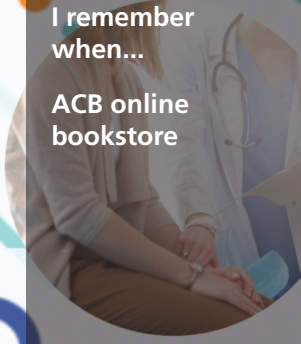
ACB News

The Association for Clinical Biochemistry & Laboratory Medicine | Issue 675 | February 2022

In this issue

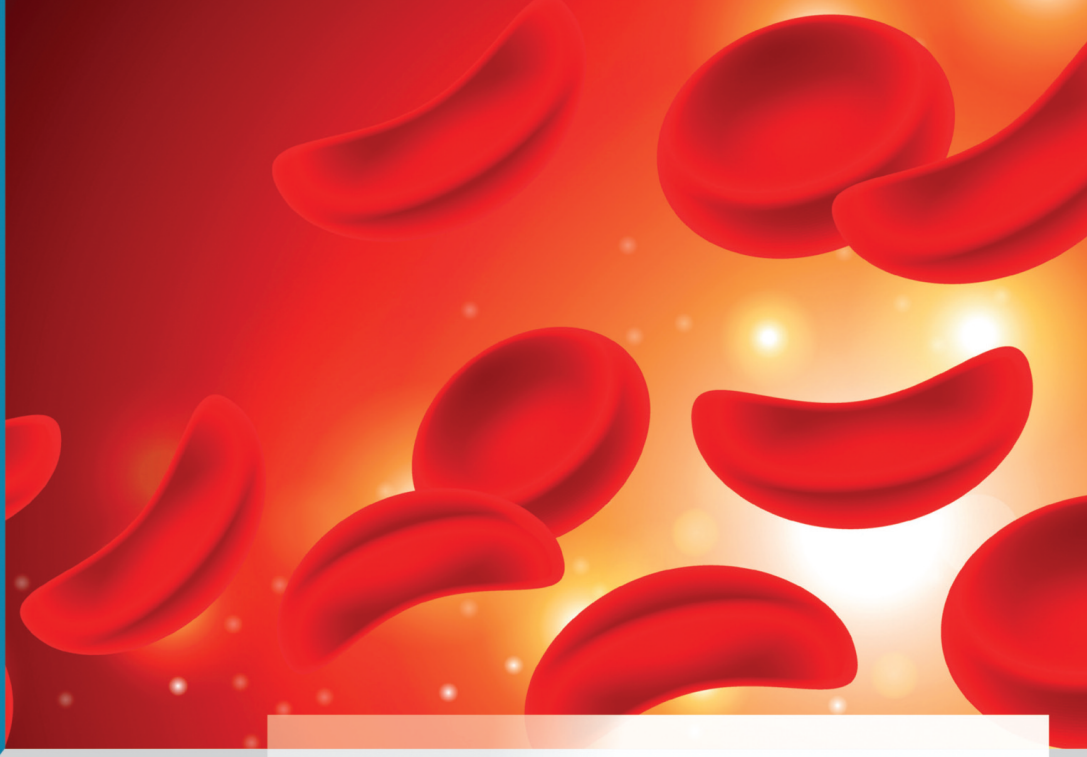


THE ASSOCIATION AWARDS UK 2021

WINNER

Best Digital Transformation

www.alphalabs.co.uk/sicklecell



Testing for Sickle Cell Disease?

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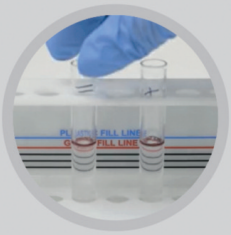

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ACB News

The bi-monthly magazine for clinical science

Issue 675 • February 2022

The Association for Clinical Biochemistry & Laboratory Medicine

Better Science, Better Testing, Better Care

ISSN 2754-0863

Front cover: The ACB is the winner of the Best Digital Transformation Award 2021

2022 . . . Another Year!

The challenges of course persist but are somewhat different again. Optimistically, society is getting better at "living" with COVID-19, both in how we control transmission, when needed, and how we manage infected patients. The concept of pandemic recovery seems more realistic again, with the role of laboratory services in that recovery being even more vital. The ACB is primed and ready to begin assisting our members in helping drive recovery by collaboration and the sharing of resources, ideas and interventions, all designed to optimise how laboratory services are used and their subsequent impact on patient care. Our "Build back with Labs" concept will hopefully now be in a position to grow and be populated with resources that we can all contribute to, share and use.

2022 is an important year for the ACB. We will closely examine our identity, name and strapline to ensure we can fully represent all of our members and are seen as the voice of Laboratory Medicine going forwards. It is vital that members are part of that discussion. We also plan to develop and launch the successor for LabTestsOnline, having rescued it from possible demise. It will need a new name, web home and funding arrangement, but this will open up many new possibilities for its scope and functionality.

Plans for our first face-to-face scientific meeting since 2019, UKMedLab22, are beginning to take shape. The meeting will take place in London in November of this year – more information coming soon on content and opportunities for participation.

