GIG CYMRU NHS WALES
Bwrdd Iechyd Prifysgol Aneurin Bevan University Health Board

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PATHOLOGY NEWSLETTER

Aneurin Bevan University Health Board

Audit of Blood Sciences Pre-Analytical Errors

Pre-analytical errors are errors which occur prior to laboratory testing, and have been shown to contribute to up to 68% of all errors in medical laboratories1. Common pre-analytical errors include;

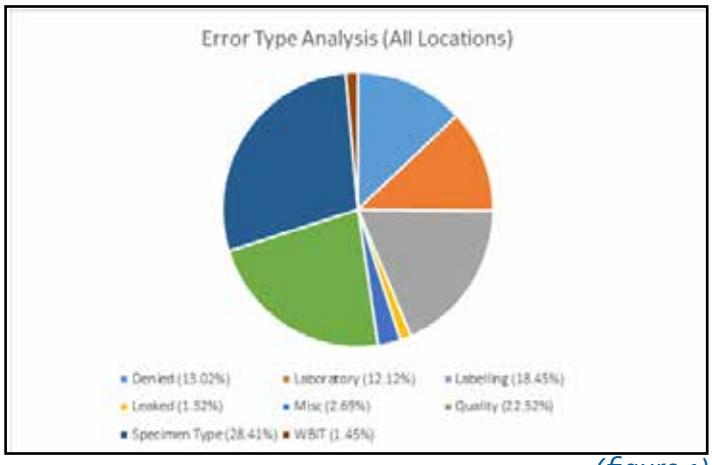
- Samples being labelled with less than 3 points of Patient Identification, samples labelled with incorrect patient details to those on the request form (if used) and samples with no labels at all.
- Samples collected in the wrong collection tube, for example, an SST sample sent for test which is performed on an EDTA sample.
- Poor quality samples, such as haemolysed or insufficient samples, often caused by poor collection technique.
- Wrong blood in tube (WBIT), where the wrong patient has been bled.
- Tests denied due to being requested before the minimum re-test interval. For example, under normal conditions TSH can only be measured once in any 26 day period; any requests made within 26 days of a previous request will automatically be denied by laboratory information management system (LIMS).

If undetected, errors such as these can lead to incorrect therapeutic investigations and diagnostic delays, both of which pose a risk to patient safety. The laboratories across the health board have standard operating procedures as regards to sample acceptance and rejection. When samples are rejected, they are assigned a code on LIMS which corresponds to the reason for rejection. This enables the requesting clinicians to see why their patients sample wasn't processed.

An audit was performed of all samples rejected due to pre-analytical errors from all locations across the health board for a 9 month period (1st January 2018 – 30th September 2018). This data was categorised by location and error type, enabling identification of any trends, and any recommendations that might improve the error rate.

The pie chart (*figure 1*) shows the different categories of pre-analytical errors. The most commonly encountered error was the incorrect sample type, with 28.41% of all the errors. Poor quality samples were the second most commonly seen, accounting for 22.52% of all errors, and the third most common error was inadequate sample labelling which accounted for 18.45% of all errors.

Audit of Blood Sciences Pre-Analytical Errors continued…



(figure 1)

References

1. West. 2017. Preanalytical errors in medical laboratories: a review of the available methodologies of data collection and analysis. *Annals of Clinical Biochemistry*. 2017; 54; 14-19

