



HEALTH PROTECTION AGENCY
Microbiology Services Colindale (MSC)

LABORATORY OF GASTROINTESTINAL
PATHOGENS

USER MANUAL

November 2011

Contents

	Page
Introduction	3
<u>Contacting the LGP</u>	4
<u>CPA Accreditation</u>	5
<u>Submission of Samples</u>	6
<u>Complaints Procedure</u>	6
<u>Transport Requirements</u>	7
<u>Foodborne Pathogens Reference Unit (FPRU)</u>	9
<u>Bacillus species</u>	10
<u>Clostridium botulinum</u>	11
<u>Clostridium perfringens</u>	13
<u>Clostridium tetani</u>	14
<u>Listeria species</u>	15
<u>Staphylococcus aureus associated with food poisoning</u>	16
<u>Histamine (Scombrototoxin)</u>	17
<u>Gastrointestinal Infections Reference Unit (GIRU)</u>	18
<u>Campylobacter & related organisms</u>	19
<u>Escherichia coli</u>	20
<u>Helicobacter pylori & Helicobacter species</u>	21
<u>Shigella, Vibrio & Yersinia species</u>	22
<u>Serodiagnostic services</u>	23
<u>Salmonella Reference Unit (SRU)</u>	24
<u>Salmonella Identification, serotyping & phage typing</u>	25
MSC and LGP Policy Statements:	
<u>LGP Sample retention times</u>	27
<u>MSC Recognition of Caldicott Recommendations</u>	28
<u>MSC Policy on Faxing Reports Containing Patient Data</u>	28
<u>MSC Compliance with the Human Tissue Act</u>	29

Authorised By:

Dr Kathie Grant

Head of Laboratory Services LGP

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Page 2 of 29

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Introduction

This User Manual provides information on the activities and structure of the Laboratory of Gastrointestinal Pathogens (LGP). The LGP is part of the Health Protection Agency's Microbiology Services Colindale (MSC). The laboratory works at local, regional, national and international levels to reduce the burden of gastrointestinal infection in the UK. Our activities include national microbiological reference services for a range of gastrointestinal pathogens as well as the provision of specialist testing for the microbiological examination of clinical, food, water and environmental samples. The laboratory also undertakes research into the genetic diversity of pathogens and the development of diagnostic techniques for food, water and environmentally borne diseases. The LGP is able to offer expert advice, education and training on public health aspects of food and water microbiology and safety.

The LGP does not offer clinical advice. Advice on individual patient management is available through the Duty Doctor System via the main MSC switchboard 020 8200 6868.

LGP staff work in partnership with colleagues from other organisations such as the National Health Service (NHS), Local Authorities Co-ordinators of Regulatory Services (LACORS), Food Standards Agency (FSA), Department of Health (DoH), Emergency Response teams, commercial companies and Veterinary Laboratory Agency laboratories. Our staff examine bacterial isolates, clinical specimens and food, water and environmental samples from the NHS, environmental health officers (EHOs), commercial and other laboratories or agencies throughout the UK and overseas for monitoring and investigating food-borne disease.

LGP consists of three Units:

- Foodborne Pathogens Reference Unit (FPRU).
- Gastrointestinal Infections Reference Unit (GIRU), comprising the former E. coli, Shigella, Yersinia and Vibrio and Campylobacter and Helicobacter Reference Units.
- The Salmonella Reference Unit (SRU).

LGP is within the Bacteriology Division of Microbiology Services Colindale.

Please take some time to read the LGP User Manual carefully, in particular the revised transport requirements section. I hope that you find the information contained herein of use and I look forward to dealing with you in the future.

Dr Kathie Grant

Head of Laboratory Services, LGP

November 2011

Contacting the Laboratory of Gastrointestinal Pathogens

To contact LGP please use the following address and telephone numbers.

Address: Laboratory of Gastrointestinal Pathogens
Health Protection Agency,
Microbiology Services Colindale
61 Colindale Avenue
London
NW9 5EQ
Telephone: 020 8327 6111/6141
Fax: 020 8905 9929

LGP Contacts

To contact staff listed in the LGP User Manual please dial 020 8327 and the five digit extension number. Normal laboratory hours are from 09.00 to 17.30 Monday to Friday. For emergency work outside these times please contact the duty doctor via the switchboard (020 8200 4400)

Key Staff

LGP Head of Laboratory Services	Kathie Grant	x77117
Deputy	Tom Cheasty	x76173
Laboratory Manager	Vina Mithani	x76521
Quality Assurance Manager	Stanley Hoeck	x76157

LGP User Manual – User Feedback

The LGP welcome constructive comments on the content of the User Manual. Please send any comments in writing to Dr Kathie Grant, LGP Head of Laboratory Services at the address above.

CPA Accreditation

CPA Accredited – Ref. No. 1683

CPA standard E6.1e requires laboratories to review referral laboratories in terms of EQA performance and turnaround times. The CPA standards also state that “Referral laboratories should where possible, be accredited by CPA or equivalent accreditation body or meet the requirements of the sender’s quality management system”.