Finally, I do feel I need to acknowledge the sense of anger and disappointment felt by many of us on hearing about the alleged failure by Government officials to adhere to COVID-19 restrictions over the past few years, especially given the sacrifices made by those of us working in healthcare and by the wider public. While due process needs to be allowed to proceed, and will hopefully have appropriate consequences, it remains vital that the ACB and other professional bodies remain fully engaged with Government both to continue to hopefully influence policy but also to hold them to account when necessary, and we will. ■

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Message from the CEO

A warm welcome to 2022 from everybody in the ACB staff team. By the time you read this we will all be back at Tooley Street and the office will be fully open for business again. We are hoping that this is how it will remain now and look forward to welcoming ACB Committees and Groups back to make use of our refurbished space and upgraded AV equipment for both face-to-face and hybrid meetings.
Saying that, we have been absolutely delighted by the way members have embraced remote meetings. It has enabled many more people to participate in our activities so we hope this will be a lasting positive legacy from the last two years.

As we start to review 2021 for our annual report, we can see how we have made great progress in a number of areas. We have over 4% growth in membership reversing the long term downward trend of 2% per annum for the past ten years, we delivered a new integrated national meeting, UKMedLab, comprising previous FiLM and Focus meetings and delivered it online attracting over 400 delegates, the Annals has had a bumper year with it's impact factor rising to 2.057 (up from 2.044 in 2019) and achieving one million downloads for the first time and finally, despite the constraints of the pandemic, our Committees managed to deliver a full and comprehensive events programme through the year. To top all this off, we were awarded the 'Best Digital Transformation of the Year' at the Association Awards in December.
We pioneered a new approach to industry partnership with a strategic partnership with Abbott and its Univant's Healthcare Excellence initiative which celebrates cross-discipline collaboration work globally. We will continue to develop and make progress in all these areas in 2022.

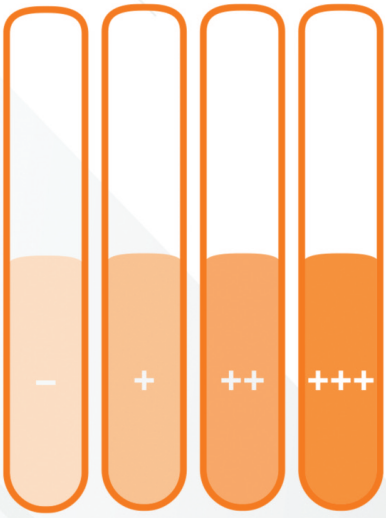
New projects already in the pipeline for

2022 include two education initiatives supported by HEE, the launch of the ACB mentoring scheme pilot, the development of our environmental strategy and plan, and the creation of new opportunities for industry support. I look forward to updating you and to working with you as these projects progress.

With regard to staff changes, I am delighted to welcome Nuno Menezes to the team, who has taken on a new role as Events & Communications Manager. You can find out more about Nuno and his role on page 16. I also want to congratulate Christine Hall-Shelton who, since returning from maternity leave in June 2020, has developed her skills and knowledge in the membership team and, as a result, has been promoted to Membership Administrator from January this year. This has enabled Mike Lester to develop the scope of his work to take on more project work particularly relating to our educational programmes.

Thanks for your continuing hard work and dedication. I look forward to supporting you in 2022.

RANDOX
QUALITY CONTROL



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ACB wins Digital Transformation Award!

The ACB has been recognised as the winner of the Best Digital Transformation at the 2021 Association Awards UK after relaunching its digital presence in October 2020 with a new website, membership system and finance system.

In 2020 the ACB was struggling with antiquated systems including a 15-year-old Customer Relationship Management (CRM) system for which support was ending. Membership mailings took six hours to send – often overnight. Direct debit mandates were paper-based and records had to be downloaded on CSV files for manual checking. Membership had declined steadily by 9% over a ten-year period. Continuous Professional Development (CPD) was managed by individuals and an outdated finance system meant that subscription options were limited.

The relaunch of a new website, membership system, events, CPD repository and finance has supported a 4.7% membership growth in 2021,10,420 hours saved in administration time and an organisational culture change.

In 2021, attendance at the ACB's (now online) annual conference has increased by 30% and the number of overseas members has expanded by 18%.

The platform has made the organisation more efficient, broken-down internal silos and supported more collaborative working with the staff team and officers of the Association. The website is an attractive calling-card for new members whose professional lives are being made easier by new online tools and services.

The Award Judges said of the ACB entry: *This is an example of a well-designed plan, having clearly identified the weaknesses in the previous system, that has subsequently focused on delivering to that plan to a high level of success.* ■

Sudoku

This month's puzzle

		H	S		R	I		
		C	I		Y	R		
			Y		C			
	S						H	
						M		
E		R				C		I
	M	T		R		Y	E	
	H						R	

Solution for December

H	E	R	Y	T	I	S	C	M
Y	I	C	S	M	R	H	T	E
M	S	T	E	C	H	Y	I	R
S	Y	I	R	H	T	M	E	C
C	H	E	M	I	S	T	R	Y
T	R	M	C	E	Y	I	S	H
R	T	H	I	Y	E	C	M	S
I	C	S	H	R	M	E	M	T
E	M	Y	T	S	C	R	I	I

NHS
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Bromide Analysis

Bromide salts are increasingly being used to treat refractory seizures in children with epilepsy.