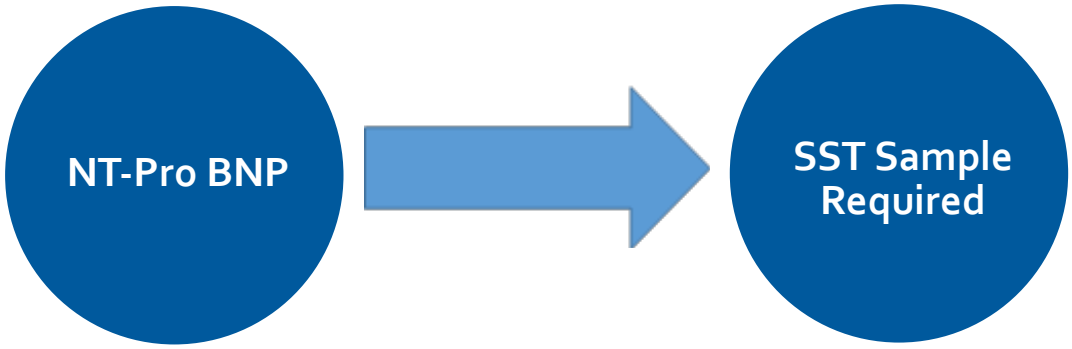
To reduce the number of samples rejected due to incorrect sample type, service users are recommended to consult the pathology hand-book which can be accessed on the Intranet via the ABUHB Applications page or using the link; *https://wphtrak.wales.nhs.uk/dept.cfm?t=8*

Alternatively the laboratory may be contacted prior to taking samples to ensure samples are collected into the correct tube. The Blood Sciences section of the pathology handbook also has information available regarding the sample labelling criteria, which should be met to ensure samples are processed. To prevent samples being rejected due to being too old for analysis, samples should be sent to the laboratory for processing on the same day they were collected.

This Month's Top Tip from Pathology

Please note!

NT-Pro BNP test.
We only require a SST sample not an EDTA.
Special request forms are no longer needed.
These used to be send away tests but they are now analysed in house.



PATHOLOGY NEWSLETTER

Suspected Carbon Monoxide (CO) Exposure

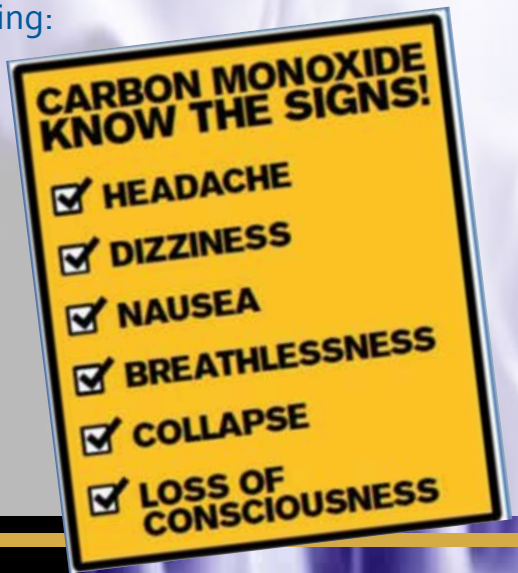
Think you're safe from the Silent Killer?

Think CO poisoning can't happen to you? *Think again!!*

Carbon Monoxide (CO) gas is invisible, with no taste, colour, or smell and it can kill you. CO poisoning can also cause long term health problems including, heart problems, brain damage and breathing problems. Home heating appliances, such as boilers and wood burners can pose serious risk of carbon monoxide poisoning if faulty, incorrectly fitted or poorly maintained. Carbon monoxide (CO) combines with haemoglobin to produce carboxyhaemoglobin (COHb), reducing the oxygen carrying capacity of the blood. CO is known as the 'silent killer' because it is colourless and odourless. Pregnant women, young children, the elderly and housebound are most at risk.

How to reduce risk? Gas appliances serviced annually. Service any fossil fuel burning appliances such as oil or coal burning stoves. Fix carbon monoxide detectors in the home and maintain and replace when needed.

So what can GPs do?
Firstly, be aware of the six signs of CO poisoning:



Remember that the symptoms of CO poisoning can appear to be similar to that of flu, migraine, food poisoning, tension headaches and depression. Headache is the most common feature, with 90% of patients reporting headache, followed by nausea and vomiting (50% of patients) and vertigo (50% of patients). If your patient presents with a headache, particularly one that has developed after midnight or early in the morning and has syncope, consider CO poisoning. Another indicator can be if your patient reports that their symptoms have improved after they have left their home. This is because, once removed from the source of exposure, CO levels in the blood decline rapidly (the half-life is four to six hours), and this, plus the non-specific symptoms, mean that cases of CO are often missed.