For information:

1. Our CPA Accreditation Certificate to the new standards can be found on our website: <http://www.hpa.org.uk/cfi/lep/>
2. We undertake an extensive IQA programme and, whenever possible, participate in formal and informal international EQAs with similar laboratories overseas. We can provide more specific information on EQA on separate request to the individual Unit Heads.

Dr Kathie Grant

Head of Laboratory Services, LGP

November 2011

Submission of Samples

The Health Protection Agency Microbiology Services Colindale routinely receives several hundred parcels containing pathological specimens every day.

To ensure that specimens are processed as rapidly as possible, please ensure that the name 'Laboratory of Gastrointestinal Pathogens' is clearly identified on the address label. If in doubt, please use the telephone contacts listed in this User Manual to check on the appropriate identification.

Full details of the sample or specimen will help ensure that all appropriate tests and interpretations are provided. **Requests for work on presumptive isolates that fall into ACDP Hazard Group 3 must be clearly marked to show the findings of the sending laboratory.** The clinical and epidemiological data, including the patient's address and recent travel history, requested on the form, should be regarded as essential parts of the report request.

If a specimen or sample result is required urgently, prior telephone contact with the receiving unit or laboratory will ensure priority.

To ensure that specimens or samples are not subjected to needless transport delays, please always follow the current transport regulations.

Samples may also be submitted through the Hays DX System. The address of the Laboratory of Gastrointestinal Pathogens is:

HPA Colindale, (LGP)
DX 6530008
Colindale NW

The time taken to perform identification, detection and typing tests is dependent on the receipt of pure cultures. Cultures that require purification may increase turnaround time significantly

Complaints Procedure

If there is a complaint, please telephone, write, facsimile or E-mail the key member of staff who will initiate our Laboratory Complaints procedure.

What to do:	Minor	telephone/facsimile/E-mail
	Major	write/facsimile/E-mail
Who to contact:	Minor	Unit Head/Responsible person
	Major	Head of Laboratory services

All complaints will be fully investigated and replies will be sent.

Transport Requirements

The LGP analyses cultures, clinical specimens and food, water and environmental samples. Any organisation sending out cultures or diagnostic specimens has a legal duty to ensure that such items are sent in a safe manner. Infectious substances which break or leak in transit can result in a major incident, putting those handling them and those in receipt of them at risk of infection. It is therefore vital that the correct transport requirements are followed.

A three part packing system should always be used consisting of the following:

1. The specimen itself packed in a leak proof container, individually wrapped in absorbent material in an individual plastic bag.
2. Specimens should be packed in a leak proof bottle or container with sufficient packing material to prevent damage in transit.
3. This should be placed in an approved cardboard outer container with the appropriate hazard sticker along with the specimen request forms. **Do not put the specimen request forms in the leak proof container with the specimens.**

For the purposes of transport, infectious substances fall into either Category A or Category B. Category A samples are known or suspected to contain a microbial agent which is 'an infectious substance which is transported in a form that if exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease to humans or animals'. To facilitate reference microbiology services a limited number of Category A agents are exempted from being transported as Category A. These are Vero cytotoxin - producing *Escherichia coli* (VTEC), *Mycobacterium tuberculosis* and *Shigella dysenteriae* type 1. Category B samples are those that do not meet the definitions of Category A. A detailed list can be found at the following website <http://www.advisorybodies.doh.gov.uk/acdp/managingtherisks.pdf>. Below is a summary of the relevant information.

When submitting the following Category A cultures to the LGP

- ***Clostridium botulinum***
- ***Yersinia pestis***

Notify the laboratory in advance by telephone or by using form EW0512 which can be found on our website: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1257260444537

- i. Package these in accordance with UN packaging instruction PI620(road /rail) or PI602(air) and label the packages
 - a. with UN 2814
 - b. 'Infectious substance affecting humans'
 - c. biohazard diamond mark sign
- ii. Send the samples using a licensed courier
- iii. Do not mix Category A and Category B material in the same packaging
- iv. Do not mix Advisory Committee on Dangerous Pathogens (ACDP) Hazard Group 2 (HG2) agents and Hazard Group 3 (HG3) agents in the same container
- v. Accompanying referral forms must indicate the presence of the above HG 3 organisms or any other safety information to enable MSC to assess the risks

When submitting the following Category A cultures which are exempt from being transported as Category A (see the HPA guidance on packaging samples:

http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1195733774690)

- **Vero cytotoxin - producing *Escherichia coli***
- ***Shigella dysenteriae* type 1**

- i. Notify the laboratory in advance by telephone or by using form EW0512 which can be found on our website:
http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1257260444537
- ii. Package these in accordance with UN packaging instruction PI650* and label the packages
 - a. with UN 3373
 - b. 'Infectious substance affecting humans'
 - c. biohazard diamond mark sign
- iii. Send the samples using a licensed courier. **Royal Mail will NOT accept these.**
- iv. Accompanying referral forms must indicate the presence of the above Hazard group 3 organisms or any other safety information to enable MSC to assess the risks

When submitting Category B cultures/specimens (e.g. *Campylobacter*, non-VTEC *E. coli*, *Listeria* sp, *C. perfringens*, *Bacillus* sp, *Helicobacter*, *Salmonella*, *Shigella*, *Vibrio* etc.)

