**GENERAL INFORMATION**

The Antimicrobial Reference Laboratory (ARL) is part of the Department of Medical Microbiology of the North Bristol NHS Trust on the Southmead Hospital site. It provides a comprehensive antimicrobial assay service for the purposes of therapeutic monitoring and supporting consultative advice on technical aspects and clinical interpretation of antimicrobial assays.

**STAFF**

ARL has the services of Consultant Medical Microbiologists, Clinical Scientists, Assay Scientists, Biomedical Scientist and various support staff.

**CONTACT TELEPHONE NUMBERS AND OUT-OF-HOURS SERVICE**

General Inquiries between 9 am and 5 pm Monday to Friday

0117 323 5698/5654

International queries may be made via email to staff as indicated below

Out-of-hours assays can be arranged if there is a clinical need, but you should telephone and discuss your requirements with a Medical Microbiologist or Clinical Scientist beforehand. Advice can be given out-of-hours, please contact the Hospital switchboard (0117 950 5050) and ask them to contact the on-call Medical Microbiologist. **Samples can be assayed out-of-hours ONLY if prior agreement has been made.**

Results and general inquiries 0117 323 5698/5654

**Service Enquiries**

Prof Andrew Lovering, Consultant Clinical Scientist 0117 323 4311

andrew.lovering@nbt.nhs.uk

Dr Kim Jacobson, Consultant Medical Microbiologist 0117 323 5652

kim.jacobson@nbt.nhs.uk

Miss Nicola Childs Laboratory Manager 0117 323 5658

nicola.childs@nbt.nhs.uk

**Billing Enquiries**

Mrs Josephine Poad, Secretary 0117 323 5651

josephine.poad@nbt.nhs.uk

**Quality Enquiries**

Mrs Kate Seaman, Quality Manager 0117 323 5660

kathleen.seaman@nbt.nhs.uk

**Financial Enquires**

Finance Dept (Financial information only) 0117 323 3921

1 These guidelines are valid for 2 years from the shown date
SERVICES

ANTIMICROBIAL ASSAYS
Clinical assays of serum drug concentrations are indicated in the following situations
• drugs with a known or suspected relationship between concentrations in blood and toxicity
• drugs with a known or suspected relationship between concentrations in blood and efficacy
• where there is pharmacokinetic variation such that concentrations in blood cannot be predicted
• to confirm oral absorption
• to test compliance
While only a few antimicrobials (for example aminoglycosides) require routine monitoring, estimation of serum concentrations can be of value with many more. Against each antimicrobial outlined below we have cited indications where our requesters have found these assays to be of clinical value.

The Antimicrobial Reference Laboratory routinely provides a wide range of antimicrobial assays. Some of these are routinely performed in large numbers and no advance warning is required if the sample is to arrive during a normal working day; others are performed less frequently and advance warning is essential if a same-day service is required (see Table).

In addition more specialist assays can be performed by prior arrangement. These include various β-lactams, anti-fungals and anti-mycobacterial analytes. Advice can be obtained on, development of HPLC assays, problems with immunoassays and patient-related issues.

MICs, MBCs and SBTs
Minimum inhibitory concentrations (MICs) and minimum bactericidal concentrations (MBCs), population analysis profiles (PAPs) and serum bactericidal titres (SBTs) can be performed on patients isolates and sera. Here advance warning is essential and such requests should be discussed initially with a member of staff.

Service users who require more information as to the range of services offered and their application should contact a Medical Microbiologist or Clinical Scientist.

These guidelines are valid for 2 years from the shown date
### ANALYTES TESTED

<table>
<thead>
<tr>
<th>Class</th>
<th>Agent</th>
<th>See note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antibacterials</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amikacin</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Benzylpenicillin</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Ceftazidime</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Chloramphenicol</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Ciprofloxacin, levofloxacin or ofloxacin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Daptomycin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Flucloxacillin</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Gentamicin</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Meropenem</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Teicoplanin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Tobramycin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Vancomycin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Sulphamethoxazole + trimethoprim</td>
<td>B</td>
</tr>
<tr>
<td><strong>Antifungals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flucytosine</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Itraconazole</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Posaconazole</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Voriconazole</td>
<td>B</td>
</tr>
<tr>
<td><strong>Antimycobacterials</strong></td>
<td>Ciprofloxacin, levofloxacin or ofloxacin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Cycloserine</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Linezolid</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Moxifloxacin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Rifabutin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Rifampicin</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Streptomycin</td>
<td>B</td>
</tr>
<tr>
<td><strong>Antivirals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aciclovir</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Ganciclovir</td>
<td>B</td>
</tr>
</tbody>
</table>

