



Interpreting common investigations in GP practice

**Aneela Tehseen
Clinical Pharmacist**

Objectives

- Understand relevant investigations for LTC
- Understand the role of investigation relevant to determine management of LTC
- Understand significance of abnormalities in relation to a known diagnosis



Learning Objectives

Common Long-Term Conditions

- Diabetes
- Heart failure
- TIA/ Stroke
- Chronic kidney disease
- Asthma
- COPD
- Dementia
- Hypercholesterolaemia
- Hypertension



Common Long-Term Conditions: Continued

- Atrial fibrillation
- BPH
- GORD
- IBD
- Glaucoma
- Most MH disorders
- Epilepsy
- Hypertension
- Hypothyroidism



How do I know if blood test investigations are essential for a given LTC and why?

- Disease process
- How will it impact body?
- What happens if patient's condition deteriorates/ gets better?
- It may be the medicine that needs monitoring rather than the disease



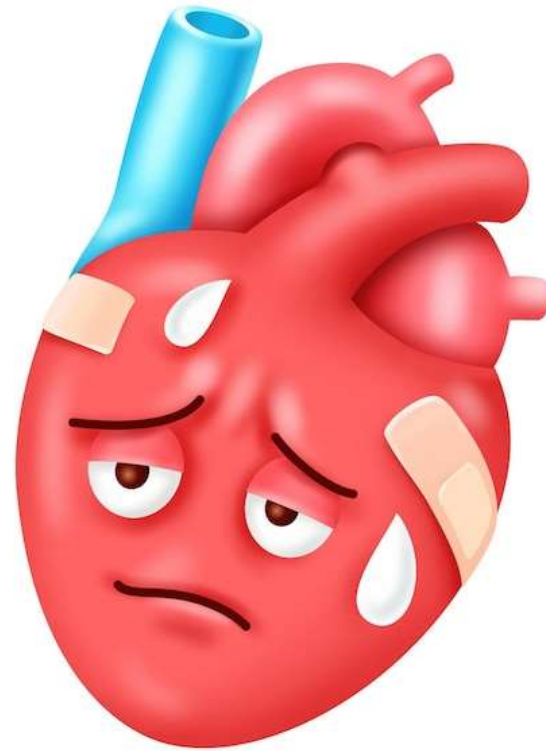
Diabetes

- HbA1C
- BP
- Renal function
- Urine ACR
- Lipids
- TFT
 - B12
 - Folate
 - FBC



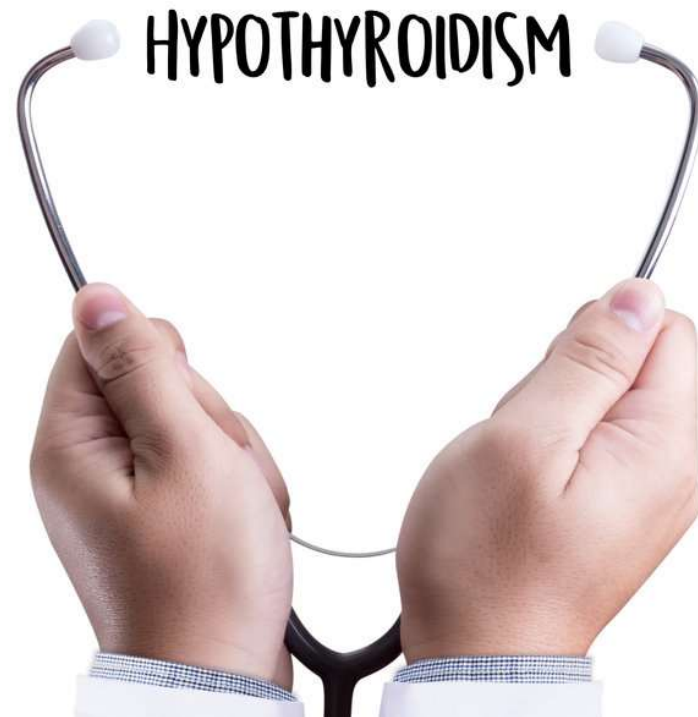
Heart failure

- NT pro-BNP
- FBC
- UnE
- LFT
- HbA1C
- TFT
- Lipids



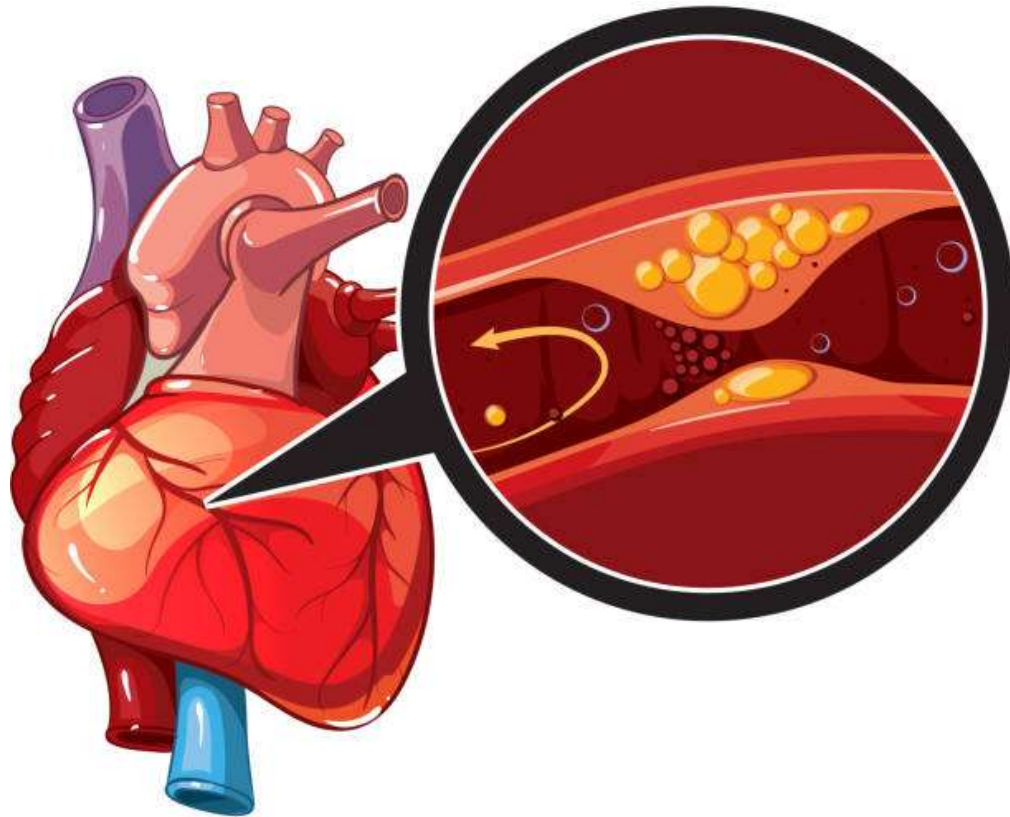
Hypothyroidism

- TFT (TSH, Free T4)
- HbA1C
- Lipids
- Haematinics
- FBC



IHD

- Lipids
- BP



Hypercholesterolaemia

- Lipids
- TFT
- LFT



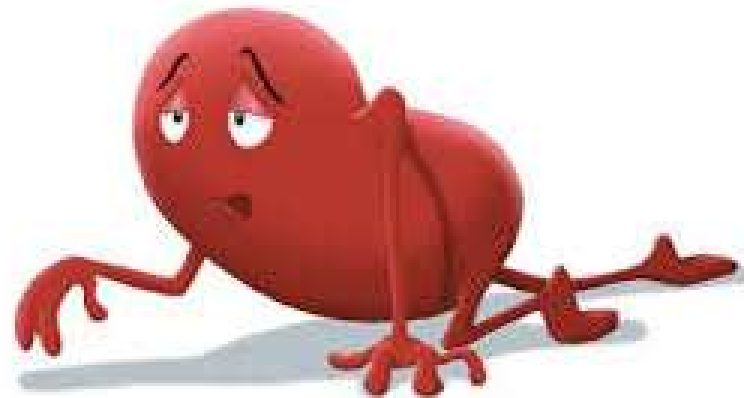
Hypertension

- UnE, eGFR
- Urine ACR
- HbA1C
- Lipids



Chronic Kidney Disease

- UnEs
- eGFR
- Estimated Creatinine Clearance
- LFT
- Serum Phosphate
- PTH
- Dyslipidaemia
- FBC