- i. Package these in accordance with UN packaging instruction **PI650*** and label the packages
 - a. with UN 3373
 - b. 'Diagnostic specimens'
 - c. biohazard diamond mark sign
- ii. Do not mix Category A and Category B materials in the same packaging
- iii. Do not mix ACDP HG2 (e.g. *Salmonella* Typhimurium) and HG3 (e.g. *Salmonella* Typhi) materials in the same container.

*** MSC recommends packing everything to PI620 standards as the packaging is more robust, decreasing the likelihood of damage.**

For further details on packaging and transport of infectious substances visit the following websites:

- <http://www.advisorybodies.doh.gov.uk/acdp/managingtherisks.pdf>
- http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_075439
- <http://www.icao.int>
- <http://www.unece.org>

4. Other transport requirements

a. When submitting foods

- i. For suspected foodborne botulism notify the laboratory in advance.
- ii. Transported under conditions which minimise as far as possible any changes in microbial numbers. Frozen foods must be kept frozen, chilled foods transported at 4 C and shelf stable unopened canned and dried foods at ambient temperatures
- iii. Package frozen/chilled foods in a polystyrene box or cool box/bag containing ice packs
- iv. Send the samples using a courier.

b. Syringes with needles attached will not be accepted

Specimen Acceptance Policy

While we will make every reasonable effort to examine all referred specimens, as a CPA accredited laboratory the LGP is required to adhere to the requirements above and to ensure that our staff work safely. Referred specimens which do not meet the above guidelines may be returned to the sender unexamined. Please refer to our specimen acceptance policy, EW-0605 and EW-0714.

Foodborne Pathogens Reference Unit Services

Tel: 020 8327 7117/7539

Fax: 020 8905 9929

The Foodborne Pathogens Reference Unit (FPRU) provides the national reference facility for the epidemiological typing and/or toxin testing of a range of organisms and other agents associated with foodborne infection and intoxication. These include *Bacillus cereus* and other *Bacillus* species, *Clostridium botulinum*, *C. perfringens*, *C. tetani*, *Listeria monocytogenes* and other *Listeria* species, *Staphylococcus aureus* and scombrototoxin. The laboratory also undertakes research on various aspects of foodborne infections and intoxications including reference service improvement.

For information and advice on all aspects of microbiology relating to the services offered by FPRU either contact the Unit Head Corinne Amar (x77341) or Unit Manager Obi Mpamugo.

Summary of Services

***Bacillus cereus* and *Bacillus* species**

Clostridium botulinum

Clostridium perfringens

Clostridium tetani

***Listeria monocytogenes* and *Listeria* species**

***Staphylococcus aureus* associated with food poisoning**

***Staphylococcus aureus* enterotoxin detection in foods**

Histamine (Scombrototoxin) detection

On identification of a presumptive potential pathogen or high level of toxin the FPRU is required to notify the appropriate Environmental Health Officer, Consultant in Communicable Disease and all other relevant people. Notification must be through a designated, competent senior member of staff

Bacillus species

Services offered

Identification of *Bacillus* species.

What Samples or Specimens to Send

Pure cultures of *Bacillus* on agar slopes isolated from

- Vomitus, faeces or foods suspected to be or linked with cases of food poisoning.
- Isolates from blood cultures, or from sites that are normally sterile, or other sites where invasive or other diseases are confirmed or suspected.
- Clinical and environmental sources where cross-infection is suspected.
- Foods or beverages with levels of *Bacillus* species including *B. cereus* of $\geq 10^4$ cfu per g or ml.

As foods may be contaminated simultaneously with several species of *Bacillus*, a selection of different colonial types should be sent.

What Information to Send

Use LGP request forms L6 (clinical specimens/cultures) or L7 (food samples/cultures) referral. Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form as completely as possible including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require. Brief clinical and epidemiological information should be included with cultures from cases of infection.

Turnaround Time

Identification of *Bacillus* species:

14 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the Unit Head or Unit Manager.

Clostridium botulinum

Services offered

The diagnostic service for botulism in humans comprises the detection of *C. botulinum* neurotoxins in clinical specimens, food and environmental samples together with the isolation and identification of *C. botulinum* from food, environmental samples and clinical specimens. Tests on food and referred isolates are UKAS accredited (UKAS testing laboratory No. 1595).

What Samples or Specimens to Send

There are now five routes by which botulism can arise in humans: foodborne, intestinal colonisation, wound, accidental or deliberate. Details on clinical presentation, diagnosis and laboratory tests for *C. botulinum* are now available on the HPA website, under Guidelines for deliberate release. Antitoxin for treatment is available on request through the HPA Duty Doctor System (24 hours telephone: 020 8200 6868) for treatment of foodborne and wound botulism. Advice on treatment and prevention of infant botulism can also be obtained through the Duty Doctor System or from the Infant Botulism Treatment and Prevention Programme, California Department of Health (<http://www.infantbotulism.org/>).

