

Manchester University NHS Foundation Trust - Division of Laboratory Medicine			
Document title	Information for referring laboratories (cross-site)	Q-Pulse identifier	BC-Q-33
Department	Clinical Biochemistry cross-site	Revision number	1
Author	N Halpin	Copy number	Electronic
Authorised by	L Parke, M Miller, J Adaway	Page number	1 of 21

Wythenshawe

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Dear Colleague,

Details of accreditation can be found on the UKAS website:

<https://www.ukas.com/download-schedule/9063/Medical/>

Please find additional information below:

Re: ISO 15189 Clause 4.5 - Examination by referral laboratories

The Biochemistry Laboratory carries out a wide variety of analyses, details of which can be found in the table below. The UKAS accreditation number for covering cross-site is 9063 (accreditation was combined from 1st April 2023) - please check the UKAS website for the full schedule of accreditation.

Please note that each request received and accepted by Manchester Foundation Trust Biochemistry Department from external laboratories for examination(s) shall be considered as an agreement. In accordance with ISO 15189 requirements, we will inform our external users of:

- Any changes in sample requirements
- Any issues which may have caused a result or the interpretation of a result to be unreliable
- Any changes which may significantly affect turnaround times
- Poor EQA performance that affects the validity of patient results
- Any changes in accreditation status
- Any changes in contact details.

If you require any further information, please contact the laboratory using the contact details above.

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Assay	Sample type	Minimum sample volume	Transport requirements (where it is possible to send sample for analysis)	EQA scheme+	Method	Turnaround time*	Comments
7-alpha-hydroxy-4-cholesten-3-one	Serum	100 uL	1st class post (Wyth)	Regular recovery experiments	LC-MS/MS	14 days	Early morning fasted sample. Falsely low in liver dysfunction, falsely elevated in non-fasted samples. Please ensure serum separated from cells within 12 hours of collection and aliquotted into fresh tube before sending.
17-hydroxy progesterone	Serum or lithium/heparin plasma	150 uL (250 uL if part of female androgen profile)	1 st class post (ORC, Wyth)	UK NEQAS	LC-MS/MS	240 hours	Part of female androgen profile Note for paed: Neonatal samples should not be taken in the first 48hrs of life
17 α OH Progesterone (blood spot)	Blood spot	N/A	1st class post (ORC)	CDC NBSQAP & RfB	LC-MS/MS	1 month	3 blood spots collected throughout the day
5HIAA (urine)+	24 hour acid urine+	10 mL aliquot from 24 hour urine	1 st class post (Wyth)	UK NEQAS	LC-MS/MS	240 hours	pH must be ≤4. Please state 24-

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							hour urine volume on form
5HIAA (serum)	Serum	100 µL	1 st class post (Wyth)	Regular recovery experiments carried out	LC-MS/MS	240 hours	
Alkaline Phosphatase Isoenzymes	Serum or lithium/heparin plasma	1 mL	1 st class post (ORC)	UK NEQAS	Electrophoresis	3 weeks	This test is not required if the total alkaline phosphatase activity is not raised.
Amikacin	Serum or lithium/heparin plasma	1 mL adults, 100 µL paed	1 st class post (ORC, Wyth)	UK NEQAS	Roche Cobas KIMS	Urgent 2 hours, routine 4 hours	Pre-dose. Please include dosing details & regimen.
ACE	Serum	200 µL	1 st class post (Wyth)	UK NEQAS	Kinetic enzyme assay	72 hours	
Alpha-1 antitrypsin	Serum	100 µL	1 st class post (ORC, Wyth)	UK NEQAS	Turbidimetry	96 hours	

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Aldosterone and renin	EDTA plasma preferred (Lithium heparin plasma also acceptable)	400 µL	Transport frozen (Wyth; adults and paed)	UK NEQAS (aldosterone) UK NEQAS pilot (Renin) RIQAS (renin)	LC-MS/MS	240 hours	Samples stable for 24 hours pre-centrifugation at room temperature. Store frozen once plasma separated. Requests for aldosterone or renin will receive both results.
Antimullerian Hormone	Serum or lithium/heparin plasma	150 uL	1 st class post (ORC)	UK NEQAS	Immunoassay	Same day	
Androstenedione	Serum	150 uL (250 uL if part of female androgen profile)	1 st class post (ORC, Wyth)	UK NEQAS	LC-MS/MS	240 hours	Part of female androgen profile
Androgens (female)	Serum	250 µL	1 st class post (ORC, Wyth)	UK NEQAS	LC-MS/MS	240 hours	Includes testosterone, androstenedione, 17-OHP, DHEA-S and SHBG.
Anti-hypertensive screen	Random plain urine	0.5 mL	Transport frozen (ORC)	LGC (pilot)	LC-MS/MS	4 weeks	Freeze at -20°C upon receipt.