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Nominations for ACB Foundation Award, UKMedLab 2022

Nominations are invited for the following Award to be presented at UKMedLab 2022, which is to be held in London on 8th-9th November.

The ACB Foundation Award

This Award is to acknowledge an outstanding contribution to Laboratory Medicine by an Association Member, who is normally resident in the UK. The recipient will deliver the Foundation Award, reflecting the 'state of the art' in an area of Laboratory Medicine at the national meeting.

Written nominations for this Award are sought via email from a proposer, who is a Member of the Association (excluding elected Members of Council). Nominations must be accompanied by a supporting statement outlining the nature of the contribution made by the nominee and the reasons for consideration for the Award.

Nominations should be sent to: Mrs Sarah Robinson, ACB Director of Conferences and Events, Consultant Clinical Scientist, Biochemistry Department, North Midlands and Cheshire Pathology Services. Email: **sarah.robinson2@uhnm.nhs.uk**
Closing date: 30th March 2022. ■

The Integrated Care System & Laboratory Medicine Webinar

Wednesday 10th February 2022 15.00-16.30

ACB Webinar facilitated by Abbott Diagnostics

Chaired by Lisa Harrison, Marketing Director, Abbott Diagnostics

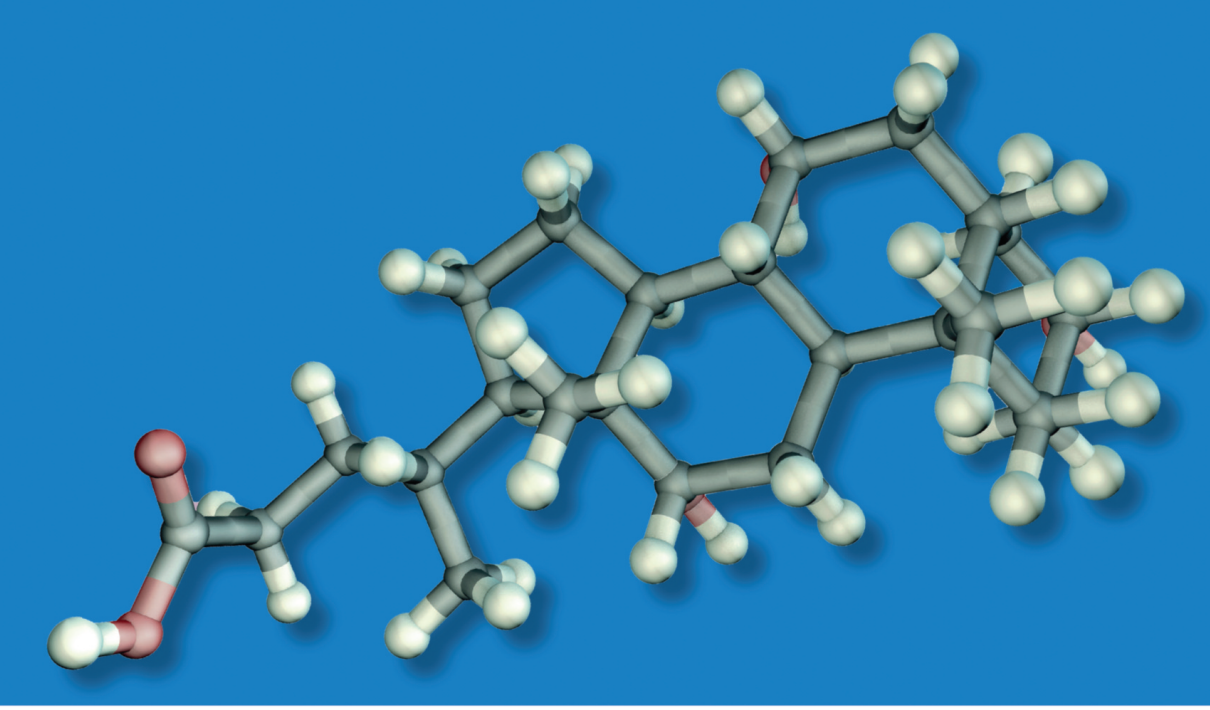
10th February, 3-4.30pm

There are still places available on the ACB's webinar facilitated by Abbott Diagnostics where you will have a chance to hear from leaders in NHS laboratory medicine about the NHS England Integrated Care System collaborative working model.

This is a free education event for senior managers and emerging leaders in the NHS laboratory medicine community, covering topics such as:

- What are the ICSs, how are they structures and how will they impact laboratory medicine?
- Promoting the critical role of laboratory medicine in integrated patient care
- Influencing decision making and funding decisions
- Making diagnostic data work for your ICS's clinical priorities
- Identifying opportunities to access transformation and innovation funds available to ICSs.

Find out more about this lunchtime webinar and register for it here. ■



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ACB Membership Awards 2022

Nominations for this year's Awards are invited from Regional Committees, together with a citation of about 500 words, outlining the basis of the nomination.

