Laboratory Medicine

Laboratory medicine provides a comprehensive range of pathology services to the Trust, general practitioners and also to other external NHS and private sector organisations. It consists of clinical biochemistry, haematology, blood transfusion and immunology departments.

Contents: - click the links or scroll down the page

Key contacts

Results/General enquiries for all departments labresults@uhs.nhs.uk	**023 8120 6464**

Specific departmental contacts:

If dialling from outside SGH preface 4 digit numbers with 023 8120, unless full number is given

Clinical Biochemistry		
Helpline (24 hrs)		6427

Clinical advice e-mail	uhs.dutybiochemist@uhs.nhs.uk	
Clinical director	Dr Paul Cook	6419
Pathology Operations Director	Linda Sayburn	6435
Consultant & Deputy Clinical Lead for Biochemistry	Nicola Merrett	6434
Lab Medicine Operations Manager	Rick Allan	6706
POCT coordinator	Will Rivenberg	6721
Haematology and Blood Transfusion		
Haematology Laboratory		4029
Coagulation Laboratory		4823
Blood Transfusion Lab		4620
Phlebotomy Supervisor	Shamaila Tahsin	4821
Phlebotomy services SGH		4874
Clinical Lead	Dr M W Jenner	4438
Laboratory Lead	Dr M W Jenner	4438
Haematology Lab Director	Dr Seonaid Pye	3162
Consultants	Dr M W Jenner (Myeloma, Haematological Oncology, Blood and Marrow Transplantation)	4438
	Dr S Narayanan (Myeloma, Haematological Oncology, General Haematology)	4438
	Dr D S Richardson (Haematological Oncology, Blood and Marrow Transplantation)	6164
	Dr K H Orchard (Haematological Oncology, Blood and Marrow Transplantation)	4118
	Dr R S Kazmi (Haemostasis & Thrombosis, Blood Transfusion, General Haematology)	8862

	Dr Robert Lown	3556
	Dr Sara Boyce	3556
	Dr Tracy Burt (General Haematology)	5831
Wessex Immunology Service		
Immunology lab		6615
Flow Cytometry		6640
Immunology Clinic		4001
Consultant Immunologist	Dr Efrem Eren	6650 Mob: 07887812703
Consultant Immunologist	Dr Sapna Srivastava	5929
Consultant Clinical Scientist	Dr Alison Whitelegg	2043
Honorary Consultant	Prof A Williams	6670

About our services

Laboratory Medicine provides a comprehensive range of Pathology services to the Trust, General Practitioners and also to other external NHS and Private Sector organisations.

Consent

Please see the following document available on the UHS website: Consent to Examination or Treatment: Policy

Patients attending adult venesection services will be asked to give verbal consent prior to blood specimens being collected.

Information Governance

All staff working for the Pathology have a legal duty to keep information about patients and staff members confidential and to protect the privacy of individuals. All staff adhere to the Trust's Data Protection and Confidentiality Policy and are mandatorily required to perform annual Information Governance training.

Dealing with Complaints

Laboratory Medicine adheres to the Trust Policy for handling concerns and complaints. All complaints, either raised via Patient Support Services or directly to a member of staff from within the department will be thoroughly investigated and actioned to resolve any identified issues.

http://staffnet/TrustDocsMedia/DocsForAllStaff/GovernanceAndSafety/HandlingConcernsandComplaintsPolicy/HandlingConcernsandComplaintsPolicy.pdf

Availability of clinical advice

Consultants within each discipline are available to provide help with the interpretation of results and other clinical advice. Please refer to 'Key Contacts'.

Services offered

Clinical Biochemistry provides a full range of laboratory and clinical services incorporating routine biochemistry, lipids, toxicology and metabolism, endocrinology, trace metals and the co-ordination of clinical trial work and point-of-care testing. Renal stone, lipid and bone outpatient clinics are also undertaken.

