SCOTTISH PARASITE DIAGNOSTIC & REFERENCE LABORATORY

Title	**User Manual**
LABORATORY PROCEDURE	
NUMBER / VERSION	SPDRL_UM_2016
DATE OF ISSUE	09/09/2016
REVIEW INTERVAL	2 Years
AUTHORISED BY	Dr. C. Alexander
AUTHOR	M. Coyne
COPY 1 of 1	Master file in Q-Pulse
LOCATION OF COPY	GG&C website www.nhsggc.org.uk/smrl

DOCUMENT REVIEW HISTORY
All review / revision details are available in Q-Pulse

Date	Amendment	Initials

Scottish Parasite Diagnostic & Reference Laboratory

User Manual 2016

We aim to select our test repertoire for the benefit of our users and their patients. If you have any suggestions for improving our service please contact us.

CONFIDENTIALITY POLICY

NHSGG&C Standing Financial Instructions and Fraud Policy ensure that users' confidential information is protected and that this department cannot undertake activity that would diminish confidence in its impartiality.

Users' confidential information is also governed by our procedure RL_MP_010 'Management of data & information' and by NHSGG&C I.T. Policy.

Activity that would diminish confidence in impartiality or integrity is also prohibited by the Health & Care Professions Council code of conduct.

Complaints procedure:-

We will:-

1. Take all complaints seriously
2. Deal with the client in a courteous manner
3. Try to resolve the issue immediately at a local level
4. Inform the client about the progress of the complaint
5. Make corrective action as soon as possible
6. Investigate root cause analysis to prevent recurrence

If you have a complaint, contact the Consultant Clinical Scientist (see page 5)

Section One: The Scottish Parasite Diagnostic & Reference Laboratory

Introduction 4
Laboratory hours 5
Contact details 5

Section Two: Services provided by the SPDRL

Submission of samples 6

Specimen acceptance & rejection criteria 7
Transportation of specimens 8

Section Three: Test repertoire and type of specimen required

Amoebiasis 9
Acanthamoeba keratitis 9
Anisakiasis 9
Cryptosporidiosis 9
Cysticercosis 10
Echinococcosis (Hydatid) 10
Enterobiasis 10
Fascioliasis 10
Filariasis 10
Giardiasis 11
Intestinal Helminthiasis 11
Leishmaniasis 11
Malaria 11
Intestinal Protozoa 12
Strongyloidiasis 12
Schistosomiasis 12
Toxocariasis 13
Toxoplasmosis 13
Trichinellosis 13
Trypanosomiasis 13
Analysis of specimens following prior arrangement only 14
Frequency of testing 14

Request turnaround times 14

Reporting of results & Advisory service 14

Section Four: Interpretation of SPDRL Results

Teaching & Research 16

SECTION ONE: HISTORY & INTRODUCTION

The Scottish Parasite Diagnostic & Reference Laboratory (SPDRL)

The Scottish Parasite Diagnostic and Reference Section (previously the Scottish Parasite Diagnostic and Reference Laboratory) (SPDRL) was established in 1982 under the auspices of the Scottish Office, Home and Health Department and financed through renewable block funding awarded under the "New Developments in Health Care" scheme. In concept, the role of the SPDRL was to provide an efficient and effective diagnostic and advisory service for Scotland.

Since 1993, SPDRL has been funded through monies administered by the National Services Division of the Scottish Executive Health Department. The renewable contract is to provide a quality auditable service to users in the NHS throughout Scotland.

Over many years, the SPDRL has developed strong teaching and research links with Universities in the UK and Government establishments. It has a record of excellence in diagnosis, advice and research.

The primary activities of the SPDRL are located within the New Lister Building at Glasgow Royal Infirmary, which provides a range of high quality, cost effective health care services for a local catchment population of approximately 500,000 residents in the North of Glasgow and surrounding districts.