The Award must be approved by Council at its meeting in May 2022, and it is important that the Regional representative is able to extol the virtues of the nominated individuals.

The three award categories are:

Emeritus Member

Persons who have been Ordinary Members of the Association for at least ten years and have retired from full-time employment and who have made an exceptional contribution to the objects of the Association may, on the recommendation of Council and by a majority of at least two-thirds of those voting at a General Meeting, be elected Emeritus Members of the Association.

Fellow of the Association

Persons who have been Ordinary or Affiliate Members of the Association for at least ten preceding consecutive years and have retired from full-time employment may, on the recommendation of Council and by a majority of at least two-thirds of those voting at a General Meeting, be elected to the category of Fellow of the Association.

The recipients have made a significant contribution to the profession in one or more of the following areas:

- Continually led and instigated changes to meet the needs of Clinical Biochemistry and Laboratory Medicine services on behalf of a region or nationally.
- Developed exceptional educational and/or training facilities for the profession.
- Led in setting up and developing, over a considerable period of time, a well-respected and valued specialised service that had a major impact either within a region or nationally.
- Raised the profile of the profession over many years, within the lay or clinical community, either regionally or nationally.

Honorary Member

Persons who have made a distinguished contribution to Clinical Biochemistry and Laboratory Medicine at international level may, following the recommendation of Council and by a majority of at least two-thirds of those voting at a General Meeting, be elected Honorary Members of the Association.

If you would like to propose someone then contact your ACB Regional Secretary. Proposals must be supported by the Regional Committee and the nomination submitted through the Regional Committee at the Council meeting in May 2022.

The closing date for nominations received by Council is 29th April 2022. ■

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REFERENCES:

1. Alinity i TBI H22974R01. Instructions for use. Abbott Ireland Diagnostics Division. Sligo, Ireland; October 2021.

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Revised laboratory guidelines for handling samples from patients with Transmissible Spongiform Encephalopathy

Dr Alison Green, Head of CSF Diagnostics, The National CJD Research & Surveillance Unit, University of Edinburgh

The Advisory Committee on Dangerous Pathogens' Transmissible Spongiform Encephalopathy (ACDP TSE) subgroup has revised the laboratory guidelines for handling TSE tissues to make them clearer and more easily understood. Under this guidance, which was published on 18th November 2021, no additional precautions are needed for the analysis, storage and disposal of cerebrospinal fluid (CSF), blood, saliva and urine samples from patients with suspected Creutzfeldt-Jakob disease (CJD), over and above those precautions taken for other CSF, blood, saliva and urine samples. It is important that each laboratory undertakes their own risk assessment for the handling of these samples and this recent guidance should make this process easier. The guidance for handling, analysis and storage of high risk materials such as brain and other nervous tissue has NOT changed.

- ACDP TSE subgroup, Minimise transmission risk of CJD and vCJD in healthcare settings, Part 3 Laboratory containment and control measures. **https://www.gov.uk/government/publications/guidance-from-the-acdp-tse-risk-management-subgroup-formerly-tse-working-group**

ACB launches online bookstore

Kam Chatha, ACB Director of Publications & Communications

I'm delighted to announce that we have now launched an online bookstore on Amazon through which members and the public can buy our publications at a discounted rate.

This new facility will make it much easier to purchase our publications directly online and your orders will be shipped in a matter of days. If you are interested in purchasing one of our books you can simply visit **ACB's Bookstore** to browse our initial selection.

You will find some popular titles like *Clinical Cases and Laboratory Medicine, Neonatology and Laboratory Medicine*, among many others.

Currently there is a limited number of titles listed while we trial this new process, but our full catalogue will be made available shortly. We will update you as more publications become available but in the short term, if you can't find the book you are looking for online, please get in touch with the **ACB team**.

We are also planning reprints of

popular titles and new titles which may be of interest to members so please feel free to **contact us** with your suggestions.

UKMedLab22

London • 7-9 November

We are pleased to announce that UKMedLab22 will take place on the 7th, 8th and 9th November 2022 at the Royal College of Pathologists' events venue, Events @ No. 6 in Aldgate, London.
As in previous years, we will kick-off with the Training Day on Monday 7th, followed by the Symposium on Tuesday 8th and Wednesday 9th November.
Tickets will be made available for purchase in the summer, but we will be sharing more information about the price of tickets and the booking process in April.
If you are interested in sponsoring UKMedLab22 please get in contact with **nuno@acb.org.uk** to discuss the different opportunities available. ■

BIMDG Annual Conference – June 2022

The British Inherited Metabolic Disease Group Annual Meeting is due to take place in person from 8th to 10th June 2022 at the Hilton Hotel Gateshead.

The programme has been organised by the Metabolic and Mitochondrial teams in Newcastle and includes topics of interest to staff working in Clinical Biochemistry and Metabolic Medicine.

Please visit the website for the programme and for more information on registration: **www.bimdgconference.org** ■

New staff announcement: Nuno Menezes, Events & Communications Manager

The ACB is delighted to welcome a new member of staff, Nuno Menezes, who joined us on the 4th January in the newly created role of Events & Communications Manager.

