One Gloucestershire
Transforming Care, Transforming Communities

Pathology education
GP Registrar training
25th March 2020

Welcome and introductions

- Elizabeth Burgess FRCPath - Principal Clinical Biochemist, (Gloucestershire Hospitals NHS Foundation Trust)
- Dr Tamsin Griffith – GP at Cotswold Medical Practice
- Zoë Riley – Commissioning Manager (Gloucestershire Clinical Commissioning Group)

Background

- In 2013, the Pathology dept. within Gloucestershire Hospitals NHS Foundation Trust (GHNHSFT) invited clinical and managerial colleagues from the Primary Care Trust (now Clinical Commissioning Group) to be part of a **Pathology User Forum**
  - This group still meets quarterly and is open to users of GHNHSFT Pathology services e.g. GPs, Community providers, Out of Hours etc.
  - The group ensures issues can be identified early and addressed collaboratively. It has also helped build strong relationships between the pathology team and it's users / commissioners.
  - It has recently started to feed into the ICS Diagnostic Board.

Background

- The **Pathology Optimisation Group** (a working group of the Pathology User Forum) was established in 2017, with a view to:
  - Build on existing relationships formed already within the Pathology User Group
  - Undertake more detailed work to help adopt the aims and recommendations made by NHS Scotland :
    - Minimise over and under requesting
    - Reduce unnecessary repeat requesting
    - Ensure appropriate and useful test collections available
    - Standardisation to reduce unnecessary variation
- The group is made up of clinical colleagues from GHNHSFT pathology service, GPs and Commissioners.

Background

- Work undertake by the Pathology Optimisation Group to date includes:
  - Updated ICE Test collection panels
  - RAG rating of 'cost factors' for the key Chemical Pathology and Haematology tests requested by GPs.
    - *The cost factor for each test was calculated using the cost of processing an individual test combined with the total volume of each type of test processed by the laboratory so that a more realistic comparison was available.*
  - Collation and distribution of pathology variation data for primary care (at Practice level)
    - Support to individual practices also provided upon request should GP level data be required
  - Input into development of clinical pathways for G-Care e.g. Tired all the Time and B12

ICE Test Collections

- To support primary care colleagues with their pathology requesting, from 1st May 2018, new test collections were made available on the front page of ICE Requesting.
  - Existing test collections were reviewed and updated in line with the work of Devon Primary Care around pathology variation and the Gloucestershire Pathology Optimisation Group. New test collections were also created and others that were no longer relevant were removed.
- The profiles cover condition/disease monitoring, new diagnosis/referral, and medication monitoring for a range of conditions and medications. Where appropriate, panels match the testing requested in referral and treatment pathways published on G-care.
- All tests in each profile will be default requested upon selection of the test panel within ICE.

ICE Test Collections: example of the profiles available

New Diagnosis / Referral Profiles	Monitoring Profiles	Medication
☐ CVD (New Diagnosis)	☐ Bariatric Surgery: Bypass or DS (Annual)	☐ Amiodarone
☐ Dementia Screen (New Diagnosis)	☐ Bariatric Surgery: Sleeve Gast (Annual)	☐ Azathioprine
☐ Diabetic Screen (New Diagnosis)	☐ CKD Stage 3b and above (Annual)	☐ Lithium - 3 month test
☐ Early Inflammatory Arthritis	☐ CVD Annual (CHD, PVD, TIA and CVA)	☐ Lithium - 12 month test
☐ Health Check	☐ Gastric Band (Annual)	☐ Methotrexate (Stable Disease)
☐ Hypertension (New Diagnosis)	☐ Hypertension (Annual)	☐ Methotrexate (Symptomatic Disease)
☐ Menorrhagia	☐ Mental Health (Annual)	☐ Sulphasalazine
☐ Myeloma / MGUS Screen	☐ Obesity (Annual)	
☐ Palpitations	☐ Type 1 Diabetes (Annual Review)	
☐ RACP Clinic	☐ Type 2 Diabetes (6 Month Interim Review)	
☐ Subfertility Investigations Female	☐ Type 2 Diabetes (Annual Review)	
☐ Suspected New Heart Failure		
☐ Tired All The Time (1 Month)		
☐ Tired All The Time (3 Months)		