Note A: Advance warning not normally required  
Note B: Advance warning only for Saturdays, and Public Holidays  
**Note C: 24 hour advance warning essential**
PROCEDURE FOR REFERRAL

• Give us advance warning by telephone where required (see Table). **If the sample is likely to arrive on a Saturday, Sunday, public holiday or out-of-hours then advance warning should ALWAYS be given for every antimicrobial.**

• Take appropriate blood samples (pre dose and 1 hour post dose for most agents but check relevant information for individual agents).

• Separate serum. **PLEASE DO NOT SEND WHOLE BLOOD.**

• Place serum in a watertight leak-proof screw-top tube **PLEASE DO NOT SEND TUBES WITH PUSH-ON TOPS**

• Clearly identify high-risk samples.

• Heat inactivate the serum (see below) if necessary.

• Pack together with a copy of our request form, or your own laboratory request form and ensure this has your **address and telephone/fax number.** Give the appropriate clinical information (see individual antimicrobials). This is especially important if clinical interpretation is required or with once-daily aminoglycoside dosing since high peak concentrations and low trough concentrations require the use of special laboratory protocols.

• Comply with safety requirements and ship using an appropriate carrier (see shipping requirements and individual antimicrobials).

**NOTE.** First class post cannot be guaranteed to arrive the next day.

HEAT INACTIVATION FOR HIGH-RISK SAMPLES

• Separate the serum and heat to 56°C for at least 45 minutes. But see individual agent information. Mark the request form “**Sample heat inactivated**”

• Ensure the samples are labelled as high-risk.

SPECIFIC REQUIREMENTS FOR INDIVIDUAL ANTIMICROBIALS

These are listed in alphabetical order on the pages that follow. *Please read the appropriate information carefully before sending samples as it may not be possible to assay samples that have been inappropriately handled.*

**Note:** leaking samples may not be processed
**SHIPPING REQUIREMENTS**

**Infectious specimens** must be packaged according to UN 3373 requirements as outlined below.

---

**SAFETY NOTE: DO NOT PLACE DRY ICE (SOLID CO\(_2\)) INSIDE UN602 PACKS**

Infectious substances will only be transported in the UK by the Royal Mail in packaging, which meets the UN Class 6.2 specifications and the 602 packing requirements. This ensures that the packaging complies with strict performance tests including a 9 metre drop test and a puncture test and also bears a UK packaging specification label. The pack consists of three layers:

1. The **primary receptacle** containing the sample which must be watertight and leak-proof and wrapped in enough absorbent material to absorb all fluid in case of breakage.
2. The **secondary receptacle**. A durable watertight and leak-proof receptacle to protect the primary receptacle. Several wrapped primary receptacles may be placed in one secondary receptacle. Sufficient absorbent material must be used to cushion multiple primary receptacles.
3. The **outer package** which consists of a cardboard box usually measuring approximately 18x10x10 cm and bearing a warning label saying “INFECTIOUS SUBSTANCE IN CASE OF DAMAGE OR LEAKAGE IMMEDIATELY NOTIFY PUBLIC HEALTH AUTHORITY” and marked UN Class 6.2.

Whether all samples of serum sent for antibiotic assay are “infectious material” is open to debate. Clearly if there are viable viral, bacterial or fungal pathogens in the serum the sample must be considered “infectious”. Even if a sample has been heat treated to inactivate HIV etc it might reasonably considered potentially infectious.

We can return packs to laboratories that subscribe to the Royal Mail Response Service or if pre-paid return labels are enclosed.