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Beta-hydroxybutyrate	Serum or lithium/heparin plasma	100 µL plasma/serum (1.2mL paediatric lithium heparin tube sufficient for BHB & FFA, should be a separate tube for these tests i.e. not on child profile sample)	Transport frozen (ORC)	UK NEQAS	Enzymatic	2 weeks	Must be received on ice at referring [your] laboratory, plasma separated & frozen within 20mins.
Breath hydrogen	Samples collected by lab staff	N/A	N/A (ORC)	N/A	Gas Chromatography	Same week as appointment	Referrals by clinician/specialist nurses should be sent to laboratory to arrange an appointment.
Busulfan	Serum	1 mL	Transport frozen by courier (ORC)	Sample exchange	LC-MS/MS	Same day	Only required in specific oncology patients by arrangement (contact duty biochemist). Samples must be received at the referring [your] laboratory, serum separated and

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							frozen within 30mins of collection.
C-peptide	Serum or lithium/heparin plasma	100 uL	Transport frozen (ORC)	UK NEQAS	Mercodia	2 weeks	Must be received at referring [your] laboratory, serum/plasma separated and frozen within 2.5hrs of collection.
CA-125	Serum	1 mL	1 st class post (ORC, Wyth)	UK NEQAS	Immunoassay	Same day	
Caeruloplasmin	Serum or lithium/heparin plasma	1 mL	1 st class post (ORC)	UK NEQAS	Turbidimetry	1 week	
Carbamazepine	Serum or lithium/heparin plasma	100 uL	1 st class post (ORC, Wyth)	LGC	Roche Cobas KIMS	Urgent 2 hours	
Catecholamines (Urine)+	24 hour collection (acid containing bottle) or random urine sample+	10 mL	1 st class post (ORC)	UK NEQAS	HPLC	1 week urgent: by discussion with duty biochemist	Must be sent promptly to referring lab for acidification to pH <3.

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Cobalt	Whole blood EDTA	1 mL	1 st class post (ORC)	UK NEQAS	ICP-MS	4 weeks	For monitoring metal on metal joint replacement.
Copper	Serum	1 mL	1 st class post (ORC)	UK NEQAS	ICP-MS	1 week	
Copper (urine)+	24 hour collection+	1 mL	1 st class post (ORC)	UK NEQAS	ICP-MS	4 weeks	
Cortisol (saliva)	Saliva	250 µL	1 st class post (Wyth)	Sample exchange (UK NEQAS) Standards and IQC made from independent reference material	LC-MS/MS	240 hours	Also includes cortisone
Cortisol (serum)	Serum	50 µL	1 st class post (Wyth)	UK NEQAS	LC-MS/MS (immunoassay also available ORC, Wyth)	36 hours	
Cortisol (urine)+	24 hour urine (plain)+	5 mL aliquot from 24 hour urine	1 st class post (Wyth)	UK NEQAS	LC-MS/MS	192 hours	Please state 24 hour urine volume on form

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Cortisone (saliva)	Saliva	250 µL	1 st class post (Wyth)	Sample exchange (UK NEQAS) Standards and IQC made from independent reference material	LC-MS/MS		Also includes cortisol
CTX	Plasma EDTA	0.5 mL	Transport frozen (ORC)	RCPA QAP, Rfb, Sample exchange	IDS iSYS	1 week	Separate and freeze as soon as possible after collection. Fasting samples preferable.
Cyclosporin	EDTA whole blood	100 µL	1 st class post (ORC, Wyth. Weekends and BH Wyth only)	UK NEQAS	LC-MS/MS	24 hours	12 hours post dose – state dose and timings.
Cystatin-C	Serum or lithium/heparin plasma	100 µL	1 st class post (ORC)	UKNEQAS & EQUALIS	Immunoassay/turbidimetry	Urgent 2 hours, routine 4 hours	CKD-EPT cystatin c will be calculated for adults
Dexamethasone	Serum	250 µL	1 st class post (Wyth)	UK NEQAS & Regular recovery	LC-MS/MS	360 hours	