Acute (severe) CO poisoning can be confirmed by measuring COHb levels in blood. However, because COHb has a short half-life of just 4-6 hours it can be an unreliable indicator of exposure. The link between COHb concentration and clinical outcome is also weak. Non-smokers will typically have a baseline COHb concentration of 1-2% while in smokers this baseline will be raised (5-10%). It is also possible to measure CO in breath and you may have access to breath CO detectors which are used in smoking cessation programmes. However, while high breath CO concentrations may suggest exposure, CO

Suspected Carbon Monoxide (CO) Exposure *continued...*

can also be elevated by smoking and, as with blood tests, the tests become increasingly unreliable if several hours have elapsed since exposure. Therefore, low concentrations of COHb in blood and CO in breath cannot be used to exclude poisoning **if several hours have elapsed since exposure.**

The best action that you can take if you suspect that your patient has CO poisoning is to ensure that they are removed from the source of exposure. Do not let them go home without the likely source of CO being identified and managed. If you are treating a case, or suspected case, you should call Public Health Wales' Environmental Health Protection Team on 0300 003 0032. If you are concerned that your patient has received a high exposure to CO, refer immediately to hospital for high flow oxygen treatment.

Public Health Wales has some helpful information on CO:
http://www.wales.nhs.uk/sitesplus/888/page/50368
It has also developed an algorithm to help you determine whether your patient may have been exposed and the action to take. Further advice on how the manage CO exposure can also be obtained from TOXBASE (*www.toxbase.org*) or the National Poisons Information Service (NPIS) (Telephone: 0344 892 0111— professional use only).
This advice has also been summarised in the recent Welsh Health Circular (041) *https://gov.wales/docs/dhss/publications/whc2018-041en.pdf*

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For any queries please contact **publichealth.environment@wales.nhs.uk**

Suspected Carbon Monoxide (CO) Exposure: A Guide for use in hospital Emergency Departments and Primary

GIG CYMRU NHS WALES | Iechyd Cyhoeddus Cymru Public Health Wales

Presenting Complaint
Headache, nausea/vomiting, drowsiness, dizziness, dyspnoea, chest pain, falls, neurological symptoms, 'tired all the time'

Could this be a case of CO poisoning?

Considerations
If you are suspicious then ask the patient:

C Cohabitees/companions
Is anyone else in the property affected (including pets)?

O Outdoors
Do symptoms improve when out of the building? ('better outdoors')

M Maintenance
Over a year since heating appliances/boilers serviced?

A Alarm
Has your CO alarm been activated?

Yes to any

Acute or Chronic Exposure

Follow TOXBASE ADVICE for symptoms, signs and management of acute and chronic cases of CO poisoning. www.toxbase.org

For ACUTE EXPOSURES, TOXBASE recommends HIGH FLOW OXYGEN and, if in primary care, urgent referral to hospital.

The half-life of carboxyhaemoglobin is reduced by the administration of high concentration supplemental oxygen.
Contact the National Poisons Information Service (NPIS) 0344 892 0111
DO NOT allow your patient to go home until the likely CO source is managed

No to all

Less suggestive of CO poisoning

Still clinically suspicious

If you suspect CO exposure you must notify the Environmental Public Health Wales Health Protection Team (HPT) on 0300 00 30032 (office hours) or via ambulance control (24 hours)

Remember to complete an online notification after discussing the case with the Health Protection Team. Available at:
www.publichealthwales.org/environmental-incident-form

Carbon monoxide poisoning can simulate conditions such as flu, migraine, food poisoning, tension headaches and depression. Headache is the most common symptom: ***THINK CO!***

Sources of Carbon Monoxide

CO may be in the home, car, workplace or in tents or caravans. Malfunctioning gas, oil, coal, coke- and wood-fuelled heating and cooking appliances are the most common sources in the home.