---

**POSTAL ADDRESS FOR SAMPLES**

Samples should be securely packed conforming to current shipping regulations (see above) and sent together with the request form addressed as follows:

**URGENT SAMPLE FOR “DRUG NAME” ASSAY**

THE ANTIMICROBIAL REFERENCE LABORATORY

DEPARTMENT OF MEDICAL MICROBIOLOGY

LIME WALK BUILDING

SOUTHMEAD HOSPITAL

WESTBURY-ON-TRYM

BRISTOL BS10 5NB

UK

---

These guidelines are valid for 2 years from the shown date.
DX COURIER

Alternatively, DX may be used to send us specimens in UN 602 packs that they supply. All DX subscribing laboratories may send us samples using the DX network. DX has advantages over First Class post, namely:

- Pick up after 5 p.m.
- Next day delivery before 9 a.m.
- Recycling of UN 602 packages.

**DX address for samples**

<table>
<thead>
<tr>
<th>URGENT SAMPLE FOR “INSERT DRUG NAME” ASSAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE ANTIMICROBIAL REFERENCE LABORATORY</td>
</tr>
<tr>
<td>SOUTHMEAD HOSPITAL</td>
</tr>
<tr>
<td>DX 6121302</td>
</tr>
<tr>
<td>WESTBURY-ON-TRYM</td>
</tr>
<tr>
<td>90 BS</td>
</tr>
</tbody>
</table>

**COMMUNICATIONS**

For some assays (marked C in the Table) 24 hours advance warning is essential to guarantee the results can be communicated back to requesters on the day of receipt of the sample. For others (marked A or B in the Table) this is not usually necessary. However for those assays marked B if there is a requirement for assays to be done on Saturdays, Sundays, public and statutory holidays, or outside normal working hours, then advance warning is essential.

The results of all assays are telephoned or (by arrangement, see below) faxed to requesting laboratories as soon as they are available. Requesters should ensure that samples likely to arrive at weekends, during holiday periods or outside normal working hours are accompanied by an appropriate contact name and current telephone number. Results on Saturdays may not be available until after 12 noon and it may be necessary for us to contact the on-call Microbiologist. It would be useful to have the hospital ward name/number for all patients in case it proves impossible to contact the Microbiologist.

Follow-up paper reports of telephoned or faxed results are computer-generated, laser-printed and sent by Royal Mail. These may arrive two or more days after the sample has been assayed. The telephoned/faxed result given to the Microbiologist should be the result that is passed on to clinical colleagues since the paper report, which is a confirmatory report, may arrive too late to be of clinical value.
FAXING RESULTS

Departments wishing to receive their initial results by fax rather than voice should contact us. Once we have been supplied with a fax number we can transmit all subsequent requests on a customised form headed "URGENT ANTIBIOTIC ASSAY RESULT TO <name of requesting department>". Faxed returns will include, antibiotic, result(s) in mg/L, patient name, patient DOB, date of sample, type of sample, requester laboratory number, Southmead laboratory number.
**RISK GROUPS AND THERAPEUTIC RANGES FOR ANTIBACTERIALS**

We recommend that in most situations paired pre (trough) and post (peak) dose samples are sent to us. Our test pricing structure reflects this. For many antimicrobials the pre-dose sample may have more clinical relevance than the post-dose sample but it may be difficult to interpret a pre-dose level in isolation. For example a pre-dose streptomycin level of <1 mg/L in association with a post-dose level of 22 mg/L could be considered “normal”. However taken in isolation the pre-dose level could mean that the streptomycin dosage was too low (or streptomycin had not been given!). Similarly a once-daily-gentamicin trough of <1 mg/L does not confirm that a correct once-daily dosage has been given; it merely confirms that there is no accumulation of gentamicin. A study found 29% of patients supposedly on once-daily gentamicin had a peak of <5 mg/L (Abstracts of 5th ICTDM & CT (1997), *Therapeutic Drug Monitoring* 19 (5), Abstract 90)

So-called “random” or “time unspecified” levels are difficult, and may be impossible, to interpret unless they are overtly above the normal peak concentration. “Random” levels taken to determine whether another dose should be given are strictly pre-dose levels. The Tables below and overleaf give a guide to the types of patients who should have levels measured and typical (normal) levels that might be expected in patients on appropriate dosage regimens.