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				experiments carried out			
DHEA-S	Serum	150 uL (250 uL if part of female androgen profile)	1 st class post (ORC, Wyth)	UK NEQAS	LC-MS/MS	240 hours	Part of female androgen profile
Digoxin	Serum or lithium/heparin plasma	100 µL	1 st class post (ORC, Wyth)	UK NEQAS	Competitive immunoassay	Urgent 2 hours, routine 4 hours	Pre-dose or 12 hours post dose
Disaccharidases**	Jejunal mucosa biopsy**	1 mg	Transport frozen (ORC)	None available	Fluorimetric	3 weeks	Wrap biopsy in silver foil, place in 2ml screwcap tube, place on ice immediately*
Everolimus	EDTA blood	100 µL	1 st class post (Wyth)	LGC	LC-MS/MS	24 hours	
Faecal calprotectin	Faeces	Pea size sample 5 g	Transport frozen (ORC)	UK NEQAS	ELIZA	2 weeks	Sample should be sent promptly to referring [your] laboratory and frozen on receipt. Samples collected while the patient has diarrhoea may give falsely low results.

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Faecal elastase	Faeces	Pea sized sample	1 st class post (Wyth)	UK NEQAS	ELISA	336 hours	
Free fatty acids (FFA)	Serum or lithium/heparin plasma	200 uL	Transport frozen (ORC)	RIQAS	ACS-ACOD-MEHA	2 weeks	Must be received on frozen ice and separated within 20 minutes of collection
FT3	Serum	150 µL (250 if TSH and fT4 also required)	1 st class post (ORC, Wyth)	UK NEQAS	Competitive immunoassay	72 hours	
Gentamycin	Serum or lithium/heparin plasma	1 mL adults, 100 µL paed	1 st class post (ORC, Wyth)	UK NEQAS	CEDIA	Urgent 2 hours, routine 4 hours	Pre-dose. Please include dosing details & regimen.
Growth hormone	Serum	0.5 mL	1 st class post (ORC)	UK NEQAS	IDS-iSYS	2 weeks	
Insulin	Serum or lithium/heparin plasma	0.5 mL	1 st class post (ORC)	UK NEQAS	Mercodia	2 weeks	Must be received at referring [your] laboratory, serum/plasma separated and frozen within 2.5hrs of collection.
Insulin Like Growth Factor 1 (IGF-1)	Serum	0.5 mL	1 st class post	UK NEQAS	IDS iSYS	2 weeks	

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			(ORC)				
Isavuconazole	serum (non gel tube only)	25 uL	Transport (1st class post(Wyth)	UK NEQAS and LGC	LC-MS/MS	96 hours	
Itraconazole	Serum	25 µL	1 st class post (Wyth)	UK NEQAS	LC-MS/MS	96 hours	
IGF-binding protein 3	Serum or lithium/heparin plasma	150 uL	1 st class post (ORC)	UK NEQAS	IDS iSYS	3 weeks	
Lactate (CSF)	Fluoride oxalate/Fluoride EDTA	0.5 mL	1 st class post (ORC, Wyth)	UK NEQAS	Lactate Oxidase	Urgent 2 hours, routine 4 hours	
Methotrexate	Serum or lithium/heparin plasma	1 mL	1 st class post (ORC)	UK NEQAS	ARK	Mon-Fri (9am-5pm) same day. Weekends & out of hours next day Urgent: by arrangement	
Metanephrines (metanephrine, normetanephrine & 3-methoxytyramine)	EDTA plasma	250 µL	Transport frozen (Wyth)	RPCA QAP & UK NEQAS pilot)	LC-MS/MS	240 hours	Samples must be separated and frozen within 1 hour of collection.
Mycophenolic acid	EDTA plasma – MUST be	100 µL	1 st class post (Wyth)	LCG	LC-MS/MS	192 hours	

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Assay	Sample type	Minimum sample volume	Transport requirements (where it is possible to send sample for analysis)	EQA scheme+	Method	Turnaround time*	Comments
	separated prior to sending.						
NT pro-BNP	Serum or lithium/heparin plasma	300 uL	1st class post (ORC)	UK NEQAS	Immunoassay	Urgent 2 hours, routine 4 hours	
Oestradiol	Serum	50 µL for immunoassay. Ideally 300 µL for LC/MS	1 st class post (Wyth for LC-MS/MS)	UK NEQAS	CMIA or LC-MS/MS (immunoassay also available ORC, Wyth)	24 hours for immunoassay. 8 days for LC-MS/MS.	Please state on the request form which oestradiol method you require.
Orosomuroid (alpha-1-acid glycoprotein)	Serum or lithium/heparin plasma	1 mL	1 st class post (ORC)	UK NEQAS	Turbidimetry	Same day	
Prednisolone	Serum	100 µL	1 st class post (Wyth)	No suitable scheme available. Regular recovery experiments carried out	LC-MS/MS	192 hours	
Phenobarbitone	Serum or lithium/heparin plasma	1 mL	1 st class post (ORC)	LGC	Roche Cobas KIMS	Urgent 2 hours, routine 4 hours	Pre-dose