Haematinics

- Iron
- Vitamin B12
- Folic acid



Anemia



Normal level

Iron

Anaemia blood profile with low iron:

- Low Hb
- Low MCV
- Low serum Ferritin
- Low transferrin saturation
- High Total iron binding capacity

Anaemia of chronic disease: Low Hb with normal or high Ferritin

Iron deficiency without anaemia: Normal Hb and low Ferritin



Iron (continued)

- Normochromic normocytic anaemia
 - Hb/cell is normal + RBC size is normal
- Normochromic microcytic anaemia
 - Hb/cell is normal + RBC size is small
- Hypochromic microcytic anaemia
 - Hb/cell is low + RBC size is small
- Hyperchromic macrocytic anaemia
 - Hb/cell is high + RBC size is high



Folate and B12

- Deficiencies and anaemia
- B12 levels that should be concerning
- Folate levels that should be concerning
- Treating deficiencies



Shall we check our understanding
using real case scenarios

Deranged LFT

Hepatic steatosis/cirrhosis

Blood test on 15/7/23

Hb 179, MCV 71, PLT 250, Na 139, K 4.5, Creatinine 75, eGFR >90, ALT 118, Bilirubin 11, ALP 96, Tg 2.4, Alb 43, Normal haematinics, AST 155, GGT 611, **Vitamin D 9.5**



Deranged LFT continued



Blood test on 15/7/23

Hb 179, MCV 71, PLT 250, Na 139, K 4.5, Creatinine 75, eGFR >90, ALT 118, Bilirubin 11, ALP 96, Tg 2.4, Alb 43, Normal haematinics, AST 155, GGT 611, Vitamin D 9.5

Renal profile case study

Sample 23ORC-012OA02639 (Blood) Collected 12 Jan 2023 12:16 Received 12 Jan 2023 20:26

UREA AND ELECTROLYTES (U&E)

SODIUM		141	mmol/L	133 - 146
POTASSIUM	*	3.2	mmol/L	3.5 - 5.3
UREA (BIOCHEM)	*	11.8	mmol/L	2.5 - 7.8
CREATININE	*	87	umol/L	45 - 84
EGFR		60	mL/min/1.73m ²	

Following NICE guidance (NG203) issued August 2021 there is no longer
a recommendation to adjust for ethnicity for CKD-EPI EGFR.

Renal profile case study (continued)

Sample 23ORC-039OA03325 (Blood) Collected 08 Feb 2023 13:42 Received 08 Feb 2023 19:54

UREA AND ELECTROLYTES (U&E)

SODIUM		139	mmol/L	133 - 146
POTASSIUM		5.1	mmol/L	3.5 - 5.3
UREA (BIOCHEM)	*	19.9	mmol/L	2.5 - 7.8
CREATININE	*	128	umol/L	45 - 84
EGFR		38	mL/min/1.73m ²	

Following NICE guidance (NG203) issued August 2021 there is no longer a recommendation to adjust for ethnicity for CKD-EPI EGFR.

Renal profile case study (continued)

Sample 23ORC-0730A03317 (Blood) Collected 14 Mar 2023 20:17 Received 14 Mar 2023 20:17

UREA AND ELECTROLYTES (U&E)

SODIUM		137	mmol/L	133 - 146
POTASSIUM		4.3	mmol/L	3.5 - 5.3
UREA (BIOCHEM)	*	15.6	mmol/L	2.5 - 7.8
CREATININE	*	90	umol/L	45 - 84
EGFR		58	mL/min/1.73m*2	

Following NICE guidance (NG203) issued August 2021 there is no longer
a recommendation to adjust for ethnicity for CKD-EPI EGFR.