ICE Test Collections

An example of an **amended test collection** is show below for the new diagnosis of CVD: CHD, PVD, TIA and CVA *(always refer to ICE panels for most up to date clinical information)*

PROFILE NAME	NEW / UPDATED TEST COLLECTION		PREVIOUS TEST COLLECTION	
CVD: CHD, PVD, TIA and CVA (New Diagnosis)	UEG	Electrolytes + Creatinine + eGFR	UEG	Electrolytes + Creatinine+ eGFR
	RLP	Cholesterol Test (non-fasting)	RLP	Cholesterol Test (non-fasting)
	LV	Liver Function Tests (LFT)	LV	Liver Function Tests (LFT)
	F	FBC	F	FBC
	HBA1CD	HbA1c (diagnosis)	GLF	Fasting Plasma Glucose
			GLR	Random Plasma Glucose
			BN	Bone Profile (inc. calcium)
			FLP	Fasting Lipid Profile
			TSH	TSH – Thyroid Function Test

ICE Test Collections: future work

- The Pathology Optimisation Group plan to review the current ICE panels to ensure they are still clinically appropriate, amending where necessary in line with local or national guidance
- Suggestions for further test collections to be added can be made by clinical colleagues
- Variation work will continue to identify areas of high and low levels of testing which can then inform the creation of new ICE panels in the future

What's the harm?

- Fran's Story: NHS Northern, Eastern and Western Devon Clinical Commissioning Group (2015)
  - Fran discusses the negative impact an unnecessary blood test had on her.

https://youtu.be/Bf0aPxYLjEQ

- Commonly held belief "*There's no harm in adding on a couple more blood tests if a patient is going to have a blood test anyway*"
- **BUT we should consider the symptoms and the patient too**
- *"We were almost treating the test result rather than Fran as a person"*

There's no such thing as a 'standard' patient: what is the impact of unnecessary testing?

Below we have summarised some real life experiences encountered as clinicians and caregivers within Gloucestershire

Case Study #1

Background:

- GP requested a number of blood tests for a patient that they were starting on statins

- One of these tests was a renal function test, which isn't clinically indicated; result for this test then came back as abnormal

Consequences

- Patient anxiety; concerns around potential renal failure when patient was without any symptoms in first place
- Out of hours GP appointment was needed to manage abnormal result; further blood tests then required

There's no such thing as a 'standard' patient: what is the impact of unnecessary testing?

Case Study #2

Background:

- Toddler being reviewed by Consultant paediatrician due to concerns around gross motor development and muscle weakness. No other concerns.
- Bloods then taken for a wide range of tests; liver function, calcium, phosphate, glucose, thyroid function, Vitamin D as well as a genetic test. Blood taken when child was under general anaesthetic having an unrelated minor operation
- A false positive result for the phosphate test was returned
- After other test results obtained, parents were informed that the expectation was then that the genetic result would also then be normal

Consequences

- The false positive result for the phosphate test then led to a 21 month old child requiring an unnecessary x-ray the day after their surgery to check on bone strength / development as well as an attendance at the Paediatric Day Unit where further bloods were taken. A clean catch urine test was also required at the same time.

There's no such thing as a 'standard' patient: what is the impact of unnecessary testing?

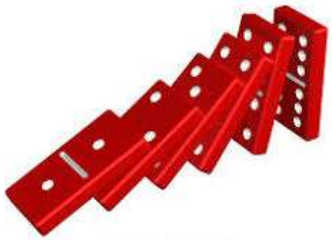
Case Study #2 (continued)

Consequences (continued)

- After obtaining both samples, parents were called upon returning home to be told the urine sample had been labelled with another patients name and therefore both bloods and urine had to then be repeated at a later date
- Genetic test results were shared with parents via a letter posted shortly before the Consultant then went on leave; results showed 'a duplication on child's X chromosome' and both the lab and paediatrician stated they were 'uncertain as to the significance' of this result
- Both parents then underwent a blood test, genetic test and family had an appointment with a geneticist from tertiary hospital; results showed it was inherited from mother who was otherwise fine and therefore the result was considered to be of no relevance
- Huge anxiety for parents in terms of overall health of child and future children, subjecting child to further blood tests and trying to obtain a clean catch urine sample in toddler that wasn't yet toilet trained.