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Phenytoin	Serum or lithium/heparin plasma	100 uL	1 st class post (ORC, Wyth)	LGC	Roche Cobas KIMS	Urgent 2 hours, routine 4 hours	Pre-dose
Posaconazole	Serum	25 µL	1 st class post (Wyth)	UK NEQAS	LC-MS/MS	96 hours	
P1NP (Procollagen type 1 N-terminal propeptide)	Serum or lithium/heparin plasma	0.5 mL	1 st class post (ORC)	UK NEQAS	IDS-iSYS	2 weeks	Low P1NP - decreased collagen formation Elevated P1NP - increased collagen formation

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Assay	Sample type	Minimum sample volume	Transport requirements (where it is possible to send sample for analysis)	EQA scheme+	Method	Turnaround time*	Comments
P3NP (Procollagen type 1 N-terminal propeptide)	Serum	0.5 mL	<p>Long distance: Transport frozen</p> <p>Within UK: 1st class post.</p> <p>(ORC)</p>	UK NEQAS	RIA	4 weeks	<p>Serum P3NP levels in children may reflect both hepatic fibrinogenesis and also general growth.</p> <p>Consider biopsy in psoriatics on Methotrexate if Pre-treatment >8.0ug/L or three samples > 4.2ug/L in twelve month period or two samples > 8.0ug/L consecutively.</p> <p>Consider withdrawing Methotrexate if three samples > 10.0ug/L in a twelve month period. Active erosive arthritis or fractures may raise P3NP.</p>

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Procalcitonin	Serum or lithium/heparin plasma	1 mL	Transport frozen if sending through post (ORC, Wyth)	RIQAS	Immunoassay	Same day	
Reducing Substances and sugar chromatography (faeces)	Random faecal collection	5 g	Transport frozen (ORC)	None available	Thin Layer Chromatography (TLC)	2 weeks	Sample must be frozen within 2 hours of collection.
Renal calculus analysis	Calculus	NA	1 st class post (Wyth)	WEQAS	Reflectance spectrometry	192 hours	
Selenium	Serum	1 mL	1 st class post (ORC)	UK NEQAS	ICP-MS	2 weeks	
SHBG	Serum	100 µL for SHBG alone. 300 if part of female androgen profile.	1 st class post (ORC, Wyth)	UK NEQAS	Sandwich immunoassay	240 hours	Included in female androgen profile.
Sirolimus	EDTA whole blood	100 uL	1 st class post (ORC, Wyth. Weekends and BH Wyth only)	UK NEQAS	LC-MS/MS	24 hours	12 hours post dose – state dose and timings.

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Assay	Sample type	Minimum sample volume	Transport requirements (where it is possible to send sample for analysis)	EQA scheme+	Method	Turnaround time*	Comments
Sweat test	Samples collected by lab staff	N/A	N/A	UK NEQAS	ICP-MS	Same week as patient appointment	Referrals by clinician/specialist nurses should be sent to laboratory to arrange an appointment.
Tacrolimus (FK506) **for mitra contact Wyth	EDTA whole blood	100 µL	1 st class post (ORC, Wyth. Weekends and BH Wyth only)	UK NEQAS	LC-MS/MS	24 hours	12 hours post dose – state dose and timings.
Teicoplanin	Serum	150 µL	1 st class post (Wyth)	LGC	LC-MS/MS	120 hours	
Testosterone (MS)	Serum	150 µL (250 µL if part of female androgen profile)	1 st class post (ORC, Wyth)	UK NEQAS	LC-MS/MS	2 weeks	
Testosterone (male)	Serum	150 µL	1 st class post (ORC, Wyth)	UK NEQAS	Immunoassay	240 hours	
Testosterone (saliva)	Saliva – passive drool only	500 µL	1 st class post (Wyth)	Standards and IQC made from independent reference material	LC-MS/MS	1 month	Samples collected onto salivette swabs are unsuitable.