**TRAINING COURSES**

Every year, in association with The University of the West of England (UWE), the Bristol Centre for Antimicrobial Research and Evaluation (BCARE) and the UK NEQAS for Antibiotic Assays we run a residential antibiotic-testing course. This covers, over 4 days, technical and clinical aspects relating to susceptibility testing and assays. Please write to Dr Karen Bowker, Antimicrobial Reference Laboratory, Department of Medical Microbiology, Lime Walk Building Southmead Hospital, Westbury-on-Trym, Bristol BS10 5NB for further details

Individual antimicrobials are listed alphabetically on pages that follow
**ACICLOVIR**

**Indications**
Requesters have found these assays to be of value in patients with renal failure and/or on ECMO, in cases of suspected neurotoxicity, or suspected poor absorption and in some patients receiving valaciclovir.

**Advance warning**
Not usually required (but see page 3).

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a **pre dose sample and a post dose sample**, taken either 1h after the end of iv administration or 2h after oral administration.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples, clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
**AMIKACIN**

**Indications**
Requesters have found these assays to be of value in all patients treated for >48 hours.

**Advance warning**
Not usually required

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample for either iv/im administration.
For further information on sample timings during once daily administration, please refer to the section on therapeutic ranges at the start of this guide.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples; especially important with once-daily dosing
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations. Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday and by 10 am on a Saturday. A written confirmation report will be sent by post.
BENZYPENICILLIN (PENICILLIN G)

Indications
Requesters have found these assays to be of value in cases of suspected neurotoxicity and patients with renal impairment and/or receiving high doses.

Advance warning
Please telephone at least one day in advance of the sample.

Special Requirements
*Samples should NOT be sent by post since the drug is liable to degradation*
Send by courier, frozen or on ice

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
Telephone for advice if HIV positive.
Samples should NOT be sent by post since the drug is liable to degradation
Send by courier, frozen or on ice

Timing of samples
We recommend a pre dose sample and a post dose sample, taken 1h after the end of iv/im administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.

These guidelines are valid for 2 years from the shown date
**Indications**
Requesters have found these assays to be of value in children and adults treated with continuous infusion and/or with severe sepsis and/or with pathogens of reduced susceptibility to ceftazidime.

**Advance warning**
Please telephone at least one day in advance of the sample.

**Special Requirements**
*Samples should NOT be sent by post since the drug is liable to degradation*
Send by courier, frozen or on ice

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
Please telephone for advice if HIV positive.

**Timing of samples**
We recommend a pre dose sample and a post dose sample, taken 1h after the end of iv administration.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
**CHLORAMPHENICOL**

**Indications**
Requesters have found these assays to be of value in all neonates and occasionally in children or adults.

**Advance warning**
Not usually required (but see page 3).

**Special Requirements**
Chloramphenicol is degraded by light; please ensure the samples are protected from direct sunlight.

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample and a post dose sample, taken **2h** after the end of either iv administration or oral administration.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary. It would be useful to be informed of any ß-lactam therapy.
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday. Samples can only be assayed on a Saturday by prior arrangement.
A written confirmation report will be sent by post.
CIPROFLOXACIN

Indications
Requesters have found these assays to be of value in monitoring compliance and/or anti-mycobacterial therapy and/or patients with renal failure and/or pathogens of reduced sensitivity. Also to confirm oral absorption.

Advance warning
Not usually required (but see page 3).

Special Requirements
Ciprofloxacin is degraded by light; please ensure the samples are protected from direct sunlight.

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken either 1 h after the end of iv administration or 2 h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
CYCLOSERINE

Indications
Requesters have found these assays to be of value in all patients receiving this drug as part of anti-TB therapy.

Advance warning
Not usually required (but see page 3).

Sample required
1-2 mL of separated serum (but as little as 100 µL can be processed)
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken 3-4h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important, esp. pyrazinamide)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will usually be telephoned/faxed within three days depending on the day of receipt.
A written confirmation report will be sent by post.
**DAPTOMYCIN**

**Indications**
Requesters have found these assays to be of value in patients with difficult infections and/or impaired renal function.

**Advance warning**
Not usually required (but see page 3).

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample and a post dose sample, taken 1h after the end of iv administration.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
FLUCLOXACILLIN

Indications
Requesters have found these assays to be of value in patients transferring from iv to oral therapy, cases of suspected neurotoxicity, and patients with severe sepsis and renal failure.

Advance warning
Please telephone at least one day in advance of the sample.