There's no such thing as a 'standard' patient: what is the impact of unnecessary testing?

- Both of these stories show the cost to the NHS and the patient in terms of unnecessary testing and the chain of events that can unfold as a consequence
- Consideration should be given to:
  - Is this test really necessary?
  - What do you expect the test result to show and will the result change your clinical management?
  - Have you shared your reason for testing with the patient? Do they understand what is being tested and why?
  - How will you communicate results to patients / caregivers?
  - Think through potential consequences of abnormal results in terms of the patient and the healthcare system
  - If in doubt;
    - Seek advice from clinical colleagues
    - Check G-Care
    - Check ICE panels (where available)
    - Check available web resources



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Pathology variation work

- In 2017 work began to provide information to primary care around their rates of pathology requests
- Work inspired and influenced by:
  - Keele benchmarking data
  - Northern Devon Primary Care and NHS Scotland pathology optimisation work
  - Local clinical expertise from both primary care and the pathology labs

Pathology variation work

- Quarterly pathology testing data was shared with each practice at specialty level e.g. Chemical Pathology, Haematology, Microbiology and Immunology.
- Information was then also shared on:
  - CRP / V / ESR
  - B12
  - LFTs
  - Tumour Markers
- The Practices were given their data on a ‘per 1000 registered patient’ basis. To allow comparisons to be made, this data was shown within the context of the CCG average and the average for their taxonomy group
- Data shows ‘test profile’ activity. For example an LFT request may comprise 5 individual tests or an HbA1c request would just be 1 test but in most cases it would be the test profile that a GP requests

Pathology variation work

Example of information shared and what it revealed:

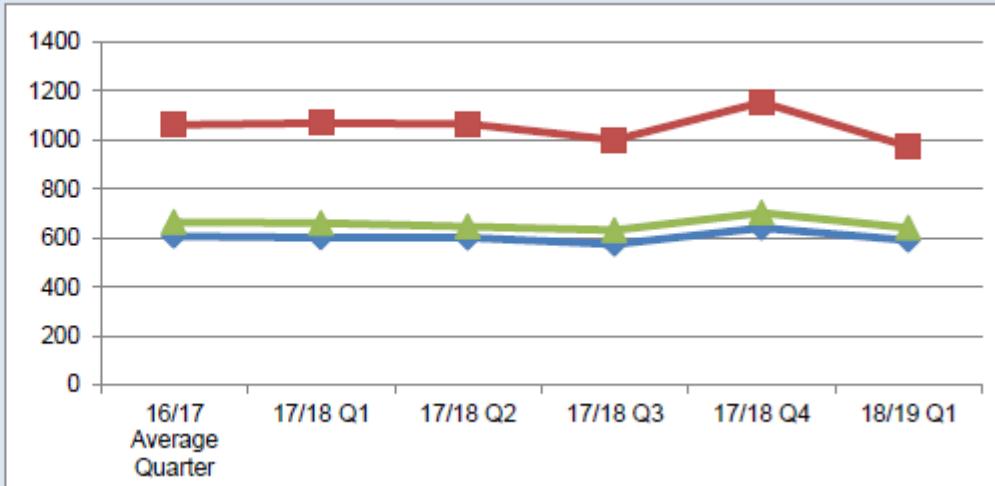
Key:

Red – Practice activity

Green – Taxonomy group average

Blue – CCG average

Chemical Pathology



Pathology variation work – Key messages for Primary Care

Use of inflammatory markers

"Clinicians are uncertain about the appropriate use of inflammatory markers and differ in their approach to testing patients with undifferentiated symptoms. Normal or significantly elevated inflammatory markers are seen as helpful, but mildly raised inflammatory markers in the context of non-specific symptoms are difficult to interpret. Clinicians describe a tension between not wanting to 'miss anything' and, on the other hand, being wary of picking up borderline abnormalities that can lead to cascades of further tests. Diagnostic uncertainty is a common reason for inflammatory marker testing, with the aim to reassure; however, paradoxically, inconclusive results can generate a cycle of uncertainty and anxiety"

Watson J, de Salis I, Hamilton W,et al.'I'm fishing really' — Inflammatory marker testing in primary care: a qualitative study. Br J Gen Pract2016

Pathology variation work – Key messages for Primary Care

CRP / V / ESR

These markers of inflammation are only **very rarely required in combination**.