Haematology and Blood Transfusion provide routine Haematology, Blood Transfusion and specialised haemostasis and haemoglobinopathy testing in support of regional and national programmes as well as services to support an expanding bone marrow transplant service. The department also supports a Haemophilia service for both adults and children. Consultant and nurse-led outpatient clinics are undertaken at SGH, RSH and Lymington Hospitals. Day care facilities are available on C3 Hamwic day ward at SGH and at Lymington Hospital. Palliative care is available through Countess Mountbatten House at Moorgreen Hospital.

Immunology provides routine immunological analysis into allergy, autoimmunity and protein chemistry as well as specialised analysis for the diagnosis of haematological malignancy and immunodeficiency.

Follow this link for Clinical Services Outpatient service details

Venesection service - see detail in Service hours (below)

Point of care testing. We can provide help and advice on the implementation of point of care testing system such as hand held blood glucose meters. Please contact our POCT coordinator for further information.

Service hours

Clinical Biochemistry, Haematology and Blood Transfusion laboratories 24-hour service

List of tests available 24 hours a day in Haematology and Coagulation

Haematology:
FBC
Retics
ESR
Glandular fever (IM) screen

Blood film
Malaria parasite screen
Sickle cell test
Coagulation:
Coagulation screen (CS)
INR
APTR
D-dimer
derived fibrinogen
Factor assays (with approval from Haematology consultant)
G6-PD screen
ADAMTS13

Specialist laboratories available Monday to Friday, 9am to 5pm

Clinical Biochemistry / Haematology

Immunology

Blood Tests - Service locations and hours (April 2011*)*

Phlebotomy services are available at Southampton General Hospital and Lymington Hospitals.

Details of times and venues are given below: -

Location	**Opening times**
SGH, C level, South Laboratory Block	Monday to Friday, 8am to 4.45pm -appointments can be booked via Ecamis,E-Referral & Netcall
SGH, children - Butterfly room, C level	Monday to Friday by appointment only, ext 4075
Lymington Hospital	Monday to Friday, 7.30 am to 3.15pm -appointments can be booked via Ecamis,E-Referral & Netcall
Romsey Hospital	Tuesday AM: 09.00-11.30 PM : 12.30-14.40pm Saturday 09.00-12.30pm-appointments can be booked via Ecamis,E-Referral & Netcall

Please note that appointments may be necessary for special procedures such as dynamic function tests

Completion of the request form

Request forms need to be properly completed. A request form must accompany all specimens sent to the laboratory and should clearly state the following information:

- Surname and forename
- Hospital /NHS Number
- Date of birth
- Sex
- Ward/Clinic and Consultant code
- Type of specimen
- Date and time of collection
- Investigations required
- Relevant clinical information
- Identification of priority status.

eQuest (electronic requesting) is the preferred method for the requesting of tests in Chemical Pathology, Haematology, Coagulation and Immunology as it leads to quicker processing times and reporting.

Specimen Collection

Samples should be collected into appropriate tubes and sent to the laboratory. Please allow tubes to fill to capacity. This is especially true of coagulation, where underfilled samples are unsuitable for testing and will be rejected.

The laboratories at SGH are open and able to receive samples 24 hours a day, 7 days a week.

Samples should be clearly labelled with the patient's name and date of birth. A request form that provides patient information, specimen type and tests required should accompany samples.

The requirements for samples for Blood Transfusion are more stringent, due to the prescription nature of the request. Both the sample and request should contain a minimum of the following information:

- Full name (no abbreviations)
- Hospital number and/or NHS Number
- Date of birth
- Date and time sample taken
- Signature of person taking blood

Failure to adhere to Blood Transfusion request guidelines WILL result in the rejection of the request, without exception.