The SPDRL provides specialist services for General Practitioners and Hospital Clinicians throughout the Scottish NHS.

Remit of the SPDRL

1) To provide a comprehensive diagnostic, identification and advisory service for human parasites and the diseases they cause

2) To assist with the management of *Cryptosporidium* outbreaks by providing a service for speciation and sub-typing of isolates

3) To assist Health Protection Scotland (HPS) with the enhanced surveillance of malaria

4) To provide a quality assurance, teaching and training service for all submitting laboratories in Scotland

5) To develop, evaluate and advise on new parasite diagnostic techniques

6) To produce data for HPS and the Scottish Executive Health Department on the incidence of parasite diseases in Scotland

7) To liaise with other diagnostic and research parasitology laboratories in the UK and abroad

LABORATORY HOURS:

Monday to Friday:	08:45 to 17.00
Saturday morning:	Specimen reception only
Public holidays:	Specimen reception only
Emergency situations:	As required after discussion with Consultant Clinical Scientist or Medical Director
Availability of advice:	08:45 to 17.00 Monday to Friday

Out of hours

There is no out-of-hours or emergency on-call service at the SPDRL. For **emergencies only**, please contact the duty microbiologist via switchboard on 0141 211 4000

CONTACT DETAILS

Scottish Parasite Diagnostic & Reference Laboratory (SPDRL)
Level 5, New Lister Building
10-16 Alexandra Parade
Glasgow Royal Infirmary
GLASGOW
G4 0SF

Telephone: 0141 201-8667
Clinical enquiries: 0141 201-8637 / 8667

Consultant Clinical Scientist: Dr. Claire Alexander 0141 201-8637
claire.alexander@ggc.scot.nhs.uk

Medical Consultant : Professor Brian Jones 0141 201 8667

Technical Manager: Michael Coyne 0141 201 8667
michael.coyne@ggc.scot.nhs.uk

Enquires: Please contact the laboratory on 0141 201-8667 for technical queries. All clinical queries should be directed to the Consultant Clinical Scientist on 0141 201 8637 or in her absence, the Medical Consultant, Professor Brian Jones on 0141 201 8667.

SECTION TWO: SERVICES PROVIDED BY SPDRL

Submission of Samples

Specimens sent by General Practitioners in the catchment area are initially sent to either the Glasgow Royal Infirmary or the Southern General Hospital to be dispatched to the SPDRL daily, by dedicated van service. The sending of GP & Hospital specimens from areas out-with Greater Glasgow and Clyde catchment has to be arranged and co-ordinated locally.

All specimens and standard request forms must be clearly marked for the attention of **SPDRL**.

Urgent requests during normal working hours

Please telephone **0141 201 8667** to notify staff that an urgent sample is *en route*. A responsible person (and deputy), capable of accepting and transmitting the result(s), in the submitting organisation must be identified at this time. The results of urgent tests will be telephoned to the identified person (or deputy) in the submitting organisation as soon as they are verified. PLEASE ENSURE A SUITABLE TELEPHONE NUMBER IS PROVIDED TO ALLOW SPDRL STAFF TO COMMUNICATE THE RESULTS IN A TIMELY MANNER.

Request forms

There are two types of request form at SPDRL: (1) general SPDRL request form to be used for all requests, (2) malaria enhanced surveillance form to be completed when sending a microscopy-positive malaria blood sample. Both forms can be accessed at;

http://www.nhsggc.org.uk/about-us/professional-support-sites/microbiology/scottish-microbiology-reference-laboratories/scottish-parasite-diagnostic-reference-laboratory/

Fill out the details on the request forms as completely as possible using a ball point pen. Forms can be photocopied. **Clearly** mark the name of the responsible person (or deputy) to whom results are to be sent.

Please give complete patient identification and relevant clinical details, including risk category. This information is required to determine which special precautions are necessary and which tests are to be done.

