterile saline to prevent drying.

Worms and worm segments

Adult worms and tapeworm segments should be sent without preservative in a sterile universal container. If there is likely to be a delay of more than 24 hours, then 10% formol water should be added to the specimen.

Ectoparasites and Entomology

Arthropods, larvae, etc. should be sent without preservative if 'living' or otherwise in 70% alcohol in a suitable container. Where extracted from a body site and a risk of infection, specimen may be fixed in 10% formalin, rinsed in water and transferred to 70% alcohol. Do not leave in formalin as this hardens some specimens. Please allow specimen to remain intact if possible, giving full clinical details including travel history and site of extraction if relevant.

NB The above guidelines and the following specific parasitic diseases are not intended as an exhaustive list of parasitological investigations available; please contact the laboratory to discuss individual cases, specific requirements or investigations not listed.

2. Parasitic diseases and their laboratory investigation

Parasites requiring special methods and/or sampling techniques are listed separately; others are listed under general headings. All are listed in alphabetical order.

Amoebiasis

Intestinal amoebiasis/ amoebic dysentery and invasive amoebiasis

Organisms investigated: *Entamoeba histolytica* (pathogenic) or *Entamoeba dispar* (non-pathogenic)

Diagnosis: formol-ether concentration and microscopical examination of faeces for cysts

direct microscopy of fresh faeces /pus for trophozoites

amoebic culture from faeces or pus

Specific antigen ELISA for the differentiation of *E. histolytica* from *E. dispar* from faeces and culture

Specimens: faeces in plain container for concentration and culture

fresh faeces or rectal scrapings for trophozoite investigation to be carried out within 1 hour of sample being taken – please inform laboratory in advance

pus from liver or lung abscess for microscopy and culture*

* Please telephone laboratory for advice before taking sample.

Free living amoebae

Granulomatous Amoebic Encephalitis (GAE)

Primary Amoebic Meningoencephalitis (PAM)

Causative organisms; *Acanthamoeba spp.*, *Balamuthia spp.* (GAE),
Naegleria fowleri (PAM)

Diagnosis: microscopy and culture
 serology for antibodies (IFAT)

Specimens: CSF for culture and antibodies
 serum (1ml) for antibodies

NB These infections require urgent diagnosis; telephone advice should
 be obtained as soon as infection is suspected.

Amoebic keratitis

Causative organism *Acanthamoeba spp.*

Diagnosis: microscopy and culture

Specimens: contact lens and/or wash fluids
 corneal scrapes
 submitted cultures

NB Culture media and a method sheet are available on request

Babesiosis

Causative organism *Babesia spp.*

Diagnosis: microscopical examination of thin and thick blood films for parasites stained with Giemsa and Field's

Specimens: 2 thin (methanol-fixed) and 2 thick (unfixed) blood films sent in a slide container.
Blood should be taken at peak of parasite density as indicated by fever; however parasites may be found in the absence of fever and the examination of blood films should NOT be delayed. Repeat blood films may be necessary to demonstrate infection.

Blood should be taken into EDTA and films made with a minimum of delay.

NB Travel history and splenic status is important in the diagnosis of this infection.

Cryptosporidiosis

Causative organism *Cryptosporidium spp.*

Diagnosis: Microscopy after acid fast staining of faecal smears using a modified Ziehl-Neelsen stain or fluorescent microscopy after phenol auramine staining. Both for detection of oocysts.

immunochromatographic rapid antigen test

Specimen: faeces in a plain container or fixed in SAF (or less suitable, formalin)

Cyclosporiasis

Causative organism *Cyclospora cayetanensis*

Diagnosis: microscopical examination of faecal smears stained by modified Ziehl-Neelsen for oocysts and direct microscopy following formol-ether concentration

Specimens: faeces in plain container

NB up to 3 specimens may be required to exclude *Cyclospora cayetanensis* due to the intermittent nature of oocyst excretion.

Enterobiasis

Threadworm or Pinworm

Causative organism *Enterobius vermicularis*

Diagnosis: microscopical examination for ova

Specimens: adhesive tape smears of perianal skin

 perianal swab

 faeces in clean container (low sensitivity)

Adhesive tape or swab preferred.