A table of specimen requirements for commonly requested tests is provided below:

Test	**Anticoagulant**	**Adult tube top colour**
Routine Biochemical profile, lipids, etc.	Serum Separator Tube (SST) with Gel	Gold
Glucose	Fluoride Oxalate	Grey
HbA1c	EDTA	Mauve
FBC and ESR	EDTA	Mauve
Coagulation	Citrate	Sky Blue
Immunology investigations	Serum Separator Tube (SST) with Gel	Gold
Lithium	Serum Separator Tube (SST) with Gel	Gold
Group and Save/Crossmatch	EDTA	Pink
NT-Pro BNP	Lithium Heparin	Green
ACTH	EDTA	Mauve
PTH	Lithium Heparin	Green
HIT screen	Serum	Red

For all the above tubes, please ensure that the maximum fill is attained. Failure to do this may mean that the laboratories are unable to perform certain tests.

Please note that separate samples should be taken when requesting FBC/ESR and HbA1c, as they are performed in different areas and using the same sample may result in delays.

When using UHS electronic requesting system eQuest, it is imperative that the request-generated barcodes are of good quality (i.e. they are complete with a clear gap at either end), are attached to the correct sample and are attached straight, along the length of the tube, NOT around it. Failure to observe these instructions WILL lead to delays in processing and testing samples.

Special advice on sample collection

The information below is intended to provide advice on patient preparation and specimen collection for specific tests where results may be affected by these factors:

Faecal Immunochemical Testing (FIT)

Requesting source should contact the lab for FIT sampling kits and advice.

Glucose Tolerance Test

GTTs on Non-pregnant patients can be performed by the Venesectors in Pathology Outpatients. G.P.s who wish to use this service should send the patient, with a completed request form for a GTT to the Venesectors at Pathology Outpatients at 0845 on Monday, Tuesday, Wednesday and Friday morning. (Please note that Thursday is not possible due to large haematology clinics that morning.) Clinicians with hospital beds should arrange for their juniors to do the tests on the wards.

In pregnancy GTT's are carried out at Princess Anne Hospital in the antenatal Day Unit by special arrangement, telephone 023-8079-6303. These are generally requested by the Obstetrician at P.A.H.

The patient must have taken an unrestricted diet, including adequate carbohydrate, for at least 3 days prior to the test. The patient must be fasted for 10-16 hours before the test begins (plain water only allowed) and for the duration of the test. It is therefore convenient to commence the test first thing in the morning.

Trace Elements sample requirements

Urine samples

Random urine samples/plain 24-hour urine aliquots should be collected into Sterilin universal containers or other suitable trace element-free containers.

Whole blood samples

2mL Teklab lithium heparin tubes (paediatric samples)

Greiner sodium heparin for Trace Elements Analysis Vacuettes (adult samples)

External laboratories

If sending serum/plasma samples, whole blood samples should be collected as stated above, and then spun and separated into trace-element free polycarbonate tubes (these should not have rubber gaskets/O-rings in the lid as they are sources of contamination).

For any queries, please contact the Trace Elements laboratory: uhs.traceelements@uhs.nhs.uk

Sweat tests

Current Cystic Fibrosis unit sweat collection procedure

Sweat Test Process

- Identify patient
- Select forearm (avoid cuts)
- Cleanse skin with steret
- Wipe skin with sterile water & gauze
- Attach gel discs to each probe (only touch if wearing gloves)
- Apply red probe to lower arm and secure with straps
- Apply black probe to lower arm but higher than red probe
- Switch machine on
- Machine will beep when finished (after 5 mins)
- Remove black probe
- Remove red probe
- Throw both gel discs away
- Cleanse arm with sterile Water & Gauze
- Attach collection plate to area previously covered by the red probe
- Push down (should see blue dye appear to confirm working)
- Secure with straps
- Cover with bandage/cling film
- Leave for 30 minutes or until 3-4 clear blue rings seen in window
- Flip plastic cover off collection plate
- Pull plastic tubing out of collection plate and cut at base
- Use plunger to push sweat collected into collection pot
- Put small collection pot into specimen bottle & send to Trace Elements lab with specimen form.

N.B. We measure sweat chloride only in this laboratory.