CRP is generally used to monitor the **progress of bacterial infectious disease** although it will be increased in many conditions causing inflammation.

Viscosity will generally be used to **assess disease activity in some inflammatory disorders.**

ESR is reserved for **specific patient pathways and will not be assayed routinely. If it is requested please do not also ask for Viscosity and CRP.**

The new ICE requesting panels will aid in test choice.

For more information visit www.labtestsonline.org.uk or https://www.gloshospitals.nhs.uk/our-services/services-we-offer/pathology/.

Pathology variation work – Key messages for Primary Care

Plasma Viscosity vs ESR: **Clinical** aspects compared

CLINICAL ASPECTS	
Plasma Viscosity	**ESR**
Normal range the same for both sexes	Normal range different for both sexes
Unaffected by physiological stimuli (except in pregnancy)	Influenced by age and haematocrit (Red cell concentration)
Increased result due to change in protein concentration (mainly fibrinogen and/or globulins)	No exact cause can be stated for increase in ESR (Changes in Red cell shape/concentration and protein changes)
Abnormal results detected earlier	Abnormal results detected later

Pathology variation work – Key messages for Primary Care

Plasma Viscosity vs ESR: **Clinical** aspects compared

CLINICAL ASPECTS	
Plasma Viscosity	**ESR**
Low incidence of false negative results	High incidence of false negative results
Serial tests in an individual responding to therapy would show a fall in PV on a continuous curve	ESR results show irregular peaks and troughs without clinical explanation
High dose steroids do not normalise the PV. (Inflammation must be reduced)	High dose steroids will return ESR to normal. (Underlying disease may not be improved)

Pathology variation work – Key messages for Primary Care

Plasma Viscosity vs ESR: **Clinical** aspects compared

CLINICAL ASPECTS	
Plasma Viscosity	**ESR**
Salicylates have no effect on PV	Salicylates can lower the ESR result without improving the underlying condition of the patient
Polycythaemia does not interfere with Measurements	Haematocrit >50% will produce a normal ESR irrespective of the underlying disease
Results in myeloma and macroglobulinaemia are characteristic and can be diagnostic	ESR cannot distinguish between protein abnormalities and inflammatory conditions

Pathology variation work – Key messages for Primary Care

Plasma Viscosity vs ESR: **Technical** aspects compared

TECHNICAL ASPECTS	
Plasma Viscosity	**ESR**
Unaffected by time-induced deterioration and can be analysed up to 1 week post sampling	Must be analysed within 4 hours of sampling unless EDTA sample, which has a 24 hour time limit
Unaffected by anaemia	Affected by anaemia
Variations in red cell size and shape have no effect	Red cell size and shape variations affect the rate of sedimentation

Pathology variation work – Key messages for Primary Care

Plasma Viscosity vs ESR: **Technical** aspects compared

TECHNICAL ASPECTS	
Plasma Viscosity	**ESR**
All results are universally comparable. Calibration using fully traceable, CE marked reagents	Results not universally comparable due to different anticoagulants, tubes and timing methods.
External Independent Quality Control is available (Central Quality Assurance Scheme QEH. Birmingham UK.)	No Independent Quality Control possible.
Time factor: from receipt of sample, centrifugation and testing takes 10 minutes if lab is notified in advance	Time factor: from receipt of sample, setting up and reading of result takes 65 minutes

Pathology variation work – How has it helped?

Pathology variation work – How reflecting on the data can lead to real changes in behaviour.

Example 1: GP Registrar audit on Inflammatory Markers

An audit was undertaken within a GP Practice looking at individual requests for ESR, CRP and V as well as requests for these inflammatory markers in combination with one another.