The role was designed to support and profile all the activity that our committees conduct and ensure there is cohesion in all points of engagement with our members and the public. It will also help the ACB formalise a communications strategy to showcase our work and build our digital and social media presence.

Nuno has spent most of his career working on projects funded by the public and private sector which were developed to foster entrepreneurship and boost local economies. Through these projects he has worked with people from all backgrounds, nationally and internationally, to help them set up new businesses and grow their already existing businesses, with a particular focus on social enterprises and start-ups that drive innovation.

Now with the ACB, Nuno hopes to leverage the experience gained from working with entrepreneurs and businesses from across different sectors and focus it on laboratory medicine and the work being done by the ACB to help improve the sector's practices and patient care. ■

I remember when . . .

By William Marshall

I have to hand a copy of *Clinical Biochemistry* by Ivan Maxwell of the University of Melbourne, published in 1925. The preliminary pages are stamped 'Library, NSW branch of the British Medical Association' and I have no idea how it has ended up on my bookshelves, though it is most likely that I saw it in one of the many second hand book shops in Hay-on-Wye.

The first chapter, 'Albuminuria', lists the causes as acute and chronic nephritis, cardiac failure and febrile conditions, all of which are of course still recognised causes, but there is no mention of microalbuminuria, the first reports of which as far as my researches have taken me was in the 1980s. Albumin was measured using Esbach's reagent. This was prepared (all reagents would have been prepared in-house in those days) by dissolving 10 g of picric acid and 20 g of citric acid in one litre of water. Special apparatus was required – a graduated tube bearing the marks U and R, and closed by a rubber stopper. The tube was filled with urine to point U and the reagent added to bring the meniscus to point R, the tube closed with the stopper, urine and reagent mixed and the tube left for 24 hours before reading the result (the level of the protein precipitate).

This was not a high throughput method! And there is no mention of standardisation, quality control or quality assurance, procedures for which were only introduced (largely, I think, by Tom Whitehead in Birmingham) in the 1970s. Presumably the apparatus would have been prepared in the laboratory by the glassblower. Even I, learning my trade in the 1970s, can remember taking broken pieces of apparatus to this highly skilled technician for repair. Furthermore, to add to the complexity of the procedure, the urine had to be absolutely clear before testing for albumin and if it were not, had first to be filtered through a pleated filter paper.

A hundred years ago, urea was the only measurable test for renal function. The normal value was considered to be 20-30 g/dL (7.1-14.3 mmol/L). Any amount over 28 mmol/L 'may be considered to be abnormally high'. There is no mention of creatinine or cystatin in Maxwell's book. The procedure for measuring urea was MacLean's method, and involved the use of potassium dihydrogen phosphate, 0.01 M sulphuric acid, caprylic alcohol, soya bean (a source of urease, methyl red and potassium carbonate) with a final step being titration with 0.01 M sodium hydroxide. I estimate that even in experienced hands, a single measurement of blood urea would have taken the best part of a day.

In these days, when we expect our analysers to provide a rapid throughput of high numbers of samples, it is difficult to imagine how clinicians were able to manage their patients given the complexity, time taken for results to be generated and potential unreliability of the analytical methods that were available. And there were no CT scanners or MR imaging. They relied hugely on their clinical skills and experience. These are of course still key to diagnosis but one can only admire the physicians of old who had no access to the wealth of information so readily available to clinicians today. ■

What is the most important quality of a Clinical Toxicologist?

Jenny Hamilton, Consultant Clinical Scientist, Southern Health & Social Care Trust

As I recently changed jobs, I decided to write down some of the more memorable queries I came across in my previous post as a Principal Clinical Scientist in the Northern Ireland Regional Toxicology Laboratory. Here's a small selection of them along with my initial reactions.

1. Can you measure Lyrica (pregabalin) on my patient? The boy in the bed next to him has been feeding it to him to see what it would do.
   After initially being concerned about the patient being fed pregabalin, I was then mightily impressed with the 17 year old boy who had been conducting his very own clinical trial before deciding whether pregabalin was a drug he would like to take himself.
2. My patient keeps passing a pill and we don't know which it is. Would you be able to analyse it if we send the stool containing it to you, so we can identify which of the pills he is prescribed is not being absorbed?
   Definitely not! I'm not putting anything like that near the LC-MS/MS!
3. Can you do a urine drugs of abuse screen on a baby if I cut a bit off their nappy and send it to you?
   Seriously? Have they never seen the "stuff" that is inside a nappy?
4. My patient has been drinking embalming fluid that he has been buying online. What tests do I need to do?
   One simple question sprang to mind – Why? This was followed by "I wonder has he pickled his insides?"
5. My child has drunk a bottle of potpourri oil. What tests do I need to do? *Aaargh! There's no entry for that one on TOXBASE!*
6. Can you do a toxicology screen on this sample of blackcurrant Fruit Shoot?
   I know Fruit Shoots are not ideal for kids, but I didn't think they were that bad! Hmmmm, I think I'll send my children to school with water from now on . . .
7. I have a one year old here in Children's ED who has bitten into a snow globe and swallowed the contents. Should I be testing for anything?
   Much to my surprise and delight there actually is an entry in Toxbase for snow globe!! Turns out, there is ethylene glycol in a snow globe so we had to test the child for ethylene glycol poisoning.
8. My patient has ingested fake tan and bleach in a suicide attempt.
   Do I need to test her for anything?
   My initial thought was "No" followed quickly by "I wonder what colour she is now?"
9. Can you test this drip fluid for drugs of abuse? My patient is on a paracetamol drip but, after disappearing off the ward, he came back acting strangely.
   We analysed the fluid offline for paracetamol, drugs of abuse and ethanol. Turns out the patient had met a friend outside the ward who gave him a bottle of spirits which he proceeded to pour into his drip bag, so he was actually getting IV paracetamol in ethanol – nice! I wonder what his LFTs were like.....