Creatinine Clearance test

Collect a special urine collection bottle from the laboratory; this contains a small amount of thymol as a preservative.

Patient empties bladder; discard this urine and note the time on the bottle.

For the next 24 hours every drop of urine passed by the patient must be added to the bottle. Advise the patient to pass urine before opening their bowels if necessary.

24 hours later, empty bladder again and add to the collection, and note the time. The collection does not have to be exactly 24 hours, but we must know the exact times of starting and ending the collection (to the nearest minute).

At any time during the urine collection take a venous blood sample into a lithium heparin tube for plasma creatinine estimation.

Separate request cards must be written to accompany the urine sample and blood sample.

5-HIAA

For 24 hours prior to starting the using collection patients should refrain from eating or drinking any of the items listed below or any food or drink containing these items:

Broccoli, Cauliflower, Brussel Sprouts, Egg Plants, Mushrooms, Citrus Fruits and Tomatoes (including juices), Bananas, Avocados, Plums, Passionfruit, Pineapple, Alcohol (wine and beer), Processed meats (loaves, salami, sausages, ham), Fish, Seafood, Nuts, Seeds, Berries and Caffeine (including products containing chocolate).

Specimen rejection

Specimens will be rejected if they are unsuitable for the investigations requested or if the identity of the patient is in doubt. This is to prevent misleading results being reported that could lead to inappropriate patient management. The Laboratory Medicine specimen rejection policy contains full details and can be accessed using the link located in the downloads section of this web page.

High risk specimens and safety

All specimens must be collected into leak resistant containers. The container must be appropriate for the purpose, properly closed and not contaminated on the outside.

All specimens are regarded as high risk, but if they are taken from a patient who is known to be infected with a blood-borne agent such as hepatitis B virus and HIV, another serious infectious disease such as tuberculosis or typhoid, or from those at risk of being infected by one of these agents, then extra care should be taken to highlight this. These specimens should be labelled as HIGH RISK on the request form.

Specimen transport

All sample containers from a single request are to be sealed into a clear plastic specimen bag by the person taking the sample. Specimen request forms/support documents must not be placed in the same compartment as the sample.

UHS specimen transport arrangements:

Samples are collected from wards on a frequent basis by the portering service. However, using the pneumatic tube delivery (POD) system improves sample turnaround times and reduces pressure on portering staff. The system cannot be used for blood and blood products for transfusion, nor for Cellular Pathology samples that are immersed in liquid formalin fixative.

It should also not be used for: -

· Sputum samples
· CSF samples for xanthochromia (? SAH)

The system should be used for all other Pathology samples including blood cultures.
All samples for Laboratory Medicine should be sent to POD station number 8355

GP Practice specimen transport and collection arrangements:
Samples are collected from surgeries and clinics on a daily basis. For details of frequency and times please contact:

Transport Department
140 Mauretania Road
Nursling Industrial Estate
Southampton
SO16 6YS
Tel: 023 80748027

Adding Additional Investigations

Immunology:
Cell based assays only viable for 48 hours.
Serological tests - please note that requests for retrospective testing can be made up to **ONE** month **ONLY** after the sample has been taken, subject to the sample volume remaining being sufficient and also the nature of the retrospective request

Clinical Biochemistry:
Specialist Biochemistry, Endocrinology investigations: 3 weeks
Automated investigations: 24 hours
Trace Element: 1 Month
Urine drug screen - one month
Chromatography investigations: 1 month

Blood Transfusion:
Depends on 'sample validity '. A sample is valid for 7 days when stored at 4C as long as the patient has not been transfused in the last month. If patient has been transfused in last month, the sample is only valid for 72 hours from when the transfusion started or must not be more than 72 hours old when transfusion begins. Kleihaur can be added up to 7-days.