By Post

Specimens should be sent to:

Scottish Parasite Diagnostic & Reference Laboratory

Level 5, New Lister Building

10-16 Alexandra Parade

Royal Infirmary

GLASGOW G4 0SF

Telephone: 0141 201 8667 (laboratory)

By DX Courier

DX 6490200, BISHOPBRIGGS 90G

Specimen acceptance & rejection criteria

Sample and request form information must be compatible. The minimum information that should be provided is as follows:

	ESSENTIAL	DESIRABLE
Sample	Patient's Full Name * Date of Birth and CHI number	Date and Time Destination of Report
Request Form	Patients' Full Name* Date of Birth and/or CHI number, *etc* Name of requesting microbiologist. Investigation (s) required * or Proper Coded Identifier	Clinical Information Date and Time of sample Collection Patients Address Referring microbiologist's Contact Number Main symptoms Potential diagnosis Date of onset Travel history

These details are essential for samples processing, interpretation of test results and for enhanced epidemiological surveillance. On the request form please also indicate where reports should be sent.

Improperly Labelled specimens/ Request Forms

Sample or request forms received without the minimum essential identification will be referred back to requesting laboratory.

Samples and forms that are mismatched

The requesting microbiologist (or appropriate laboratory staff) will be informed by telephone that the form & sample did not match.

Samples that arrive with no form

If a sample arrives with no form, a blank request form will be filled out with the details taken from the specimen, booked in and stored for future testing. It should be stated on the request form and on the final report that the sample was received without a request form.

Forms that arrive with no sample

The form will be booked in & a report issued stating that no sample was received.

Samples that are inappropriately labelled

Samples that arrive with no details on them may still be processed, however the report will state "No name on specimen but received in the same bag as request form".

Under the direction of a senior member of staff further action might be:

- Processing the specimen and withholding results
- Storage of the specimen
- Requesting a fresh specimen and request form.

Damaged/ Leaking Samples

The action taken will often depend on how precious the sample is. Some may be difficult to repeat and it may be necessary to save and use what has been received.

Transportation of specimens

All submissions **must** comply with UN3373 postal regulations.

Specimens

Faeces and serum samples constitute the majority of samples received for analysis. Other samples include Sellotape smears, ocular tissue, contact lens / contact lens fluid, jejunal juices, urines, bronchial aspirates and sputa, blood films, skin snips and biopsies. Organisms such as arthropods and worms are also accepted for identification.

If you are uncertain of the type(s) of specimen(s) you should submit for analysis, telephone the laboratory on 0141 201 8667 prior to sending the sample to discuss the appropriateness of the specimen.

Section 3: Test repertoire & type of specimen required

1. Amoebiasis

Intestinal

Microscopy – Optimal results are obtained with stool samples **received at the SPDRL within 72 hours of voiding**. Analysis of older specimens can result in sub-optimal results (false negative). Reports will indicate the presence of *Entamoeba. histolytica / dispar* cysts since the cysts of the pathogen *E.histolytica* are morphologically indistinguishable from the commensal *E. dispar*.

***E. histolytica* antigen detection –** To distinguish between *E. histolytica* and *E. dispar*, an adhesin ELISA is used. If a delay greater than 72 hours is anticipated, samples for the adhesin ELISA should be frozen overnight and sent the following day. Please note that freezing will destroy cysts, so it is advisable to also send a portion that has not been frozen for microscopy.

Microscopy for trophozoites - Examination for trophozoites requires that a hot stool examination. Accordingly the laboratory must be advised in advance of submission. Microscopy of rectal/sigmoid scrapings must be arranged with the laboratory in advance. Amoebic abscesses – (as only trophozoites are present in such samples) must be examined within two hours.

Amoebic serology - serology can distinguish between amoebic carriage and amoebic infection. A LATEX test is provided. For serology **a minimum of 1 ml clotted blood** is required.