These are just a few of the questions I got asked on a daily basis. The situations ranged from the slightly strange to completely bizarre. So, in answer to the question "What is the most important quality of a Toxicologist?"– *An open mind!* ■

Develop your career and support your profession

ACB welcomes applications for membership from health professionals and corporate bodies from the whole spectrum of laboratory medicine and healthcare science around the world. We are the representative voice for laboratory medicine and an established scientific authority.

ACB members have access to:

- a unified community platform to share best practice in laboratory medicine
- support from the recognised trade union for clinical scientists in the UK
- an internationally peer reviewed journal – Annals of Clinical Biochemistry
- news and updates on current issues and development opportunities in pathology through a regular newsletter and digital communications
- a programme of CPD accredited national and regional education and training events at discounted rates
- grants, bursaries and scholarships to support scientific research and innovation
- the opportunity to contribute to the profession and build your profile through committee engagement, peer reviews and expert representation.

To find out more about the benefits and eligibility for membership please contact Mike Lester: mike@acb.org.uk or +44(0)20 4542 6044

The Association for Clinical Biochemistry & Laboratory Medicine

ACB New Members 2021

Despite what was an unusual year of remote events and distance learning we are delighted to have welcomed well over 100 new Members in 2021. We look forward to working with them and supporting their continued professional development in 2022 and in the years to come.

Jasem Abbas (Consultant, Al.Sabajh Hospital)
Omneya Abdelkarem (Clinical Fellow, Faculty of Medicine for Girls - Al Azhar University)
Roshaida Abdul Wahab (Post doctoral Clinical Fellow in Chemical Pathology, CRC, St. Vincent's University Hospital)
Mohamed Ahmed (Speciality Registrar in Chemical Pathology, York Teaching Hospital NHS Foundation Trust)
Suha Ahmed (ST3 Chemical Pathology Trainee, St Helens and Knowsley Hospitals NHS Trust)
Summer-Louise O'Connor Ajayi (Trainee Clinical Scientist, Birmingham Women's and Children's NHS Foundation Trust)
Banke Ajayi-Obe (Trainee Clinical Scientist, Health Service Laboratories Analytics LLP)
Damilare Akintade (Trainee Healthcare Scientist, Cambridge University Hospitals NHS Foundation Trust)
Salwa Alhajji (Physician, Mubarak Hospital, Kuwait)
Mary Anderson (Clinical Biochemist, St Vincent's University Hospital)
Jonathan Atkins (Trainee Clinical Scientist, Manchester University NHS Foundation Trust)
Yulia Berkun (Trainee Clinical Scientist, Wrexham Maelor Hospital)
Clinton Blackburn (UKAS Technical Assessor)
Sarah Blampied (Trainee Healthcare Scientist, Royal Devon and Exeter NHS Foundation Trust)
Jessica Brown (Trainee Biochemist, Bolton NHS Foundation Trust)
Phillipa Burns (Principal Clinical Scientist, Hull University Teaching Hospitals NHS Trust)
Juozas Butenas (Trainee Clinical Scientist, Imperial College Healthcare NHS Trust)
Eileen Byrne (Senior Clinical Biochemist, St. Vincent's University Hospital)
Rebiye Chakartash (ST1 Chemical Pathologist, Hull University Teaching Hospitals NHS Trust)
Sirazum Choudhury (SpR in Metabolic Medicine, Imperial College Healthcare NHS Trust)
Carina Conceicao (Clinical Scientist Trainee in Biochemistry, Glasgow Royal Infirmary)
Naomi Cope-Selby (HSST Clinical Scientist, University Hospitals of North Midlands)
Angela Corridan (Senior Biochemist, University Hospital Limerick)
Amy Coward (Senior Clinical Scientist, Mid and South Essex NHS Foundation Trust)
Yoshibye Crustna (Trainee Healthcare Scientist, Barts Health NHS Trust)
Ruth Cullen (Senior Clinical Biochemist, The Mater Misericordiae University Hospital)
Nicola Cumley (Clinical Scientist / Post doctoral Researcher, University of Birmingham)
Stuart Cunningham (Specialist Biomedical Scientist, Golden Jubilee National Hospital)
Cassandra Dix (Trainee Clinical Scientist, Northern Devon Healthcare NHS Trust)
Felicity Duty (Trainee Clinical Scientist, East Suffolk and North Essex NHS Foundation Trust)
Louise Duvall (Trainee Clinical Scientist, Portsmouth Hospitals NHS Trust)
Ikenna Ebere (Specialist Registrar, Manchester University NHS Foundation Trust)
Osama Eisa (Specialty Registrar (Chemical Pathology), Leeds Teaching Hospitals NHS Trust)
Rachid El Khouly (Doctoral student, University of the West of England)
Marwa Elgizouli (Specialty Trainee, Salford Royal NHS Foundation Trust)
Oluwayemisi Esan (Specialist Registrar, Guy's and St Thomas' NHS Foundation Trust)
Charlotte Evans (Trainee Clinical Biochemist, The Royal Wolverhampton NHS Trust)
Charlotte Fairclough (Technical Analyst, National Institute for Health and Care Excellence)
Jonathan Fenn (Trainee Clinical Scientist, The Royal Wolverhampton NHS Trust)
Oliver Fletcher (Trainee Clinical Scientist, University Hospitals of Leicester NHS Trust)
David Foley (Senior Biochemist, Beaumont Hospital)
Thomas Ford (Trainee Clinical Scientist, Royal Berkshire NHS Foundation Trust)
Hannah Fox (Postdoctoral Research Assistant/Clinical Scientist, Oxford Autoimmune Neurology Group)
Rebecca Gama Paulo (Clinical Scientist, Nottingham University Hospitals NHS Trust)
Manjot Gill (Trainee Clinical Scientist, Morriston Hospital)
Christopher Gonde (Senior Clinical Scientist, King's College Hospital NHS Foundation Trust)
Callum Goolden (Trainee Clinical Scientist, Lancashire Teaching Hospitals NHS Foundation Trust)
Kavindi Gunaratne (Trainee Clinical Scientist, University Hospitals Plymouth NHS Trust)
Liam Handley (Senior Biomedical Scientist, St Helens and Knowsley Hospitals NHS Trust)
Muhammad Haroon (MBBS Student, Gujranwala Medical College)
Gregory Heikel (Trainee Clinical Scientist, Nottingham University Hospitals NHS Trust)
Gulzar Hemnani (Senior Biomedical Scientist, Mid and South Essex NHS Foundation Trust)
Luke Hibberd (Trainee Clinical Scientist, Gloucestershire Hospitals NHS Foundation Trust)
Johnathan Ho (Trainee Clinical Scientist, The Royal Wolverhampton NHS Trust)