Specimens should be sent immediately to the Reference laboratory. Please notify the Foodborne Pathogen Reference Unit that samples for botulinum testing are being submitted so that preparations for testing can be made

- Food and drink samples. Please transport refrigerated.
- Serum. At least 10ml to be collected as close to the onset of symptoms as possible. Serum specimens must be collected before antitoxin is given. **Lysed or EDTA treated blood specimens are not suitable**
- Faeces: At least 10 g in a sterile container. Rectal washout may be required as patients with foodborne or intestinal colonisation botulism may have diarrhoea in the early stages, followed by constipation.
- Vomitus, gastric washings or gut content: At least 10 g in a sterile container.
- Pus or debrided tissue: To be placed as soon as possible into Cooked Meat Broth or other anaerobic culture medium. If pus is not available, a swab of the lesion should be taken and put immediately into a transport medium or anaerobic culture medium.
- Post mortem specimens: Heart blood, if not haemolysed. Specimens of faeces, gut contents or infected wounds may be useful.
- For rapid detection of organism in faeces, tissue or food, samples can be inoculated into anaerobic culture media (pea sized sample in a 20 ml Reinforced Clostridia Medium or Cooked Meat Broth) and tested by PCR on receipt.
- All cultures suspected of being *C. botulinum* should be sent in a cooked meat medium.

What information to send

Use LGP request forms L6 (clinical specimens/cultures) or L7 (food samples/cultures).

Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require. Brief clinical and epidemiological information should be included with cultures from cases of infection. **If botulism is suspected, by any route, it is essential that the local CCDC should be notified immediately.**

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Page 11 of 29

Authoriser: Kathie Grant

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***Clostridium botulinum* (continued)**

Emergency Situations

During working hours contact a senior member of staff for appropriate urgent attention. Outside working hours, contact the MSC Duty Doctor (020 8200 6868). Urgent transport of specimens or samples to FPRU by taxi or courier should be considered if a clinical diagnosis of food related botulism is likely.

The local CCDC should be notified if a diagnosis of botulism is suspected. Please also notify the Centre for Infections Duty Doctor, Phone 020 8200 6868

Turnaround Times

<i>C. botulinum</i> neurotoxins in sera	5 days
<i>C. botulinum</i> neurotoxins in food/faeces	5 days
<i>C. botulinum</i> isolation and identification	9 days
<i>C. botulinum</i> identification of pure cultures	4 days

Turnaround times are shown in calendar days and reflect the proportion of tests requiring prolonged observation in order to establish a negative result. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. If neurotoxin is detected, a turnaround time of >5 days will be required to establish the toxin type.

Positive results will be reported immediately by telephone.

For further information or for the results requiring urgent attention, please contact the appropriate member of staff.

Clostridium perfringens

Services offered

Identification and typing of *C. perfringens* toxin genes in cultures, and detection of enterotoxin in faeces.

What Samples or Specimens to Send

- Pure cultures of *C. perfringens* in Cooked Meat Medium (CMM) isolated from:
 - Faeces from cases of diarrhoea obtained after alcohol shock treatment or on direct isolation
 - Faeces, gut contents or gut biopsy in cases of suspected necrotising enterocolitis
 - Foods

Faeces and food may be contaminated with several types of *C. perfringens*. It is recommended that in cases of suspected food poisoning several colony picks (three to five in separate CMM) should be sent from faeces and food.

- Faeces for enterotoxin detection in cases of diarrhoea, minimum sample \geq 1g or ml.
- Faeces, gut contents or gut biopsy in cases of suspected necrotising enterocolitis.

What Information to Send

Use LGP request forms L6 (clinical specimens/cultures) or L7 (food samples/cultures).

Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require. Brief clinical and epidemiological information should be included from cases of *C. perfringens* diarrhoea. Please indicate if a relationship with other cases by common source is suspected and if the cases are suspected to be food-borne or as a result of person to person spread.

Turnaround Times

Identification of pure cultures	7 days
Identification and molecular typing	10 days
Detection of enterotoxin in faeces	3 days
Isolation of <i>C. perfringens</i> from faeces	8 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the Unit Head or Unit Manager.

Clostridium tetani

Services Offered

The identification of toxigenic *C. tetani* (toxin gene detection) and the diagnosis of tetanus in humans by the detection of *C. tetani* neurotoxins in serum.

What Samples or Specimens to Send

- All cultures suspected to be *C. tetani* in a cooked meat medium.
- Serum at least 2 ml collected as soon as possible after admission to hospital. Serum specimen must be collected before antitoxin is given and will be tested for the presence of tetanus antibodies before toxin detection is performed.

What Information to Send

Use LGP request form L6 (clinical specimens/cultures). Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require. Brief clinical and epidemiological information should be included with cultures from cases of infection.

Turnaround Times

Toxigenicity of pure cultures (toxin gene detection)	4 days
Detection of neurotoxin in serum	5 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the Unit Head or Unit Manager.

Listeria

Services Offered

Identification of *Listeria* species, typing of *L. monocytogenes* isolates and non-cultural diagnosis of listeriosis.

What Samples or Specimens to Send

- Pure cultures on agar slopes.
- Isolates from all cases of human listeriosis should be sent for sub-typing. All reports are incorporated into a database for national surveillance of listeriosis.
- CSF or serum samples for non-culture diagnosis by PCR.
- Isolates of *L. monocytogenes* from foods should be sent for sub-typing in the following circumstances:
 - When the organism is present at >100 cfu of *L. monocytogenes* per g;
 - If the isolates form part of a co-ordinated survey or follow up investigation;
 - If there is a particular concern with a specific food product;
 - If there is an association with a case of listeriosis.