2. Acanthamoeba keratitis

Molecular Testing - corneal scrapings are the optimal sample type for this assay. Contact lens/ contact lens solution will also be accepted in the absence of a corneal scrape. If you require this assay, please contact the laboratory on **0141 201 8667** in advance of sampling in order that sample tubes containing specialised transportation broth can be provided. Corneal scrapings should be placed in this broth. There is no requirement to place contact lens or the contact lens solution into broth prior to transportation. For the safety of laboratory staff, please refrain from sending needles or scalpel blades.

3. Anisakiasis

A test for anisakiasis is not available at SPDRL. There are currently no laboratories in the UK that test for Anisakis species.

4. Cryptosporidiosis

Microscopy – see Intestinal Protozoa. This will determine the presence of *Cryptosporidium* oocysts but will not permit speciation / subtyping.

Molecular Testing - SPDRL offers the Scottish *Cryptosoridium* Outbreak Service to assist Health Protection Scotland (HPS) in the management of outbreaks. **Only faeces from cases suspected to be part of an outbreak** should be forwarded to

SPDRL for molecular investigations. If an outbreak is suspected, please notify the Consultant Clinical Scientist at SPDRL in advance of sending a sample(s) on 0141 201 8637 (or 0141 201 8667 laboratory). Approximately 5ml liquid faeces or 5g semi-solid / solid faecal material should be forwarded **WITHOUT** the addition of any additives / fixatives which can inhibit downstream molecular reactions. Speciation and subtyping (if required) will be performed.

5. Cysticercosis

Serology - A serological test (ELISA) is available at the SPDRL to assist with a diagnosis of Cysticercosis, caused by the presence of the larval stage (cysticercus) of *Taenia solium* in various organs. **A minimum of 1 ml of clotted blood is required.**

6. Echinococcosis (Hydatid)

Serology - A serological ELISA is available at the SPDRL to assist with the diagnosis of Hydatid disease, caused by the larval stage of *Echinococcus granulosus*.
A minimum of 1ml of clotted blood is required. Positive results should be confirmed by non-serological means *e.g.* radiology, ultrasound, microscopy and immunodiagnostic tests.

7. Enterobiasis

Microscopy - A Sellotape smear taken in the morning from the perianal skin and attached with the adhesive side facing downwards on a microscope slide is the optimum specimen for detecting *Enterobius vermicularis* ova. Whilst adult worms may be present in stool samples, a negative stool result does not exclude the diagnosis.

8. Fascioliasis

Serology – an ELISA is available to detect precipitating antibodies using an extract of *Fasciola hepatica* antigen. **A minimum of 1 ml of clotted blood is required.**

Microscopy - Fascioliasis is caused by *Fasciola hepatica* (the liver fluke of sheep and cattle). Eggs in faeces are often scanty and may not be found in up to 30% of cases.

9. Filariasis

Serology - The major human filarias are *Wuchereria bancrofti, Onchocerca volvulus*, *Brugia malayi* and *Loa loa*. A filaria ELISA, using *Brugia pahangi* as antigen is used (**requiring a minimum of 1 ml clotted blood**) as a screening test. A negative result does not exclude the diagnosis and this is especially so with onchocerciasis.

Microscopy - With the exception of *Onchocerca volvulus*, a definitive diagnosis of filariasis is usually made by the demonstration of microfilariae in the peripheral blood. Two ml of anticoagulated blood is required. The periodicity of microfilaraemia means that peripheral blood samples must be collected between 1000h – 1400h (day blood) and / or 2200h – 0200h (night blood). *Onchocerca volvulus* is diagnosed by demonstration of microfilariae in skin snips. Skin snips should not be taken without prior arrangement with the laboratory – please contact the laboratory on 0141 201 8667 to discuss.

10. Giardiasis

Microscopy - *Giardia* trophozoites are only detectable when stools are examined within 4 hours of voiding. *Giardia* cysts are frequently either excreted intermittently or autolysed in stools so that a minimum of at least three stools for examination is preferable.