They initially looked at data on an individual GP basis between Oct-Dec 2018 as well as comparing the practice with all others in Gloucestershire. Data showed variation between the number of multiple requests for inflammatory markers between each GP and between practices.

This data was reviewed by the practice and data analysis was repeated for Oct-Dec 2019, which showed:

- 196 fewer 'combination' tests than the same time last year
- Decrease in all combinations of inflammatory markers being checked
- Increase in single inflammatory markers being checked each time a time
- Overall reduction in tests requested with associated reduction in overall cost

Pathology variation work – How reflecting on the data can lead to real changes in behaviour.

Example 2:Changing practices in primary care

Several GP Practices used the data we shared to start discussions with their colleagues. Conversations were focused on the whole pathway in question.

The data shared with them prompted them to jointly agree whether there were ways that they were able to reduce the number of requests they made as individuals and as a practice.

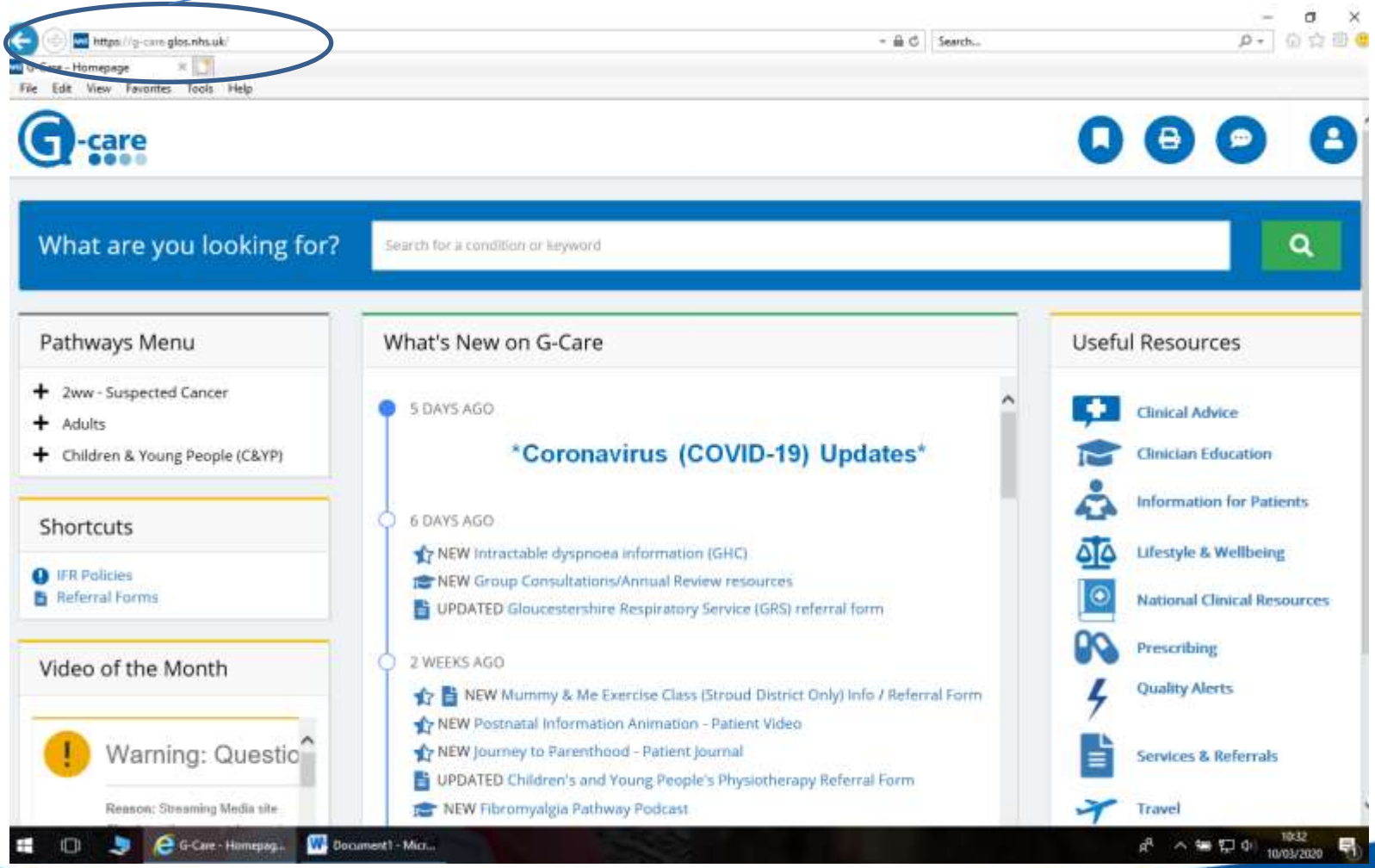
It also led to some practices looking beyond the data in terms of how they then communicated with their patients once the result comes back