Poisoning can occur in all income groups and types of housing. CO can leak into houses from neighbouring premises. Pregnant women, young children, the elderly and housebound are most at risk.

Testing for Exposure

Breath tests and blood samples may prove inconclusive hours after exposure has ended: CO levels in the blood decline with a half-life of about 6 hours.

A normal concentration of carboxyhaemoglobin (COHb) does not disprove CO poisoning unless the sample has been taken during or soon after exposure ended.

For interpretation of results and detailed advice on CO poisoning see TOXBASE and call the NPIS.

If you strongly suspect CO poisoning, do not wait for results, contact your local Public Health Wales HPT immediately

Actions the HPT will take to prevent further exposure
Notify others (including the gas emergency helpline on 0800 111 999)
Investigate and assess the risk of exposure to others
Recommend action to mitigate risk
Provide advice on prevention
Update the patient and clinician

Clinical follow-up is important as further consequences of chronic exposure to CO may be delayed, or mild symptoms may persist, multiply or intensify.
Recommend the purchase of an approved audible CO alarm (EN50291 compliant) for installation in the home.

KEY THINGS TO KNOW ABOUT FIT WALES

The Faecal Immunochemical Test (FIT) is a type of faecal occult blood test used to detect traces of human blood in stool samples. FIT can be used:

As the primary test in the NHS Bowel Screening Wales (BSW) programme, aimed at individuals without symptoms (screening)

As a test to guide the management of individuals who present with symptoms (symptomatic)

There are significant differences between each use of FIT which are important for health professionals to be aware of. This includes the threshold for all positive results; e.g., a patient might test negative following screening, yet receive a positive result, requiring further action, when tested symptomatically.

For ABUHB GPs supplies can be obtained by emailing: FitKit.ABB@wales.nhs.uk
NB. Supplies are issued in batches of a maximum 5 kits at any one time.

	Screening	Symptomatic
1.	FIT is currently offered to people aged 60 – 74 years*	FIT is offered to people who present with colorectal symptoms
2.	The kit is sent to eligible people in the post	The kit is given out by the GP, or sent to the patient by the lab on GP request**
3.	A replacement kit can be ordered from BSW on 0800 294 3370	Refer to local guidance on how to order a replacement kit (see above)
4.	The completed kit is returned by post to the screening centre	The patient returns the completed test to their GP practice or directly to the nominated lab**
5.	The threshold for determining a positive result is set at 150 gHb/g faeces	The threshold for determining a positive result is lower than BSW (<10 gHb/g faeces)
6.	GPs are informed of all results and receive these electronically	GPs are informed of all results and receive these electronically
7a.	Those with a positive result are normally invited for a colonoscopy pre-assessment	GPs should follow the locally developed pathway for referring patients with a positive result
7b.	Those with a negative result continue to be eligible for screening every two years	Those with a negative result may still warrant routine referral or further investigation
7c.	If the screening test is negative yet colorectal symptoms develop, GPs should consider the FIT symptomatic or 2ww pathway	A negative result does not exclude cancer – GPs should safety-net for ongoing, changing or worsening symptoms

*BSW currently invites all people between the ages of 60-74 every two years. ** Check local Pathways