Giardia can be demonstrated in duodenal/jejunal juices if examined within 4 hours. Samples received after that time interval will only be subjected to the *Giardia* stool antigen test.

Giardia **stool antigen test –** The *Giardia* stool antigen test can increase the detection of positives, particularly in *Giardia* cyst-negative stools. *Giardia* antigen from trophozoites and cysts can be present in faeces in the absence of trophozoites or cysts. This test is performed where there is a high index of suspicion of giardiasis despite a negative microscopy result.

Giardia **serology –** an antibody detection assay is NOT available at SPDRL.

11. Intestinal Helminthiasis

(Excluding *Enterobius* infections). Stool samples should be forwarded with the minimum delay. A minimum of three separate samples should be examined before a diagnosis is excluded.

12. Leishmaniasis

Molecular detection – molecular assays for *Leishmania* identification and speciation are available at SPDRL. Please inform the laboratory on 0141 201 8667 in advance if these tests are required. **Suitable sample types include tissue, bone marrow and anticoagulated (EDTA) whole blood (1ml minimum).** Biopsies should be taken from the raised edge of the lesion avoiding the use of iodine which can inhibit downstream PCR reactions.

Serology – a rapid immunodiffusion antibody detection test is available at SPDRL to assist with the diagnosis of visceral leishmaniasis **requiring a minimum of 1 ml clotted blood.**

13. Malaria

Bloods suspected of being malaria positive should be sent in the first instance to the local haematology laboratory for identification. As part of the enhanced surveillance of malaria remit at SPDRL, all samples which are microscopy-positive for *Plasmodium* species should be forwarded to SPDRL **along with a completed enhanced surveillance form.**

Microscopy – The preparation of thick and thin films requires a **minimum 2 ml of anticoagulated (EDTA) whole blood**. Alternatively, stained / unstained thin and thick blood films prepared within haematology laboratories can be submitted to SPDRL for examination.

Serology - The malaria IFAT has been removed from our scope. Molecular assays for *Plasmodium* speciation are available on request.

Malaria antigen detection – Two different antigen detection kits are used to screen all submitted EDTA samples. Both kits detect *P. falciparum* or *Plasmodium* sp. antigens (*i.e*. *P. falciparum* (pf) antigen or an antigen common to all four species of *Plasmodium* infecting humans). These tests will be performed alongside microscopy using the same sample **(anticoagulated EDTA whole blood).**

Malaria Molecular Speciation – Molecular detection of *Plasmodium* species is available to detect common and emerging malaria species that infect humans. This can be performed on request. A **minimum 2 ml of anticoagulated (EDTA) whole blood** is required.

14. Intestinal Protozoa

Microscopy - (See also amoebiasis, giardiasis & cryptosporidiosis). Stool samples for the demonstration of cysts and oocysts should be forwarded with a minimum of delay. A minimum of three samples (six in the case of giardiasis) should be examined before the diagnosis is excluded.

15. Strongyloidiasis

Serology - an antibody detection ELISA test is available at SPDRL. A **minimum of 1ml of clotted blood** is required to perform the ELISA.

Microscopy and Culture - Strongyloidiasis is diagnosed by stool microscopy and stool culture for the demonstration of larvae. As these tests are relatively insensitive a minimum of at least three stools should be examined before the diagnosis is excluded. *Strongyloides* larvae (and adults) can also be demonstrated in duodenal / jejunal aspirates.

16. Schistosomiasis

Serology - A schistosome ELISA using egg antigen is a valuable 'screen' for infection. A **minimum of 1 ml clotted blood** should be taken at least **eight** weeks after the last possible date of exposure.

Microscopy - Definitive diagnosis is by demonstrating the characteristic ova in clinical material. **Only** where a patient's serum is **positive** for schistosome antibodies will 3 x stools (taken day 1, 3 and 5) and a 24hr urine be requested by the local Infectious Diseases specialist or General Practitioner which should be processed by the local microbiology laboratory. A 24 hour collection of urine is the preferred sample although the terminal portion of the first morning urine (approximately 20mls) is also acceptable.