Renal profile case study (continued)

Sample 23ORC-138OA03063 (Blood) Collected 18 May 2023 13:12 Received 18 May 2023 17:27

UREA AND ELECTROLYTES (U&E)

SODIUM		142	mmol/L	133 - 146
POTASSIUM		4.2	mmol/L	3.5 - 5.3
UREA (BIOCHEM)	*	13.7	mmol/L	2.5 - 7.8
CREATININE	*	95	umol/L	45 - 84
EGFR		54	mL/min/1.73m ²	

Following NICE guidance (NG203) issued August 2021 there is no longer
a recommendation to adjust for ethnicity for CKD-EPI EGFR.

Anaemia case study

Full blood count - FBC		(DRSAMI) - Abonrmal but stable: Satisfactory	
AUTO WBC	5.9 10 ⁹ /L (4.0 - 11.0)		
Red blood cell (RBC) count	3.84 10 ¹² /L (4.50 - 6.00)		
Haemoglobin estimation	121.0 g/L (130.0 - 180.0)		
Haematocrit	0.388 L/L (0.400 - 0.520)		
Mean corpuscular volume (MCV)	101.0 fL (80.0 - 98.0)		
Mean corpusc. haemoglobin(MCH)	31.5 pg (27.0 - 33.0)		
Mean corpusc. Hb. conc. (MCHC)	312 g/L (320 - 365)		
Platelet count	498 10 ⁹ /L (150 - 400)		
Red blood cell distribut width	13 % (11 - 15)		
Neutrophil count	3.23 10 ⁹ /L (1.80 - 7.50)		
Lymphocyte count	2.12 10 ⁹ /L (1.00 - 4.00)		
MONOCYTES ABSOLUTE	0.49 10 ⁹ /L (0.20 - 1.00)		
Eosinophil count	0.04 10 ⁹ /L (0.00 - 0.40)		
Basophil count	0.04 10 ⁹ /L (0.00 - 0.10)		
IMMATURE GRANULOCYTES #	0.02 10 ⁹ /L (0.00 - 2.00)		
Nucleated red blood cell count	0.00 10 ⁹ /L		
Pulse rate	70 beats/min		

Anaemia case study

(continued)

Detailed View			»
! Haemoglobin estimation			
All data (22)			
29-Aug-2023	121.0 g/L	Haemoglobin esti...	^
24-Aug-2023	112.0 g/L	Haemoglobin esti...	
16-Mar-2023	117.0 g/L	Haemoglobin esti...	
13-Jul-2022	123 g/L	Haemoglobin esti...	
17-Nov-2021	125 g/L	Haemoglobin esti...	
13-May-2021	126 g/L	Haemoglobin esti...	
03-Jun-2020	121 g/L	Haemoglobin esti...	
21-Aug-2019	117 g/L	Haemoglobin esti...	
12-Aug-2019	111 g/L	Haemoglobin esti...	
07-Aug-2019	Clotted	Haemoglobin esti...	
23-Apr-2018	131 g/L	Haemoglobin esti...	
17-Jan-2018	136 g/L	Haemoglobin esti...	
06-Nov-2017	112 g/L	Haemoglobin esti...	
01-Nov-2017	Clotted	Haemoglobin esti...	v
Trend			

Anaemia case study

(continued)

! Mean corpuscular volume (MCV)		
☐ All data (22)		
29-Aug-2023	101.0 fL	Mean corpuscular v...
24-Aug-2023	96.9 fL	Mean corpuscular v...
16-Mar-2023	101.7 fL	Mean corpuscular v...
13-Jul-2022	102 fL	Mean corpuscular v...
17-Nov-2021	95 fL	Mean corpuscular v...
13-May-2021	98 fL	Mean corpuscular v...
03-Jun-2020	97 fL	Mean corpuscular v...
21-Aug-2019	99 fL	Mean corpuscular v...
12-Aug-2019	101 fL	Mean corpuscular v...
07-Aug-2019	Clotted	Mean corpuscular v...
23-Apr-2018	79 fL	Mean corpuscular v...
17-Jan-2018	79 fL	Mean corpuscular v...
06-Nov-2017	86 fL	Mean corpuscular v...