Robert Humphrey (ST1 Chemical Pathology, Oxford University Hospitals NHS Foundation Trust)
Melanie Hunt (Trainee Clinical Scientist, Cambridge University Hospitals NHS Foundation Trust)
Rebecca Jones (Trainee Clinical Scientist, Mid and South Essex NHS Foundation Trust)
Charlene Junkin (Trainee Clinical Scientist, NHS Tayside)
Mohammed Yousuf Karim (Consultant Immunologist, Sidra Medicine)
Magdalena Karlikowska (Trainee Clinical Scientist, Public Health England)
Lucille Kavanagh-Wright (Principal Biochemist, Mater Misericordiae University Hospital)
Eun Ji Kim (ST5 Metabolic medicine, Guy's and St Thomas' NHS Foundation Trust)
Emily Kingston (Trainee Clinical Scientist, Northern Care Alliance NHS Foundation Trust)
Clodagh Kivlehan (Senior Clinical Biochemist, St Vincents University Hospital)
Monika Dham Kohli (Consultant, North West Anglia NHS Foundation Trust)
Wah Wah Kyaw (ST4 Chemical Pathology and Metabolic Medicine, Oxford University Hospitals NHS Foundation Trust)
Eric Law (Doctor, Queen Mary Hospital, Hong Kong)
Rebecca Lo (Trainee Clinical Scientist, University Hospitals Of Leicester NHS Trust)
Helen Lock (Senior Biomedical Scientist, Viapath Group LLP)
Philip Logue (Specialist Biomedical Scientist, Antrim Area Hospital)
Nathan Lorde (Specialist Trainee in Chemical Pathology/Metabolic Medicine, University Hospitals Birmingham NHS Foundation Trust)
Ulf Daniel Lundqvist (Trainee Clinical Scientist, East Kent Hospitals University NHS Foundation Trust)
Amro Maarouf (Specialist Trainee Chemical Pathology, Heart of England NHS Foundation Trust)
Rachel MacAndrew (Specialist Biomedical Scientist, York Teaching Hospital NHS Foundation Trust)
Madia Mahmood (Senior Clinical Scientist, The Christie Pathology Partnership)
Furzana Malik (Senior Technologist, Sidra Medical and Research Center)
Dean Manchett (Head of Clinical Biochemistry, HSL)
Victor Manolov (Head of Laboratory, Medical University Sofia)
Hannah Marlow (Trainee Clinical Scientist, Norfolk and Norwich University Hospitals NHS Foundation Trust)
Joanne Martin (Professor of Pathology,)
Alexandra Matthews (Trainee Clinical Biochemist, University Hospitals Birmingham NHS Foundation Trust)
Anna McHugh (Consultant Clinical Scientist, Hull and York Pathology Service)
Martin McHugh (Principal Clinical Scientist, NHS Lothian)
Katy McKee (Clinical Scientist, Belfast Health & Social Care Trust)
Susanne McMurray (Senior BMS, Norfolk and Suffolk NHS Foundation Trust)
Stacey McNutt (Biomedical Scientist, Belfast Health and Social Care Trust)
Ellen Mobley (Trainee Clinical Scientist, Lancashire Teaching Hospitals NHS Foundation Trust)
Dowa Mohamed (Speciality Doctor, Mid Yorkshire Hospitals NHS Trust)
Sally Morton (Trainee Clinical Biochemist, Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust)
Emma Murray (Specialty Trainee Chemical Pathology, Royal Victoria Hospital)
Madhavi Nallagonda (Specialty Doctor, Luton and Dunstable University Hospital NHS Foundation Trust)
Ayesha Nowbuth (Trainee Clinical Scientist, London North West Healthcare NHS Trust)
Ijeoma Okoliegbe (Trainee Clinical Scientist, Aberdeen Royal Infirmary)
Katy Onions (Trainee Clinical Scientist, Aberdeen Royal Infirmary)
Olufemi Oyerinde (Biomedical Scientist, The Princess Alexandra Hospital NHS Trust)
Laura Parry (Trainee Clinical Scientist, Aneurin Bevan University Health Board)
Sophie Peake (Student, University of Bristol)
Kathleen Pheasant (Trainee Clinical Scientist, Public Health Wales)
Marie-Claire Pickering (Clinical Biochemist, St. Vincent's University Hospital)
Gianfranco Pintus (Professor, Head of Department, Medical Laboratory Sciences, University of Sharjah)
Anna Platt (Trainee Healthcare Scientist, Cambridge University Hospitals NHS Foundation Trust)
Bernard Poggi (Clinical Biologist - Laboratory Director, Croix Rousse Hospital)
Joseph Porter (Trainee Clinical Scientist, North Bristol NHS Trust)
Kathryn Price (Trainee Clinical Scientist, East Suffolk and North Essex NHS Foundation Trust)
John Rafferty (Trainee Clinical Scientist, Royal Group of Hospitals Belfast)
Ailsa Ralph (Trainee Clinical Scientist, NHS Lanarkshire)
Ganaesh-Kumaar Ramanathan (Senior Biomedical Scientist, Gloucestershire Hospitals NHS Foundation Trust)
Jordan Roper (Trainee Clinical Biochemist, NHS Wales)
Sanjiv Rughooputh (Clinical Virologist/ Scheme Director, UK NEQAS for Microbiology)
Ritesh Sah (ST3 Chemical Pathology, The Dudley Group NHS Foundation Trust)
Ellen Sargeant (Clinical Scientist, Frimley Park Hospital NHS Trust)
Nadia Shahid (Senior Clinical Scientist, NHS Greater Glasgow & Clyde)
Aditi Sharma (Doctor,)
Alex Shaw (Trainee Healthcare Scientist, Barts Health NHS Trust)
Tsz Yau Shek (Trainee Clinical Scientist, University Hospitals of North Midlands)
Jaya Shrivastava (UK NEQAS Parasitology Scheme Manager, Public Health England)
Patrick Simms (Senior Biomedical Scientist, University Hospitals Bristol and Weston NHS Foundation Trust)