The detection of ova from biopsy material (unfixed) *e.g*. rectum, sigmoid or bladder is also possible.

17. Toxocariasis

Serology - A *Toxocara* ELISA using the excretions / secretions of *in vitro* cultured second stage *T. canis* larvae is the method of choice for the laboratory diagnosis of toxocariasis. **A minimum of 1 ml clotted blood is required.**

18. Toxoplasmosis

Serology - ELISAs for detecting either IgG or IgM antibodies to *Toxoplasma gondii* antigens are offered. The IgG ELISA is used as a "screen" for seropositivity, whereas the IgM ELISA is used as an indicator of recent exposure / infection. **A minimum of 1 ml clotted blood is required.**

Samples which produce borderline or positive results in the IgM ELISA are referred by SPDRL to the *Toxoplasma* Reference Laboratory, Raigmore Hospital, Inverness for corroboration and further analysis. Samples requiring rapid investigations for toxoplasmosis should be sent directly to the *Toxoplasma* Reference Laboratory, Microbiology Department, Raigmore Hospital, Inverness IV2 3UJ.

19. Trichinellosis

Serology - The *Trichinella* IgG ELISA has been removed from our scope. Requests for Trichinella testing should be made directly to:

National Parasitology Reference Laboratory (NPRL)
Department of Clinical Parasitology, Hospital for Tropical Diseases
3rd floor Mortimer Market Centre
Mortimer Market
London
WC1E 6JB
https://www.gov.uk/government/publications/national-parasitology-reference-laboratory-nprl-user-manual

20. Trypanosomiasis

Serology - Tests for both African [*Trypanosoma brucei gambiense* sleeping sickness] and American (New World) [*Trypanosoma cruzi*; Chagas' disease] are available at SPDRL. No test is available that will specifically detect *T. b. rhodesiense* – if this test is required, please discuss with the Consultant Clinical Scientist.

Microscopy - African trypanosomiasis. Trypanosomes in blood or CSF are best diagnosed by submitting **a minimum 2 ml of anticoagulated blood** or CSF without delay to the SPDRL. Alternatively, stained thin blood films can be submitted for examination.

Serology - African trypanosomiasis. A LATEX assay is offered for *T. brucei gambiense*. A **minimum of 1 ml of clotted blood is required.**

Microscopy - American trypanosomiasis. During the parasitaemia associated with acute infections, trypanosomes can be sought in blood. Submit **a minimum 2 ml of anticoagulated blood** with a minimum of delay to the SPDRL.

Serology - American trypanosomiasis. Serology is most helpful in chronic infection, when parasites have been cleared from peripheral blood. We offer a *T. cruzi* IgG antibody ELISA. A **minimum of 1 ml of clotted blood is required.**

21. Analysis of specimens following prior arrangement only

Some specimens will only be accepted for analysis following prior arrangement. Such specimens include:

- **skin snips for examination for microfilaria**
- **hot stools for examination for trophozoites of pathogenic protozoa**
- **water and environmental parasitology samples**

Frequency of testing

Routine serological analyses are undertaken in batches. The following table identifies the frequency of routine serological tests undertaken at SPDRL

PARASITE	FREQUENCY
E.histolytica	**As requested**
Filaria	**Weekly**
Leishmania	**As requested**
Schistosoma	**Weekly**
Toxocara	**Weekly**
Toxoplasma*	**Weekly***
Cysticercosis	**As requested**
Echinococcus	**Weekly**
Fasciola	**As requested**
Trypanosoma	**As requested**

*Screening only - all "positive" IgM sera are forwarded to the *Toxoplasma* Reference Laboratory, Raigmore.