Cut a 10cm strip of sellotape, or similar, and press middle 3-5cm firmly against the right and left perianal folds, sticky side down. Stick tape onto a microscope slide and place in a slide box.

or

Moisten a swab in sterile saline and repeatedly roll over the whole of the perianal area; break off into a small volume of saline in a sterile universal.

Carry out either procedure first thing in the morning before bathing or defaecation. Repeated samples over 4 to 6 consecutive days may be necessary to exclude diagnosis.

BEWARE eggs are highly infectious and resistant to drying!

Giardiasis

Causative organism *Giardia intestinalis* (syn., *G. lamblia*, *G. duodenalis*)

Diagnosis: microscopy of fresh faeces for trophozoites and cysts

 formol-ether concentration and microscopical examination
 for cysts

 immunochromatographic rapid antigen test

Specimens: faeces in plain container

 if fresh and for trophozoites, examination should be
 carried out within 4 hours of specimen being produced.

NB Due to the intermittent nature of cyst shedding it may be necessary
 to examine 3 or more samples collected on different days to
 exclude a diagnosis.

Hydatid infection

Causative organisms, *Echinococcus granulosus* and *E. vogeli* for cystic hydatid and *E. multilocularis* for alveolar hydatid.

Diagnosis: microscopical examination for hooks and protoscolices in hydatid sand

Specimens: fluid/contents of cysts

NB advice from a centre expert in the management of hydatid disease should be sought before considering aspiration of a cyst as leakage of fluid may cause further dissemination or an anaphylactic reaction.

Insects and other arthropods

Living *insects, ticks and mites* for identification should be sent in a plain tube without fixation.

If specimen is not living then it should be sent in 70% ethanol.

Larvae (maggots) etc. should be sent live if possible, or in 70% ethanol.

Where specimen has been excised from the patient and there is a risk of infection, the specimen should be fixed in 10% buffered formalin (as used for histology) or 10% formol water/saline, then rinsed in distilled water and transferred to 70% ethanol.

Allow specimen to remain intact if possible, giving full clinical details including travel history and site of extraction if relevant.

Intestinal parasitic infections with helminths and protozoa (general)

A wide range of nematodes, cestodes, trematodes and protozoa are dealt with; some are listed individually e.g. amoebiasis, cryptosporidiosis, cyclosporiasis, giardiasis, microsporidiosis, schistosomiasis.

Diagnosis: macroscopical examination of faeces for adult worms and segments

 direct microscopy of fresh faeces for trophozoites

 formol-ether concentration of faeces and microscopy for ova, cysts and larvae

 iron-haematoxylin staining and microscopy of SAF-fixed faeces for protozoal trophozoites

Specimens: faeces in plain container for adult worms, segments and concentration

 SAF fixed faeces for trophozoites (especially suitable when a fresh sample is not practical and for fragile organisms e.g. *Dientamoeba fragilis*)

 fresh faeces for trophozoites

NB It may be necessary to submit 3 samples collected on different days to exclude a diagnosis.

Leishmaniasis

Visceral and Cutaneous leishmaniasis

Causative organism *Leishmania* spp. (several species involved in both forms of the disease)

Diagnosis: microscopy of stained marrow/spleen/liver impression smears.

 histological examination of tissue sections for presence of parasites

This laboratory only performs microscopy of impression smears or tissue sections.

For a full investigation of cutaneous or visceral leishmaniasis please contact the Department of Clinical Parasitology at the Hospital for Tropical Diseases, telephone number 0845 155 5000 ext. 5418, who offer range of investigations including culture, serology (visceral) and PCR.