FPRU offers a service for the identification of *Listeria* species and this may be helpful when laboratories are experiencing difficulties in this area. Isolates of *Listeria* species other than *L. monocytogenes* where these are present at high numbers in food should also be sent. Foods may be contaminated simultaneously by several species of *Listeria*, or several strains of *L. monocytogenes*, multiple (ideally three to five) subcultures should therefore be examined for each sample.

What Information to Send

Use LGP request forms L6 (clinical specimens/cultures) or L7 (food samples/cultures).

Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertificate/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require. Brief clinical and epidemiological information should be included with cultures from cases of human listeriosis. A more detailed surveillance questionnaire for completion will be sent for each case.

Turnaround Times

Identification of pure cultures	7 days
Non-cultural diagnosis in CSF or serum	3 days

Further sub-typing on all isolates of *L. monocytogenes* submitted to the FPRU is available where relationships between cultures are being established. Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the Unit Head or Unit Manager.

Staphylococcus aureus enterotoxin gene detection & enterotoxin detection

Services Offered

The Foodborne Pathogen Reference Unit, together with the Laboratory of Healthcare Associated Infections (LHCAI), offers a diagnostic service for the detection of staphylococcal enterotoxin genes (A, B, C, D, E, G, H, I and J) in cultures of *S. aureus* isolated from foods, faeces and vomitus, and a service for the detection of enterotoxins A, B, C, D or E in samples of food or beverages.

What Samples or Specimens to Send

- Pure cultures of *S. aureus* on nutrient agar slopes from:
 - Food, beverages, patient's vomitus or faeces from cases of food poisoning;
 - Food handlers suspected to be associated with staphylococcal food poisoning;
 - Foods where *S. aureus* was recovered at $\geq 10^4$ cfu per g
 - Food or beverages where staphylococcal food poisoning was suspected

Minimum sample size ≥ 5 ml or 5 g

Food samples should be kept refrigerated and sent in a cooled or insulated container to arrive refrigerated.

What Information to Send

Use LGP request forms L6 (clinical specimens/cultures) or L7 (food samples/culture).

Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertificate/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require. Brief clinical and epidemiological information should be included with cultures from cases of infection.

Turnaround Times

Detection of enterotoxin genes in pure cultures	10 days
Detection of toxin (enterotoxins A, B, C, D and E) in food	4 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the Unit Head or Unit Manager. .

Histamine (Scombrototoxin) Detection

Services Offered

Detection of histamine (scombrototoxin) which is UKAS accredited (UKAS Testing Laboratory No. 1595).

What Samples to Send

- Fish or fish products.
- Cheese.

Minimum sample size 10 g

Scombrototoxin can be produced by spoilage organism at 4°C. Therefore samples for scombrototoxin should be frozen and sent to arrive in a frozen state or refrigerated to arrive within 4 hours of collection.

What Information to Send

Use LGP request form L7 (food samples/cultures). Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require. Brief clinical and epidemiological information of any suspected cases should be included with samples of food. In particular, information on the origin of the product, and batch and brand if a canned food should be sent.

Turnaround Time

Histamine (scombrototoxin)

4 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the Unit Head or Unit Manager. .

Gastrointestinal Infections Reference Unit (GIRU)

Tel: 020 8327 6173

Fax: 020 8905 9929

The Gastrointestinal Infections Reference Unit (GIRU) is the result of the integration of the former *Escherichia*, *Shigella*, *Yersinia* and *Vibrio* (ESYV) Reference Unit and the *Campylobacter* and *Helicobacter* (CH) Reference Unit. The range of reference services includes: identification to genus and species level, phenotypic and molecular typing, resistance typing and antimicrobial susceptibility testing. The Unit also offers a serodiagnostic service for *E. coli* O157 and other selected serogroups of Vero cytotoxin-producing *E. coli* (VTEC), *Salmonella* Typhi and Paratyphi A, B and C, *Yersinia enterocolitica* and *Yersinia pseudotuberculosis*. Also offered are a primary diagnostic service for *Helicobacter pylori* and detection of VTEC in faeces from clinically appropriate cases.

For information and advice on all aspects of microbiology relating to the services offered by GIRU contact the Unit Head Tom Cheasty or for more specific information the key staff listed below.

GIRU Key Staff

Organism	First Contact	Second Contact
<i>Campylobacter & Helicobacter</i>	Andy Lawson x76304	Judith Richardson x76538
<i>Escherichia coli</i>	Geraldine Smith x76146	Tom Cheasty x76173
<i>Shigella, Vibrio & Yersinia</i>	Tom Cheasty x76173	Claire Jenkins x76172
Serodiagnosis	Henrik Chart x76101	Tom Cheasty x76173

Campylobacter

Services offered

- Identification of *Campylobacter* and related organisms
- Resistance typing and antimicrobial susceptibility testing
- Epidemiological typing

We do not provide a serodiagnostic service for *Campylobacter*.

Preston Microbiology Services offer *Campylobacter* serology testing (telephone 01772 522100). LGP will impose a handling charge for dealing with such requests.