Special Requirements
Samples should NOT be sent by post since the drug is liable to degradation
Send by courier, frozen or on ice

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
Telephone for advice if HIV positive.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken either 1h after the end of iv/im administration or 2h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
**FLUCYTOSINE**

**Indications**
Requesters have found these assays to be of value in all patients treated for >48 hours.

**Advance warning**
Not usually required (but see page 3).

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample and a post dose sample, taken 1h after the end of iv administration.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
GANCICLOVIR

Indications
Requesters have found these assays to be of value in patients with renal failure and to monitor oral absorption, particularly in patients receiving valganciclovir.

Advance warning
Not usually required (but see page 3).

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken either 1h after the end of iv administration or 2h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
**GENTAMICIN**

**Indications**
Requesters have found these assays to be of value in all patients treated for >48 hours.

**Advance warning**
Not usually required (but see page 3).

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample and a post dose sample, taken 1h after the end of iv/im administration.
For further information on sample timings during once daily administration, please refer to the section on therapeutic ranges at the start of this guide.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples; *especially important with once-daily dosing*
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations. Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday and by 10.00 am on a Saturday. A written confirmation report will be sent by post.
ITRACONAZOLE

Indications
Requesters have found these assays to be of value in all patients whether on prophylaxis or treatment.

Advance warning
Not usually required (but see page 3).

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken 2h after oral administration or 1h post iv infusion.
For further information on sample timings during once daily administration, please refer to the section on therapeutic ranges at the start of this guide.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples;
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
LINEZOLID

Indications
Requestors have found these assays to be of value in liver failure (Childs-Pugh type C), to confirm absorption, with unusual therapeutic interventions (i.e.: continuous infusion or patients supported by ECMO), and in situations where there may be significant pharmacokinetic variability (i.e.: ICU patients).

Advance warning
Not usually required (but see page 3).

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken either 1h after the end of iv administration or 2h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
**MEROPENEM**

**Indications**
Requesters have found these assays to be of value in patients with difficult infections, continuous infusion, and/or impaired renal function.

**Advance warning**
Please telephone at least one day in advance of the sample.

**Special Requirements**
Samples should NOT be sent by post since the drug is liable to degradation
Send by courier, frozen or on ice.

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample and a post dose sample, taken 1h after the end of iv administration.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
MOXIFLOXACIN

Indications
Requesters have found these assays to be of value in patients with renal or hepatic failure and/or to confirm oral absorption.

Advance warning
Not usually required (but see page 3).

Special Requirements
Moxifloxacin is degraded by light; please ensure the samples are protected from direct sunlight.

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable volume is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken 2h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples sent by post must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
OFLOXACIN/LEVOFLOXACIN

Indications
Requesters have found these assays to be of value in monitoring compliance and/or patients with renal failure and/or pathogens of reduced sensitivity; and also to confirm oral absorption.

Advance warning
Not usually required (but see page 3).

Special Requirements
These drugs are degraded by light; please ensure the samples are protected from direct sunlight.

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken either 1h after the end of iv administration or 2h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples sent by post must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
Results will be telephoned on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
POSACONAZOLE

Indications
Requesters have found these assays to be of value in patients with gastrointestinal dysfunction, therapy with proton pump inhibitors to confirm optimal oral absorption.

Advance warning
Not usually required (but see page 3).

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample taken immediately before administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples sent by post must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
**RIFABUTIN**

**Indications**
Requesters have found these assays to be of value in patients receiving agents that have known drug interactions with rifabutin (such as clarithromycin, a number of antifungal agents and many of the antiviral agents used to treat HIV infection) and in cases of suspected toxicity.

**Advance warning**
Not usually required (but see page 3).

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample and three post dose samples, taken 1h, 2h and 4h after oral administration.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current postal regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
RIFAMPICIN

Indications
Requesters have found these assays to be of value in testing compliance or oral absorption or in cases of unexpected therapeutic failure.

Advance warning
Not usually required (but see page 3).

Special Requirements
Please note that rifampicin binds to glass and plastics and therefore there may be a significant loss of drug if a small volume of serum is dispatched in a relatively large container. Please try and fill the container to 2/3 -3/4 its capacity.