Malaria

Of human importance are *Plasmodium falciparum* (malignant tertian), *P. vivax* (benign tertian), *P. ovale* (benign tertian) and *P. malariae* (quartan)

Diagnosis: microscopical examination of thin and thick blood films for malaria parasites and for species determination using Giemsa and Field's stain

parasitaemia estimation to indicate severity of infection and effectiveness of treatment

immuno-chromatographic techniques for the detection of malaria antigen in blood

PCR for malaria confirmation and species determination when required

serology is no longer performed by this laboratory, but may be obtained from the Department of Clinical Parasitology at the Hospital for Tropical Diseases, telephone number 0845 155 5000 ext. 5413

Specimens: 2 thick (unfixed) and 2 thin (methanol fixed) ready made films sent in a slide box and a sample of EDTA blood which was used to make initial diagnosis (minimum 100 microlitres) for PCR

Blood is ideally collected during fever, however parasites are found at all stages of the infection and therefore blood films **without delay** are mandatory in all cases of suspected malaria. If the first films are negative, blood should be taken and films made and checked at least two times over the first 24 hours and further films examined every 12 hours after that if strongly clinically indicated. Blood taken into anticoagulant (EDTA should be used) should have films made as soon as possible to minimise morphological changes in the parasites, and certainly within 2 hours. However, parasites can be detected even after extended exposure to anticoagulant (exceptionally up to 24 hours) and no sample will be rejected unexamined.

1 –2 ml of whole blood (EDTA) for antigen detection methods

NB serology has no place in the diagnosis of acute malaria.

**BLOOD FILMS ARE ESSENTIAL IN CASES OF ACUTE FEVER
OR OTHER SYMPTOMS WHERE MALARIA IS SUSPECTED**

Microsporidiosis

Causative organisms including *Enterocytozoon bieneusi*, *Encephalitozoon intestinalis*

Diagnosis: microscopical examination of strong trichrome stained
faecal/urine smears for microsporidial spores

Histology of bowel biopsy tissues from other sites of the
body

Electron microscopy (EM) of biopsies

Specimens: faeces

urine

biopsy material fixed in buffered formol-saline for
histology

Special fixation required for EM, please contact laboratory
in advance

Schistosomiasis

Bilharzia

Parasite: *Schistosoma mansoni*, *S. haematobium*, *S. japonicum*,
S. intercalatum, and *S. mekongi*

Diagnosis: formol-ether concentration and microscopy of faeces for
ova

microscopical examination of urine after concentration or
filtration

microscopical examination of squash preparations of
tissue for ova

histology

Specimens: faeces in plain container

urine in a plain, sterile container.

either a midday urine specimen (between 10.00 and 14
00hrs) or a 24-hour collection of terminal urine

NB peak egg excretion occurs between noon and 3pm,
eggs may be found trapped in the blood and mucus in the
terminal portion of the urine specimen.

tissue- unfixed biopsy material (rectal, sigmoid, bladder)
material for squashes and histology.

NB when screening after return from an endemic area, it is advisable to
examine both urine and faeces.

Trichinosis

Causative organism *Trichinella spiralis*

Diagnosis: microscopical examination for larvae by squash or/and histology

Specimens: unfixed/fixed muscle biopsy

NB it is widely considered unnecessary to perform biopsy for the diagnosis of this parasite, the alternative being serology (performed at HTD)

Trypanosomiasis - African

Sleeping sickness

Causative organisms *Trypanosoma brucei rhodesiense*, *T.b. gambiense*

Diagnosis: microscopical examination of blood films for
 trypomastigotes

 microscopical examination of cerebrospinal fluid where
 neurological involvement *

 serology is no longer performed by this laboratory, but
 may be obtained from the Department of Clinical
 Parasitology at the Hospital for Tropical Diseases,
 telephone number 0845 155 5000 ext. 5413

Specimens: thin and thick blood films for microscopy

 CSF

 Heparinised blood for concentration techniques

 1ml serum for IFAT

* Advice should be sought before attempting to take CSF sample for
diagnosis, due to risk of introducing trypanosomes into the CNS from the
blood

Trypanosomiasis – South American

Chagas' Disease

Causative organism *Trypanosoma cruzi*

Diagnosis: blood film in the acute stage (extremely rarely seen in the UK)

serology by IFAT or ELISA for antibodies in the chronic phase (occasionally seen in the UK)

xenodiagnosis (using laboratory reared vector)

Specimens: 1ml serum for IFAT or ELISA

NB it is not usual to look for trypanosomes in blood or other fluids, however it is possible to perform xenodiagnosis with prior arrangement, please contact the reference laboratory for details. Serology is the usual method for diagnosis

3. Laboratory Schedule

Generally, specimen processing is begun on the day of receipt. Specimens that require microscopy only will often have results available that same day whereas investigations normally processed in batches or requiring culture will take variable periods of time. When complete, final reports are typed and posted the same or next working day - interim reports are available upon request.