What Specimens or Samples to Send

- Pure culture sent on Amies charcoal swab (preferably) or other suitable media (i.e. blood or chocolate agar slope).

It is advisable to pick campylobacter isolates from a non-selective medium to minimize overgrowth by contaminants. If an overnight delay before posting is anticipated then the isolate should be stored at 4°C. It is not advisable to post samples on a Friday as these will remain at ambient temperature over the weekend.

What Information to Send

Use LGP request form L1 (*Campylobacter* referral). Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require.

Turnaround Time

Campylobacter identification and typing 12 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the appropriate member of staff.

Escherichia coli

Services offered

- Species identification of the genus *Escherichia*
- *E. coli* serotyping
- *E. coli* Vero cytotoxin-producing (VTEC) O157 phage typing
- Typing of VTEC O157 by variable number tandem repeat analysis (VNTR) for surveillance and epidemiology
- Comparison of VTEC O157 isolates from human, animal and food sources by pulsed gel electrophoresis (PFGE) for epidemiological investigations
- Detection, typing and subtyping of Verocytotoxin (VT) genes by PCR
- Identification by PCR of virulence genes in VTEC and in strains that may belong to other groups of *E. coli* associated with diarrhoeal illness. These enterovirulent *E. coli* include: enteropathogenic (EPEC), enteroaggregative (EAaggEC), enterotoxigenic (ETEC), enteroinvasive (EIEC), and diffusely-adherent (DAEC) strains.
- Testing of faecal samples for VTEC and other enterovirulent *E. coli*.

What Specimens or Samples to Send

- Pure culture on Dorset's Egg or Nutrient agar slopes.
- Faecal sample In standard sealed container ≥ 1 gram

When submitting a culture to LGP please pick from a non-selective medium or check the purity before sending. Submitting a pure culture significantly reduces sample processing time.

What Information to Send

Use LGP request form L2 (*E. coli*, *Shigella*, *Yersinia*, *Vibrio* referral). Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require. If you have any reason to suspect that the agent being submitted is an ACDP HG3 please indicate this clearly on form.

Turnaround Times

Identification of VTEC	8 days
Identification of other <i>E. coli</i>	14 days
Detection of VTEC from faeces	5 days
Detection of other enterovirulent <i>E. coli</i> from faeces	by arrangement

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the appropriate member of staff.

***Helicobacter pylori* & *Helicobacter* species**

Services offered

- Identification of *Helicobacter pylori* and other *Helicobacter* species
- Antimicrobial susceptibility testing (metronidazole, clarithromycin, amoxicillin, tetracycline, levofloxacin and rifabutin)
- Stool antigen (StAg) testing for *H. pylori*
- Isolation and identification of *H. pylori* from gastric biopsy material
- PCR detection of *H. pylori* & '*H. heilmanii*' from gastric biopsy material
- PCR-based detection of mutations associated with resistance to clarithromycin and tetracycline

We do not provide a serodiagnostic service for *Helicobacter*.

What Specimens or Samples to Send

- ***H. pylori* cultures:** should be harvested from a 48 to 72 hour culture. A heavy suspension (visibly cloudy) should be prepared in Dent's transport medium* or any rich broth (e.g. Brain Heart Infusion). Alternatively Amies charcoal swabs may be used. Isolates should be transported as soon as possible after harvesting.
- **Gastric biopsies** for culture of *H. pylori* should be sent without delay, preferably within 24 hours. Ideally biopsies should be sent in Dent's transport medium*. Alternatively biopsies can be sent in sterile physiological saline. If a biopsy is not posted / couriered on day of receipt in your laboratory then please store at 4°C. If delays of >96 hours are anticipated (or if biopsies are culture-negative in the sender laboratory), these samples may only be suitable for detection and antibiotic susceptibility testing by PCR. Such biopsies should be frozen (-20°C)
- **Faecal samples for StAg testing** of > 1 gram should be sent in standard sealed specimen containers. Patients **MUST NOT have taken any antibiotics or proton pump inhibitors** for a minimum of **2 weeks** prior to specimen collection for testing. Samples should be sent within 3 days of collection. Where a delay is unavoidable, stools should be stored at 4°C or frozen if a longer delay of >3 days is anticipated.

What Information to Send

Use LGP request form L3 (*Helicobacter* referral). Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require.

Turnaround Times

<i>H. pylori</i> detection, identification and susceptibility testing	15 days
Detection of <i>H. pylori</i> faecal antigen	15 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the appropriate member of staff.

*Dents transport medium is available free of charge from GIRU on request.

Shigella, Vibrio & Yersinia species

Services offered

- Species identification of the genus *Shigella*
- Serotyping of *Sh. dysenteriae*, *Sh. flexneri* and *Sh. boydii*
- Phage typing of *Sh. sonnei*
- Species identification of the genus *Yersinia* (including *Yersinia pestis*)
- Serotyping of *Y. enterocolitica* and *Y. pseudotuberculosis*
- Species identification of the genus *Vibrio* (including *Plesiomonas shigelloides*)
- *V. cholerae* serotyping

What Specimens or Samples to Send

- Pure culture on Dorset's Egg or Nutrient agar slopes.