July 2019

cruk.org/FIT Together we will beat cancer

PATHOLOGY NEWSLETTER

Duty.Biochemist.ABB@wales.nhs.uk

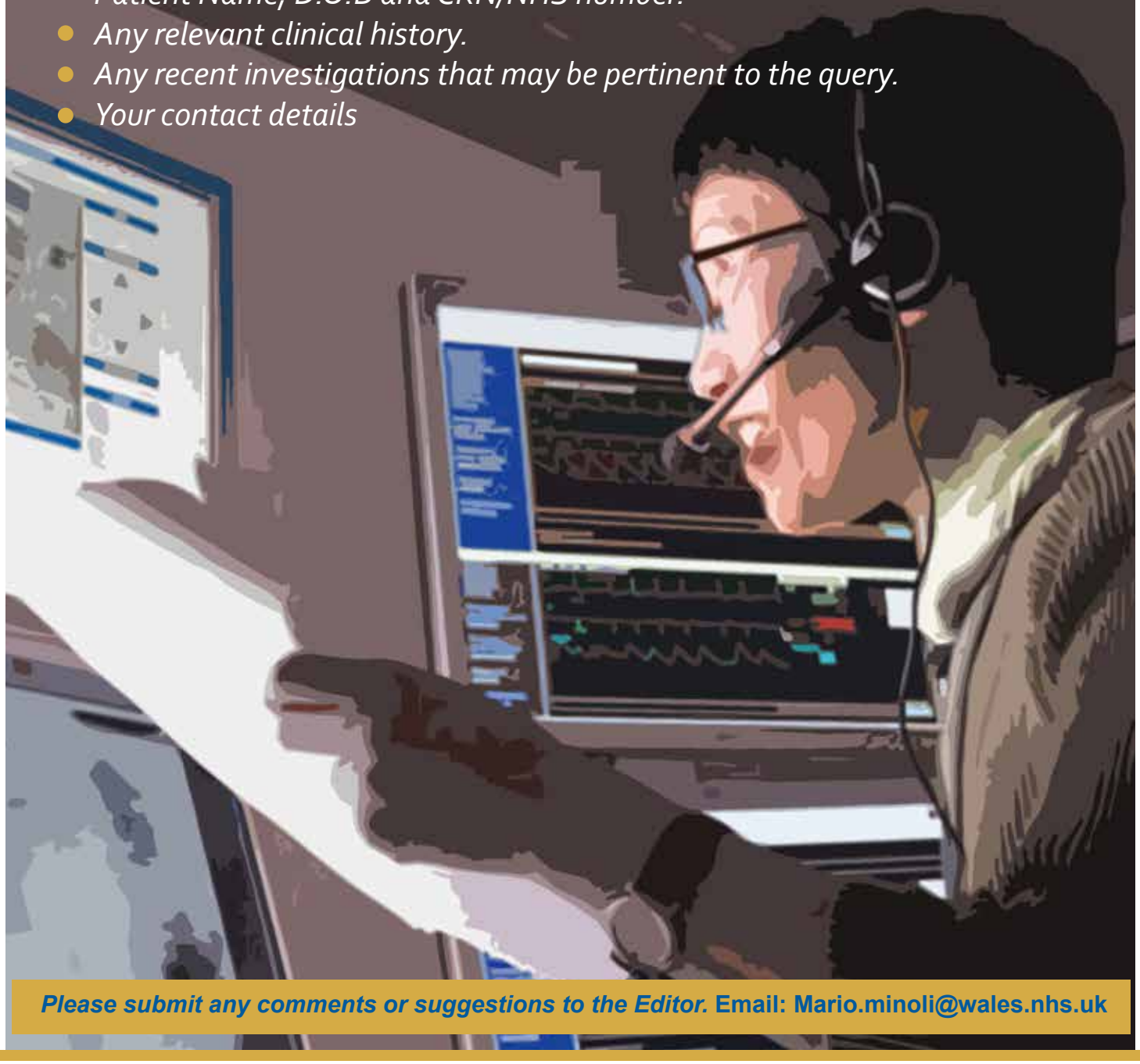
Please note the above email address can now be used to contact the duty biochemist for non-urgent clinical advice. Emails to this box will be monitored daily from Monday to Friday, and a response given within 5 working days.

Examples of information available:

- *Non urgent interpretation advice.*
- *Information on investigative protocols and algorithms.*

When contacting the Duty Biochemist, please include:

- *Patient Name, D.O.B and CRN/NHS number.*
- *Any relevant clinical history.*
- *Any recent investigations that may be pertinent to the query.*
- *Your contact details*



Please submit any comments or suggestions to the Editor. **Email: Mario.minoli@wales.nhs.uk**