Results of any urgent investigations will be telephoned to the requesting laboratory immediately.

As a guideline:-

Malaria:-

Diagnosis by blood film and/or immunochromatographic techniques: processed in the Malaria Reference Laboratory fully on day of receipt - results reported within 1-2 working days.

PCR may take from 2-10 working days to obtain a result.

Acanthamoeba antibodies:-

Specimens are usually considered of an urgent nature and tested on day of receipt.

Intestinal Parasitology:-

Specimen processing takes between 1 and 6 days, depending upon the range of investigations required for each specimen (for example, concentration, specific staining, microscopy, ELISA/PCR, amoebic culture).

When complete, final results are reported same or next working day- interim reports available upon request or when considered necessary by the parasitology laboratory.

Acanthamoeba culture:-

Culture generally takes 5 – 7 working days, microscopy results, where applicable, available in the interim.

Entomology-

This is variable depending upon specimen but normally 2 - 5 working days.

4. Charges

At present most testing carried out by the laboratory for National Health Laboratories within the United Kingdom is without charge; exceptions are shown below.

There is a charge made for work received from private laboratories and certain other institutions and these can be obtained on application.

Tests which always incur a charge:

Acanthamoeba isolation and identification

Acanthamoeba serology

Entomological identification

Specific antigen test for differentiation of *Entamoeba histolytica* and *E. dispar*

For current scale of charges please contact the laboratory for information.

Should there be any change to this, all laboratories will be given wherever possible a minimum of 3 months advance notice.

E. RESULTS AND REPORTS

1. Written reports

Reports are printed and despatched each working day.

In most cases it can be assumed that the written report is final, however if further results are to follow, or if a repeat specimen is required, this will be clearly stated. Interim reports, where necessary, will normally be given by telephone and confirmed in a full and final written report.

Interpretation of results and comments on individual cases will be given where required.

Please contact the laboratory on +44 (0)20 7927 2427 to obtain results or to arrange for copies of reports.

2. Telephone reports

Results of urgent investigations, those which may aid immediate patient management, or any results specifically requested by the sending laboratory will be telephoned as soon as they become available.

The member of staff who has undertaken the investigation will usually give the telephone report; the name and status of the person to whom results are given will be required for our records. The Clinical Scientist or Laboratory Director will telephone to discuss results where interpretation or advice is required.

The results of some investigations may be rapidly available and to aid the management of certain infections will be telephoned immediately. Examples are:

- Primary diagnosis of malaria by microscopy and/or immunochromatographic techniques and PCR
- *P. falciparum* where undiagnosed by the requesting laboratory
- Diagnosis of *E. histolytica* by microscopy and antigen-specific ELISA or PCR
- Any other pathogen where prompt initiation of treatment is considered necessary.

All telephoned reports, whether initiated by the reference laboratory or the requesting laboratory, will be confirmed with a written report.

Please contact the laboratory on +44 (0)20 7927 2427 to obtain results.

3. Fax results

Should the submitting laboratory require, the reference laboratory can fax interim and final results to a secure fax line.

4. Archiving of reports

All reference laboratory copies of written reports (to which the original request form is attached) are held in secure, locked storage for a minimum period of 5 years.

5. Obtaining information and results

Staff are always available during laboratory opening hours to discuss results and to give advice and information.

Please contact the laboratory on +44 (0)20 7927 2427 from where queries can be answered or referred to the Principal Clinical Scientist or Laboratory Director as appropriate.