When submitting a culture to LGP please pick from a non-selective medium or check the purity before sending. Submitting a pure culture significantly reduces sample processing time.

What Information to Send

Use LGP request form L2 (*E.coli*, *Shigella*, *Yersinia*, *Vibrio* referral). Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require.

Turnaround Times

<i>Shigella</i> , <i>Vibrio</i> and <i>Yersinia</i> identification	14 days
<i>Shigella</i> phage typing	9 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the appropriate member of staff.

Serodiagnosis

Services offered

A serodiagnostic reference service is offered for the following bacteria:

- *Escherichia coli* O157
- *Salmonella* Typhi
- *Salmonella* Paratyphi A, B and C
- *Yersinia enterocolitica*
- *Yersinia pseudotuberculosis*

We do not provide a serodiagnostic service for *Campylobacter* or *Helicobacter*.

Preston Microbiology Services offer *Campylobacter* serology testing (telephone 01772 522100). LGP will impose a handling charge for dealing with such requests.

What Specimens or Samples to Send

- Sera aliquots of not less than 500 µl

Please note that if a patient has undergone renal dialysis or received a blood transfusion as part of their current therapy, this can adversely affect tests for detecting antibodies to *E. coli* O157. Please provide information on request form if any of these treatments have been performed.

What Information to Send

Use LGP request form L5 (Serodiagnosis – *E.coli*, *Yersinia*, *Salmonella* – referral). Request forms can be found on our website:

<http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate and what testing you require.

Turnaround Times

<i>E. coli</i> O157	5 days
<i>Yersinia</i> species.	5 days
S. Typhi, S. Paratyphi A, B and C	5 days

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the appropriate member of staff.

Salmonella Reference Unit

Tel: 020 8327 6136

Fax: 020 8200 8264

The Salmonella Reference Unit (SRU) provides the national reference facility for the epidemiological typing of Salmonella. The Unit is also responsible for the publication of the newly updated version of the Kauffmann-White Scheme, the definitive listing of all essential serological characteristics of *Salmonella* (available from the HPA website).

For information and advice on all aspects of microbiology relating to the services offered by SRU contact the Unit head Elizabeth de Pinna or for more specific information the key staff listed below.

SRU Key Staff

Service	First Contact	Second Contact
Salmonella identification	Elizabeth de Pinna x76136	Steve Connell x76142
Salmonella phage typing	Elizabeth de Pinna x76136	Lisa Siorvanes x76134

Salmonella

Services offered

- Salmonella identification
- Serotyping of all *Salmonella* species.
- Phage typing for *Salmonella enterica* serotypes Typhi, Paratyphi A, B and C, Paratyphi B var. Java, Agona, Enteritidis, Hadar, Pullorum, Thompson, Typhimurium, Virchow.
- Supply of phage-typing reagents to WHO affiliated reference laboratories and other approved laboratories within the European Union.
- Training in phage-typing techniques for staff from the above laboratories.
- Monitoring of resistance to antimicrobial drugs of therapeutic and epidemiological relevance;
- Investigation of the genetic basis of antibiotic resistance in enteric bacteria;
- Development and use of new and improved electrophoretic, DNA probe- and PCR-based molecular methods to supplement serotyping and phage typing for outbreak investigations.

What Samples to Send.

- **Suspect Salmonella cultures:** should be submitted on nutrient agar or Dorset's egg slopes in screw-capped containers
- **Urgent submissions:** Advise the Unit by telephone of any urgent specimen that is being dispatched to the Unit.

What Information to Send

Use LGPrequest form L4 (*Salmonella* referral). Request forms can be found on our website: <http://www.hpa.org.uk/ProductsServices/InfectiousDiseases/LaboratoriesAndReferenceFacilities/LaboratoryOfGastrointestinalPathogens/LGPUUserManualReferralRequestFormsAccreditationCertifica/>.

Please complete the correct request form including your address and telephone number, patient (specimen) details including your reference number, major patient symptoms, recent travel history, your identification of the isolate including the hazard group and what testing you require.

Turnaround Times

<i>Salmonella</i> identification and serotyping	25 days
<i>Salmonella</i> phage typing	20 days*
Other services	by arrangement

Turnaround times are shown in calendar days and are based on average monthly figures for processing 75% of specimens. They are dependant upon receipt of sample and request as described above and may vary dependent upon the clinical or public health urgency. Urgent results will be communicated by telephone. For further information or for the results requiring urgent attention, please contact the appropriate member of staff.

*Urgent phage typing requests will be processed within 10 working days

Water and Environmental Microbiology Reference Unit Services have now been transferred to London Food, Water and Environmental Microbiology Laboratory

Services Offered

Water and Environmental Microbiology Reference Unit provides national and international services for the investigation of waterborne infections. These services include:

- Organisation and assistance in the investigation of outbreaks of water borne disease, in particular legionnaires' disease.
- Advice on the microbiological hazards associated with all kinds of water use and the control of these hazards in particular: all aspects of the control of *Legionella pneumophila* the cause of legionnaires' disease;
- Advice on the control of microbiological hazards in swimming, hydrotherapy and spa pools;
- Advice on methods for the sampling and detection of microorganisms in water and the environment.