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample taken 1h after iv administration or three post dose samples, taken 1h, 2h and 4h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current postal regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
Results will be telephoned on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
**STREPTOMYCIN**

**Indications**
Requesters have found these assays to be of value in all patients treated for >48 hours.

**Advance warning**
Not usually required (but see page 3).

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample and a post dose sample, taken 1h after the end of iv/im administration.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received. Streptomycin can only be assayed on Saturdays by prior arrangement.
A written confirmation report will be sent by post.
SULPHAMETHOXAZOLE (IN CO-TRIMOXAZOLE)

see also trimethoprim

Indications
Requesters have found these assays to be of value in patients with renal failure and/or high-dose co-trimoxazole therapy. Also in monitoring absorption in neutropenic patients.

Advance warning
Not usually required (but see page 3).

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive. Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken either 1h after the end of iv administration or 2h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report, phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform to current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
**TEICOPLANIN**

**Indications**
While not indicated in all patients, therapeutic drug monitoring may be of value in severe sepsis, MRSA infection, deep-seated staphylococcal infection, bone and joint infection, iv drug mis-users, infective endocarditis, unexpected therapeutic failure, and elderly or renally impaired patients.

**Advance warning**
Not usually required (but see page 3).

**Special Requirements**
Please note that teicoplanin binds to glass and plastics and therefore there may be a significant loss of drug if a small volume of serum is dispatched in a relatively large container. Please try and fill the container to 2/3 - 3/4 its capacity.

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations. Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received. Teicoplanin can only be assayed on a Saturday by prior arrangement.
A written confirmation report will be sent by post.
**TOBRAMYCIN**

**Indications**
Requesters have found these assays to be of value in all patients treated for >48 hours and particularly in patients with cystic fibrosis who are receiving tobramycin once a day.

**Advance warning**
Not usually required (but see page 3).

**Sample required**
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

**Timing of samples**
We recommend a pre dose sample and a post dose sample, taken 1h after the end of iv/im administration.
For further information on sample timings during once daily administration, please refer to the section on therapeutic ranges at the start of this guide.

**Information required**
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

**Other information**
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

**Target turn-round time**
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday and by 10.00 am on a Saturday.
A written confirmation report will be sent by post.
TRIMETHOPRIM (IN CO-TRIMOXAZOLE)

see also sulphamethoxazole

Indications
Requesters have found these assays to be of value in patients with renal failure and/or high-dose co-trimoxazole therapy. Also in monitoring absorption in neutropenic patients.

Advance warning
Not usually required (but see page 3).

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample and a post dose sample, taken either 1h after the end of iv administration or 2h after oral administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples. Please make it clear if the patient is receiving trimethoprim alone.
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations. Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.
VANCOMYCIN

Indications
Some requesters have found these assays to be of value in all patient groups treated for >48 hours while others consider them of value only in clinically defined sub-groups of patients.

Advance warning
Not usually required (but see page 3).

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample.
For further information, please refer to the section on therapeutic ranges at the start of this guide.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples; peak should be taken 1 hour after the end of the infusion to ensure the distribution phase has been completed.
Clinical summary
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday and by 10.00am on a Saturday. A written confirmation report will be sent by post.
VORICONAZOLE

Indications
Requesters have found these assays to be of value in patients with gastrointestinal dysfunction, therapy with proton pump inhibitors to confirm optimal oral absorption and lack of clinical response.

Advance warning
Not usually required (but see page 3).

Sample required
Approx. 1-2 mL of separated serum (if sample size is a problem the minimum acceptable is 100 µL).
The sample must be heat-treated before dispatch if HIV positive.
Samples may be sent by post.

Timing of samples
We recommend a pre dose sample taken immediately before administration.

Information required
Patient name, sex and age
Dosage and frequency and timing of samples
Clinical summary
Other medications (important)
Address for report
Phone (fax if preferred) number for report
Contact name
Appropriate hazard warnings

Other information
Samples sent by post must be sealed and packed to conform with current regulations.
Leaking samples may not be processed.

Target turn-round time
Results will be telephoned/faxed on the day of receipt for samples received between 9 am and 3 pm Monday to Friday only if advance warning was received.
A written confirmation report will be sent by post.