Coagulation:

Test to be added	Time limit
INR, CS, DD, Lupus Anticoagulant	12 hours
APTR	4 hours
Thrombophilia screen	Not possible to add
Factor assays, Protein C/S, Antithrombin, Thrombin Time, Von Willebrand antigen, Collagen Binding assay, Ricof,	1 hour after venesection
Platelet aggregation, PFA 100, Thromboelastogram, Any other specialist coagulation test	Not possible to add

Automated Haematology:

Test to be added	Time limit
FBC, IM (glandular fever) screen, Haemoglobinopathy screen, Sickle cell screen,	1 day
Film, ESR, Reticulocyte, nucleated RBC	1 day
Malaria parasite screen, G-6-PD screen	Needed fresh

If the required investigation is not listed above, please contact the relevant laboratory

Results Reporting

- Validated results are reported electronically to UHS results servers eQuest and ICE.
- Electronic reports are produced for GP sources every 2 hours 05:00-22:00 for delivery via EDI PMIP services.
- Hard copy reports for valid locations are printed and dispatched every working day, including Saturdays.

Telephoning of significant results

Samples may be "fast tracked" and results telephoned back when necessary. Results for these samples will normally be available within 2 hours of receipt in the laboratory. Please call ext. 8890 and provide patient's details so that the sample may be identified.

Occasionally unexpected abnormal results are produced. If this occurs, laboratory staff will endeavour to telephone these results to the requesting source.

Useful clinical information

Common causes of spurious results

Please ensure that you follow instructions when collecting and storing samples. Inappropriate sample collection, storage and transport can interfere with a number of results. Same examples are given in the table below:

Problem	Common causes	Effect
Incorrect tube fill/mixing		ALL analytes may be compromised
Delay in separation of plasma	overnight storage delay in transit	Increased K, PO4, LDH
Storage	Biochemistry samples in a fridge	Increased K
Haemolysis	Expelling blood through a needle into the tube Vigorous shaking Extremes of temperature	Increased K, PO4, ALT, LDH, Mg, Iron
Inappropriate collection site	Sample taken from drip arm	Increased drip analyte e.g. K , Glucose Dilution effect low results
Incorrect container or anticoagulant	No fluoride oxalate	Decreased glucose
	E.D.T.A. contamination	Decreased Ca Increased K
	Li sample collected into Li Heparin	Increased Li

Hormone profiles

PROBLEM	APPROPRIATE REQUESTS
MALE PATIENTS	
Erectile dysfunction	LH FSH Prolactin Testosterone (08.00-10.00H)
Infertility	LH FSH Prolactin Testosterone (08.00-10.00H)
Gynaecomastia/ galactorrhoea	LH FSH Prolactin HCG Testosterone (08.00-10.00H) Oestradiol; thyroid function tests (LFT's & renal profile)
FEMALE PATIENTS	
? Menopause	For women <50 years LH FSH (days 2 to 4 of cycle)
{?PCO; hirsutism;virilisation;alopecia	Free testosterone index (FTI; ref 0.6- 6.1%), this will include testosterone and SHBG.
Amenorrhoea/oligomenorrhoea	HCG (?pregnant) LH FSH Prolactin; Free testosterone index (FTI), this will include testosrone and SHBG. oestradiol; thyroid function tests
Infertility	(1) days 2 to 4 of cycle: LH FSH Free testosterone index (this will include testosterone and SHBG) thyroid function (2) day 21:progesterone (if 4wk cycle; if not: 21/28 x length of cycle in days)
Galactorrhoea	Thyroid function tests. HCG (?pregnant) prolactin

Testing for diabetes mellitus

The laboratory provides a comprehensive service for diagnosis and monitoring of patients with diabetes mellitus, including plasma glucose, haemoglobin A1c and urinary microalbumin testing.

Diabetes Mellitus in the presence of symptoms can be diagnosed by:-

1) A random plasma glucose concentration > 11.1 mmol/L or

2) A fasting plasma glucose concentration > 7.0 mmol/L or

3) A 2-hour glucose post 75g oral GTT of > 11.1 mmol/L

A GTT should not be necessary if the fasting plasma glucose is > 7.0 mmol/L, but this needs to be confirmed on another occasion if the patient has no symptoms. Patients with impaired fasting glycaemia ("IFG") (fasting plasma glucose > 6.1 but less than 7.0 mmol/L) should be assessed with an oral GTT.