Anaemia case study

(continued)

! Serum vitamin B12		
□ All data (9)		
25-Sep-2023	1055 ng/L	Serum vitamin B12
17-Nov-2021	184 ng/L	Serum vitamin B12
03-Jun-2020	194 ng/L	Serum vitamin B12
21-Aug-2019	262 ng/L	Serum vitamin B12
23-Apr-2018	237 ng/L	Serum vitamin B12
01-Nov-2017	261 ng/L	Serum vitamin B12
21-Aug-2014	425 ng/L	Serum vitamin B12
10-Mar-2014	474 ng/L	B12
09-Jul-2013	456 ng/L	B12

CKD case study

Sample 23ORC-3110A03701 (Blood) Collected 07 Nov 2023 13:59 Received 07 Nov 2023 16:48

FULL RENAL PROFILE

SODIUM		137	mmol/L	133 - 146
POTASSIUM	*	5.8	mmol/L	3.5 - 5.3
UREA (BIOCHEM)	*	26.9	mmol/L	2.5 - 7.8
CREATININE	*	1090	umol/L	59 - 104
BICARBONATE	*	21	mmol/L	22 - 29
EGFR		4	mL/min/1.73m ²	

Following NICE guidance (NG203) issued August 2021 there is no longer

CKD case study (continued)

Sample 23ORC-311OA03701 (Blood) Collected 07 Nov 2023 13:59 Received 07 Nov 2023

FERRITIN

FERRITIN	*	530	ug/L	15 - 400
----------	---	-----	------	----------

CKD case study (continued)

TRIGLYCERIDES

TRIGLYCERIDES	*	4.8	mmol/L	0.0 - 1.6
---------------	---	-----	--------	-----------

Sample very lipaemic; Triglycerides measured

CKD case study (continued)

Sample 23ORC-248OA04301 (Blood) Collected 05 Sep 2023 15:02 Received 05 Sep

PARATHYROID HORMONE (PTH) (LAB ONLY)

PARATHYROID HORMONE	*	71.1	pmol/L	1.6 - 6.9
---------------------	---	------	--------	-----------

CKD case study (continued)

Sample 23ORC-311HC02471 (Blood) Collected 07 Nov 2023 13:59 Received 07 Nov 2023 16:

FULL BLOOD COUNT

AUTO WBC		6.6	$10^9/L$	4.0 - 11.0
RBC	*	3.35	$10^{12}/L$	4.50 - 6.00
HAEMOGLOBIN	*	110.0	g/L	130.0 - 180.0

Please note change to FBC Critical Ranges from 2/10/2023

HAEMATOCRIT	*	0.315	L/L	0.400 - 0.520
-------------	---	-------	-----	---------------

Please note change to FBC Critical Ranges from 2/10/2023

MCV		94.00	fL	80.00 - 98.00
-----	--	-------	----	---------------

Please note change to FBC Critical Ranges from 2/10/2023

MCH		32.8	pg	27.0 - 33.0
MCHC		349	g/L	320 - 365
PLATELETS		221.0	$10^9/L$	150.0 - 400.0

Please note change to FBC Critical Ranges from 2/10/2023

RDW	*	17	%	11 - 15
NEUTROPHILS ABSOLUTE		3.59	$10^9/L$	1.80 - 7.50

CKD case study (continued)

CALCIUM	*	2.15	mmol/L	2.20 - 2.60
ALBUMIN (BIOCHEM)	*	34	g/L	35 - 50
ADJUSTED CALCIUM		2.23	mmol/L	2.20 - 2.60
ALKALINE PHOSPHATASE (ALP)		110	U/L	30 - 130
PHOSPHATE	*	1.98	mmol/L	0.80 - 1.50





CONTACT INFO



+44 207 692 8709



www.belmatt.co.uk



admin@belmatt.co.uk
info@belmatt.co.uk



Suite 570, 405 Kings Road
Chelsea
SW10 0BB