“The data you sent out was very useful”

“Already made changes to our 'routine' testing”

G-Care

https://g-care.glos.nhs.uk/



Tired all the Time (TATT)

- https://g-care.glos.nhs.uk/pathway/659/resource/11
- As part of work stream to optimise the use of Pathology various areas of testing were reviewed with the aim of improving quality and consistency
- One of these areas was unexplained fatigue, commonly known as ‘Tired All The Time (TATT)’.
  - Fatigue is normal for many people; between 10–18% of people in the UK report having tiredness lasting 1 month or longer and 1.5% of people consult their GP with a new symptom of tiredness each year.
  - Tiredness may be due to psychological, psychosocial, physical, or physiological causes or a combination of these.
-

Tired all the Time (TATT)

- 5-7% of GP consults present for fatigue
  - 75% of presentations are isolated episodes caused by life events or lifestyle requiring no follow up, with **less than 3% of cases being caused by diseases such as anaemia or hypothyroidism.**

- Blood tests are often ordered immediately for TATT patients and although tests may exclude diagnosis and reassure the patient, they have a **low rate of identifying any underlying disease**.
- More serious causes need to be excluded through **history, examination and consultation skills** e.g. looking for red flags, is it a first presentation in an older patient etc.?
  - Don't forget to consider mental health, sleep disorders, alcohol and medication causes too as well as asking about their ideas and concerns.

Tired all the Time (TATT)

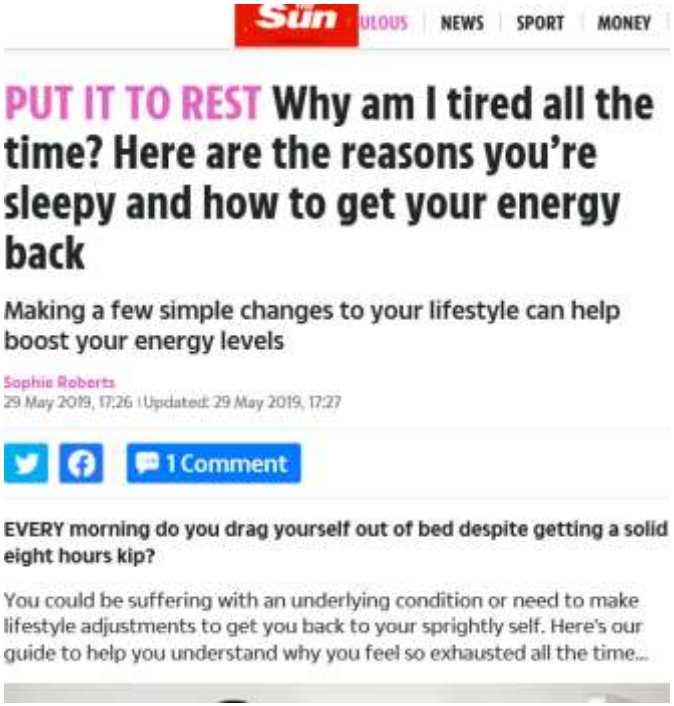
VAMPIRE TRIAL

- Trials such as the VAgue Medical Problems In REsearch (VAMPIRE) trial found that **only 17% of patients had symptoms 4 weeks later.**
  - Initial postponement of blood test ordering may be a sound alternative (providing there are no red flags).
- GPs need to balance up:
  - the yield of immediate, expanded test ordering with the risk of false-positive test results
  - VS
  - the diagnostic delay in the relatively few diagnoses when postponing blood-test ordering, considering that the majority of patients do not revisit their GP for their complaints within 4 weeks.