Impaired glucose tolerance ("IGT") is defined as a fasting plasma glucose of <7.0 mmol/L and a 2-hour plasma glucose during an OGTT of > 7.8 but < 11.1 mmol/L. Patients with IGT should have an annual check of their fasting blood glucose. Note: fasting should be taken to mean 12 hours (plain water only allowed).

Thyroid function testing

Our strategy is to measure TSH and FT4 together as first-line tests. "TSH/FT4" or "TFT's" should be requested. Please do not request FT3 on routine thyroid requests. FT3 is unhelpful for ?hypothyroidism, and will be added by the laboratory if required for the investigation of borderline hyperthyroidism, T3 toxicosis or possible over-replacement with thyroxine.

Problems with potassium

Abnormal plasma potassium results are a recurring problem with samples from General Practice.
Sometimes the results are spurious—often explained by delays in separating plasma from cells; sometimes by extremes of temperature during transport. We now have insulated collecting boxes and are addressing transport issues.
Sometimes the results are significantly abnormal, requiring action.
Unless clearly spurious, we telephone potassium results if:

2.5 mmol /L or below (new finding)
2.0 mmol/l or below (if previous levels low)
6.0 mmol/L or higher (new finding);
6.5 mmol/L or higher (if previous levels raised)

High plasma potassium > 5 mmol/L

Possible causes (rare genetic causes excluded)

Spurious
1. Haemolysed samples
2. Delay in separating plasma from cells - the ideal is within 1 hour of venepuncture. Values after 6 hours are unacceptable
3. Samples refrigerated at 4 C
4. Unusually cold weather - potassium leaks into plasma during transport
5. Collection into inappropriate tubes (e.g. fluoride tubes used for glucose; potassium EDTA tubes for blood counts)
6. Vigorous mixing

7. Patients open and close their fist repeatedly during venesection

8. Very high white cell counts: > 2000 x 109/L (leukaemias)

9. Very high platelet counts: > 1000 x 109/L

10. Abnormally permeability of red cells: cold agglutinins; infectious mononucleosis; inherited red cell membrane defect (rare)

True hyperkalaemia

Normal kidneys excrete excess potassium promptly - within hours. Hyperkalaemia generally occurs with renal failure plus another factor. Life-threatening hyperkalaemia is almost always encountered in those with impaired renal function.

Drugs

1. Potassium supplements

2. Potassium sparing diuretics - triamterene; amiloride; spironolactone

3. Drugs that interfere with the renin/aldosterone axis:

a. ACE inhibitors—e.g. captopril; enalapril

b. ACE 11 receptor blockers- e.g. losartan; candesartan

c. nonsteroidal anti-inflammatory drugs

d. heparin; tacrolimus; cyclosporin; trimethoprim-sulphamethoxazole

e. Drugs that inhibit membrane ATPase -digoxin; β-Blockers

Combinations of the above are particularly risky

Diet

1. Potassium-containing salt substitutes (low salt)

2. High potassium foods if end-stage renal failure

Acute renal failure:

Especially if catabolic—sepsis; injury; intravascular haemolysis; GIT bleed

Chronic renal failure:

If no other exacerbating factors potassium may be maintained until GFR <10 ml/min

Disorders of renin-aldosterone

tubulo-interstitial renal disease - may see in diabetics

Addison's disease

Diabetic ketoacidosis

There is electrical instability of cardiac and skeletal muscle

Risk: life-threatening cardiac arrhythmias

Typically: no recognisable symptoms before cardiac arrest

Sometimes: non-cardiac symptoms (potassium generally >7.5 mmol/l)