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Tobramycin	Serum	1 mL adults, 100 μ L paed	1 st class post (ORC, Wyth)	UK NEQAS	Homogeneous enzyme immunoassay	4 hours	
Thiopental	Serum or lithium/heparin plasma	200 μ L	1 st class post (ORC)	None available	HPLC	By arrangement only – contact duty biochemist	Must be informed if patient is also taking carbamazepine
Theophylline	Serum or lithium/heparin plasma	100 μ L	1st class post (ORC, Wyth)	LGC	Roche Cobas KIMS	Urgent 2 hours, routine 4 hours	
Thyroid function tests (TSH and fT4)	Serum	250 μ L (300 μ L if fT3 also required)	1 st class post (ORC, Wyth)	UK NEQAS	Immunoassay	4 hours	
Thyroid peroxidase autoantibodies	Serum	100 μ L	1 st class post (ORC, Wyth)	UK NEQAS	Competitive immunoassay	96 hours	
Thiopurine MethylTransferase (TPMT)	Whole blood EDTA	1 mL	1st class post (ORC)	Sample exchange	HPLC	10 days	Recent blood transfusion may mask deficient TPMT result. Reflex requesting of genotype for low activity.

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Urine citrate+	24 hour acid urine+	10 mL aliquot of 24 hour urine	1 st class post (Wyth, paed for referral)	WEQAS	LC-MS/MS	240 hours	pH must be ≤2. Please state 24 hour urine volume on form.
Urine cotinine	Random urine	100 uL	1 st class post (Wyth)	LGC	LC-MS/MS	192 hours	
Urine cystine+	24 hour plain urine+	10 mL aliquot of 24 hour urine	1 st class post (Wyth)	No suitable scheme available. Regular recovery experiments carried out	LC-MS/MS	240 hours	Please state 24 hour urine volume on form
Urine oxalate+	24 hour acid urine+	10 mL aliquot of 24 hour urine	1 st class post (Wyth, paed referral)	WEQAS	LC-MS/MS	240 hours	Please state 24 hour urine volume if applicable. pH must be <2.
Vitamin A (retinol)	Serum or lithium/heparin plasma	1 mL	1 st class post. Protected from light. (ORC)	UK NEQAS	HPLC	2 weeks	Protect from light
Vitamin D (25OH-D3/D2 & Total)	Serum	1 mL	1 st class post (ORC, Wyth)	DEQAS & UK NEQAS	LC-MS/MS	1 week	

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1,25-dihydroxyVitamin D (Vitamin D metabolite)	Serum	1 mL	1st class post (ORC)	DEQAS	LC-MS/MS	4 weeks	
Vitamin E (Tocopherol)	Serum or lithium/heparin plasma	1 mL	1 st class post. Protected from light. (ORC)	UK NEQAS	HPLC	2 weeks	Protect from light
Valproate	Serum or lithium/heparin plasma	1 mL	1 st class post (ORC)	LGC	EIA	Urgent 2 hours, routine 4 hours	Pre-dose
Vancomycin	Serum or lithium/heparin plasma	1 mL adults, 100 uL paed	1 st class post (ORC, Wyth)	UK NEQAS	Roche Cobas KIMS	Urgent 2 hours, routine 4 hours	Pre-dose. Please include dosing details & regimen.
Voriconazole	Serum	25 µL	1 st class post (Wyth)	UK NEQAS	LC-MS/MS	96 hours	
Zinc	Serum	1 mL	1 st class post (ORC)	UK NEQAS	ICP-MS	1 week	

*Turnaround time is from time of receipt to result being available on our LIMS system. Turnaround time applies to a normal working week – there may be a delay during Bank Holiday periods. If you wish to enquire about setting up an NPEX link with our lab to facilitate transfer of results, please email: nick.rolls@mft.nhs.uk (Wythenshawe) and adam.tonge@mft.nhs.uk (ORC)

Manchester University NHS Foundation Trust - Division of Laboratory Medicine			
Document title	Information for referring laboratories (cross-site)	Q-Pulse identifier	BC-Q-33
Department	Clinical Biochemistry cross-site	Revision number	1
Author	N Halpin	Copy number	Electronic
Authorised by	L Parke, M Miller, J Adaway	Page number	21 of 21

**For Jejunal Biopsy Disaccharidases please send directly to:
Specialist Biochemistry,
Second floor, CSB3
Manchester University NHS Foundation Trust
Oxford Road
Manchester
M13 9WL
Contact details: 0161 701 8891

+Please note: 24-hour urine volumes MUST be detailed on the request form or transferred electronically via NPEX.

Further information can be found on our website: <https://mft.nhs.uk/the-trust/other-departments/laboratory-medicine/biochemistry/>

If you refer a test to our department that doesn't appear in the table above, please do not hesitate in getting in contact.

Yours faithfully,

Michelle Miller

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