Tired all the Time (TATT)

Article in ‘The Sun’ offers helpful insight;

https://www.thesun.co.uk/fabulous/3941518/why-always-tired-sleep-deprivation-energy-reasons/



The Sun FABULOUS | NEWS | SPORT | MONEY

PUT IT TO REST Why am I tired all the time? Here are the reasons you’re sleepy and how to get your energy back

Making a few simple changes to your lifestyle can help boost your energy levels

Sophie Roberts
29 May 2019, 17:26 | Updated: 29 May 2019, 17:27

1 Comment

EVERY morning do you drag yourself out of bed despite getting a solid eight hours kip?

You could be suffering with an underlying condition or need to make lifestyle adjustments to get you back to your sprightly self. Here’s our guide to help you understand why you feel so exhausted all the time...

Vitamin B12 – Testing and Treatment

Work was undertaken that focused on both the testing and treatment of B12 deficiency

https://g-care.glos.nhs.uk/pathway/867/resource/11

Testing

- Majority of B12 testing is undertaken for patients with **non-specific symptoms**
- The current assay also **does not offer complete certainty in diagnosing true deficiency** (specificity of <80%).
    - The local reference range in Gloucestershire is 180-1000ng/L
    - Recent audit of B12 results showed that:
        - around 20% of samples had levels below 180ng/L
            - around 1/3 of these were in the 'deficient' range (<150ng/L)
            - the rest being indeterminate (150-180ng/L).

Vitamin B12 – Testing and Treatment

Testing (continued)

- Spuriously low B12 levels are commonly seen as a result of alterations in protein binding in pregnancy, use of the oral contraceptive pill etc.

- Studies have shown that the B12 levels within an individual patient can show large fluctuations (by up to 23%) within a period of weeks.

Vitamin B12 – Testing and Treatment

Treatment

- High level summary:
  - Patients with B12 levels of **<180** that also have **neurological symptoms** should have **IM B12** as both initial and maintenance treatment
  - Patients with B12 levels of **<180** that also have **haematological symptoms** (macrocytosis +/- anaemia) **AND are Anti-IF positive** should have **IM B12** for initial treatment. **Oral B12** can be considered for on-going **maintenance**
  - Patients with B12 levels of **<180** that also have **haematological symptoms** (macrocytosis +/- anaemia) but **are NOT Anti-IF positive** can have **oral B12**, **with the exception of those with absorption issues who should continue to have IM B12**
  - Patients **without neurological or haematological symptoms** with B12 levels of **<150**; can either **watch and wait** or treat immediately with **oral B12**
  - Patients **without** neurological or haematological symptoms with B12 levels between **150-180 do not need oral or IM treatment**

- For further details and more in-depth pathway, please see G-Care https://g-care.glos.nhs.uk/pathway/867/resource/11#chapter_4677
- Please see important information on prescription vs OTC as well as dosage

Vitamin B12 – Testing and Treatment

In current climate of Covid-19, use of oral B12 where clinically indicated should be fully explored given need to reduce F2F visits into GP Practices.

Useful information / links:

Topic	Link
Plasma Viscosity vs ESR	Adobe Acrobat Document
'I'm fishing really' — inflammatory marker testing in primary care: a qualitative study	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4758500/
Local pathology test costs	https://g-care.glos.nhs.uk/uploads/files/Primary%20Care%20Pathology%20Costs.pdf
GHNHSFT Pathology webpages	https://www.gloshospitals.nhs.uk/our-services/services-we-offer/pathology/information-service-users/
G-Care (Pathology pages) **WORK ON-GOING TO INCREASE RANGE OF INFO ON HERE**	https://g-care.glos.nhs.uk/pathway/216/resource/11

As we cannot be there in person today, please contact us with any questions you have or any suggestions for areas of work you would like us to focus on:

Zoe Riley (CCG Commissioning Manager) z.riley@nhs.net
Dr Tamsin Griffith (GP) tamsingriffith@nhs.net