:muscle weakness; paraesthesiae; rarely: flaccid paralysis

Risk increases with rising potassium but there is not close correlation

- patients with chronic renal failure may be more resistant

ECG abnormalities are the best guide to risk

plasma potassium (mmol/L):
rough correlation

[1] 6.5-7.0 Peaked T waves
[2] 7.0-8.0 Prolonged P-R interval; flattening then loss of P waves; Widening of QRS complexes with deep S waves
[3] >8.0 Sine wave pattern progressing to ventricular fibrillation then cardiac arrest
[4] >10.0 Generally fatal

Can progress rapidly from [1] to [3], particularly if plasma sodium or ionised calcium is low

Hyperkalaemia with peaked T waves is serious
Hyperkalaemia with more advanced ECG changes is life-threatening

Low plasma potassium <3.5 mmol/L

Possible causes

Spurious — sample artefacts
1. Very high white cell count (leukaemias)
2. Unusually warm weather

True hypokalaemia (rare endocrine and genetic causes excluded)
1. With normal or low blood pressure

Diuretics
1. loop diuretics (frusemide, bumetamide, torasemide etc); thiazides; acetazolamide.
2. Beware surreptitious use by slimmers

Diet
1. Vomiting: including bulimia / surreptitious vomiting
2. Diarrhoea: including intestinal fistulas; laxative abuse (complaint will be constipation)
3. Anorexia
4. Alcohol abuse – chronic; bingeing; alcoholic ketoacidosis
5. Magnesium deficiency
6. Early response to Vitamin B12 treatment in pernicious anaemia

Renal
1. Renal tubular acidosis

Drugs
1. carbenicillin
2. amphoteracin B

3. theophylline
4. cisplatin

Other causes

1. Hypertensive patients on diuretics
2. Excess mineralocorticoids
3. Conn's syndrome
4. renovascular hypertension
5. Cushing's Syndrome

Clinical significance

The ratio of intracellular to extracellular potassium is critical for nerve and muscle function. Even with severe depletion, plasma potassium is often well maintained (3.0 – 3.5 mmol/L).

Symptoms

Mild hypokalaemia: 3.0 – 3.5 mmol/L – does not usually cause symptoms. Found in around 20% of hospital patients

Moderate: 2.5 – 3.0 mmol/L – may cause:
lack of energy
weakness
constipation

Severe: <2.5 mmol/L – symptoms are likely, particularly if the fall in potassium is rapid

neuromuscular: muscle weakness and fatigue – can progress to paralysis
paralytic ileus
rhabdomyolysis

If chronic: polyuria / polydipsia
metabolic alkalosis

ECG abnormalities may be seen at <3.0 mmol/L
(Flattened T waves; depressed S-T segment; prominent U waves)

They indicate low plasma potassium
They are usually only serious clinically (risk of life-threatening arrhythmias) if:
· there is myocardial ischaemia or other cardiac pathology
· on digoxin

Otherwise, arrhythmias are unlikely at plasma concentrations >3.0 mmol/L

Potassium supplements or potassium sparing drugs are advised with diuretics if:

· pre-treatment potassium is 3.0 – 3.2 mmol/L

· potassium falls to 3.0 – 3.2 mmol/L after 4 weeks on diuretics

· the patient has a potassium-losing disorder (e.g. cirrhosis, nephrotic syndrome; chronic diarrhoea)

Replacement of a serious body deficit takes a long time.

Quality Assurance

All Pathology departments have a mature quality management system, as described in the Pathology quality manual.

The following departments are UKAS accredited medical laboratories:

Department of Haematology & Blood Transfusion.

UKAS accreditation number: 8149

Department of Clinical Biochemistry

UKAS reference number:8483

Department of Immunology

UKAS reference number: 8696

(The UKAS ISO15189 schedule of accreditation are detailed on the UKAS website https://www.ukas.com/find-an-organisation/

Please refer to the attached document G3.7a laboratory medicine investigations for the accreditation status of individual tests

We are accredited for training Biomedical Scientists and Clinical Scientists by the Health Care Professions Council (HCPC).