For further information or to arrange for any of the above services please contact a member of WEMRU staff on 0208 327 7247

LGP Sample Retention Times

Cultures

- **Salmonella species:** Cultures for identification are kept for a minimum of three months after reporting. Cultures for phage typing are kept for approximately six weeks because of space constraints. However, as part of testing regimen, a duplicate slope is prepared which is kept for a minimum of two years.
- ***E. coli*, *Shigella*, *Vibrio* and *Yersinia*:** Cultures for identification are kept for a minimum of one year.
- ***Campylobacter* and *Helicobacter*:** Cultures are kept for a minimum of three months.
- **Cultures referred to FPRU:** Isolates are kept for a minimum of two years.

Faeces

- ***H. pylori* StAg:** Aliquots of samples are stored at -20°C for three months.
- **VTEC and other enterovirulent *E.coli*:** Samples are kept for two months.

Serum

- ***E. coli* O157, *Yersinia*, *Salmonella* Typhi and Paratyphi:** Sera are kept for a minimum of one year.

Gastric biopsies

- **Biopsies for *H. pylori* isolation:** Are cultured and frozen on day of arrival. If the culture is negative after 10 days then the biopsy would undergo DNA extraction for a PCR assay. If the culture is positive then the biopsy will still be kept for extraction for internal quality assurance purposes. Biopsies per se are not kept but a subset of DNA extracts will be retained for the development / validation of future assays.

Food samples and clinical material referred to FPRU

- Clinical specimens and food samples that test negative are kept for minimum of six months whilst those that test positive are kept indefinitely.

Requests for further testing will be accepted within the retention times above, but unless agreed with the Unit Head these will be performed at the convenience of the Unit concerned.

MSC recognition of Caldicott recommendations

The recommendations of the Caldicott Report (1997) have been adopted by the HPA as by the National Health Service as a whole. These recommendations relate to the security of patient identifying data (PID) and the uses to which they are put. The Microbiology Services (Colindale) observes Caldicott guidance in handling PID and has appointed its own Caldicott Guardian who advises the Director, MSC, on confidentiality issues and is responsible for monitoring the physical security of PID in all parts of MSC. This also applies to the transfer of results of investigations to and from MSC whether by mail services, telephone or fax. The value of 'safe haven' arrangements or other means of the sender and receiver of information identifying themselves to each other before data is transferred is emphasised (see attached MSC Policy on faxing and e-mailing reports containing patients' data).

MSC is anxious to audit the security of its PID in collaboration with its customers. Customers are invited to review our arrangements in conjunction with individual Laboratory Directors and/or the MSC Caldicott Guardian. Customers are also asked to draw to the MSC Caldicott Guardian's attention any instances where PID security has been threatened or has broken down. Uses that PID are put to outside clinical diagnostic services generally allow patient identifiers to have been removed before hand, and when PID is used for research purposes the proposals are considered first by the appropriate Ethics Committee. All enquiries about the security and use of PID should be addressed to the Caldicott Guardian, Fortune Ncube.

MSC policy on faxing and e-mailing reports containing patients' data

The following guidelines are consistent with the Department of Health (DoH) and Caldicott recommendations:

It is MSC policy that reports containing patient data should not be sent by fax or E-mail.

In exceptional circumstances it may be necessary to send a result by fax but not by E-mail. In this case the following conditions must be adhered to after discussion with the Laboratory. Refer also to the document "MSC recognition of Caldicott recommendations".

The report must be sent to a "safe-haven" fax machine. This means that, if the location is in general use, consideration must be given to ensuring that unauthorised personnel are unable to read reports, accidentally or otherwise. Also, the room housing the fax machine must be a secure location, which is locked if it is likely to be unattended at the time the fax is sent.

Assurance must be sought from the intended recipient of the faxed report, preferably in writing, that the receiving fax machine is a safe-haven. LGP has a "safe-haven" fax machine (020 8905 9929).

Measures must be taken to minimise the risk of misdialling, either by double-checking numbers or having frequently used numbers available on the fax machines memory dial facility.

Confirmation must always be sought from the intended recipient that the fax is expected and has been received.

MSC Compliance with the Human Tissue Act

Submitting tissue samples from deceased people:

Microbiology Services (Colindale) is licensed by the Human Tissue Authority (HTA) (Licence number 12459) to store tissues from deceased people for scheduled purposes. Post mortem samples are submitted to MSC by coroners or pathologists for examination to help them determine the cause of death.

Obtaining consent to remove, store and use human tissues for a scheduled purpose is one of the underlying principles of the Human Tissue Act. MSC receives post-mortem samples from Coroners' post-mortems or from NHS establishments across the UK and therefore we are performing the examination under the authority of the coroner. Unless consent has been obtained or the coroner has requested that samples are retained for further testing, samples are disposed of within three months of the initial test being performed.

When tissue samples from deceased people are received at the MSC they are retained securely and confidentiality is maintained in compliance with Caldicott principles as are all samples received at this centre. It is normal practice for tissue samples from the deceased to be disposed of in the same way that all other clinical samples we receive at MSC are disposed of. However, we will adhere to any specific requirements regarding disposal or returning tissue samples if requested by the sending coroner or pathologist.