Request turnaround times

The turnaround time is defined as the period from the receipt and booking in of a specimen to the time the report is ISSUED to the user.

A turnaround time of ten working days from the receipt of the specimen has been identified in the Service Agreement between Greater Glasgow & Clyde NHS and Health Protection Scotland (HPS) of the Scottish Executive. This excludes malaria samples which have a TAT of 48 hrs (additional 24 hours for samples requiring further molecular testing).

Reporting of results and advisory service

All results of diagnostic importance or epidemiological value are telephoned directly to the Consultant Microbiologist and/or senior BMS staff at the submitting laboratory. Copies of the results are also faxed to the appropriate Consultant in Public Health Medicine. We routinely inform CPHMs and HPS of results that may have public health significance. Users should be aware that malaria (plasmodium) is a notifiable

disease. It is the responsibility of the clinician making the clinical diagnosis to inform HPS *via* ECOSS or e-mail nss.ecoss@nhs.net

Normally, results are entered into the computer and printed as a report on the afternoon of the day they are entered.

All tests (with the exception of those mentioned previously) can be performed and reported by telephone within 24 hours of receiving a specimen if prior notice is given. In such instances, the agreement of senior SPDRL staff must be sought before the specimen is dispatched.

Telephone communications will occur under the following circumstances:

- If it is thought that a result might lead to an immediate change in patient management
- If further information is required to decide whether the submitted sample should be processed further
- If a telephoned result has been requested

Results will usually be telephoned by the individual who has performed the test but if clinical advice may be required, the call will be made by the Consultant Clinical Scientist. If a telephone number, telephone extension or bleep number has been indicated the call will be made to that number.

Interim written reports are issued only when significant results would otherwise be delayed – this most commonly occurs when additional tests have to be undertaken to provide further information.

All reports will state whether they are interim or final though the exact wording will depend on the type of specimen and the precise circumstances. All information on the earlier report will be duplicated or superceded on the later one and both carry the same laboratory number.

Parasite Serology - Normal Reporting Practice

It is most economic to carry out serological tests in batches and, in general, serological tests are not necessarily performed as soon as a specimen is received. Most tests are batched weekly, thus when tests are carried out at the SPDRL, written reports may not be available for ten days after the specimen has reached the laboratory.

When several tests are to be carried out on the same specimen then reports are issued as results become available. Reports are not necessarily delayed to allow all tests results to be reported at once.

If urgent results are required or if you want to know when a particular result will be available then please contact the laboratory (**0141 201 8667**).

Storage of Results
Results are archived on the computer system and are available for retrieval.

Obtaining Results by Telephone
Although written reports are issued as soon as they are available, results are available by telephoning the laboratory. Users are asked to only use this service when necessary as it delays the routine work.

An attempt will be made to telephone results when this is asked for on the request form. Please indicate clearly an extension number or a bleep number that will be answered at a time when results are likely to be available – if possible give a second number as an alternative.

SECTION FOUR: Interpretation of SPDRL Results
This guidance is provided to assist in the interpretation of SPDRL results. Clinical information should be taken into account where necessary when interpreting SPDRL results. Serological tests will be reported as either positive or negative. For microscopy, when present, cysts, oocysts, ova, larvae and / or adult stages will be stated as the individual organism on the final report. Interpretation of molecular tests will describe the species present. In addition, for *Cryptosporidium* species, the subtype will also be stated if the same forms part of outbreak investigations.

Teaching, Research & Development
The Reference Laboratory is committed to the teaching of medical and technical staff and has a continuing commitment to Research & Development activities relevant to the work of the laboratory. This includes collaborative work with Microbiologists, Infection Control Nurses, Scientists and Biomedical Scientists in referring hospitals.

Problems, Complaints and Service Improvements
If any issues are encountered or any matter for complaint arises, please contact the Consultant Clinical Scientist Dr. Claire Alexander (0141 201-8637). Suggestions for improvement of the service are always welcome.