Edwin Smith (Trainee Clinical Scientist, Sheffield Children's NHS Foundation Trust)
Karen Smith (Principal Clinical Scientist, University Hospital Southampton NHS Foundation Trust)
Gareth Staton (Research Associate, Institute of Infection)
Jonathan Strachan (Trainee Clinical Biochemist, NHS Greater Glasgow & Clyde)
Kyle Sudworth (Specialist Biomedical Scientist, Warrington and Halton Hospitals NHS Foundation Trust)
Carl Talbot (Senior Clinical Biochemist, Mater Misericordiae University Hospital)
Darmiga Thayabaran (Core Medical Trainee, Whittington Health NHS Trust)
Indra Tiwari (Trainee Clinical Scientist, University Hospitals of North Midlands)
Naomi Todd (Clinical Scientist, The Belfast Health and Social Care Trust)
Miroslav Tomovic (Medical Doctor, Specialist of clinical biochemistry, Medical Center Petrovac)
Toral Vegad (Trainee Clinical Biochemist, Royal Berkshire NHS Foundation Trust)
Georgina Wallace (Senior Specialist Biomedical Scientist, The Royal Marsden NHS Foundation Trust)
Courtney Watt (Trainee Clinical Biochemist, NHS Greater Glasgow & Clyde)
Hannah Wheeler (Trainee Clinical Biochemist, Gateshead Health NHS Foundation Trust)
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Patricia Woodley (Trainee Clinical Scientist, Torbay and South Devon NHS Foundation Trust)
Hannah Worthington (Trainee Clinical Scientist, Glasgow Royal Infirmary)
Francis Yongblah (Laboratory Manager and HSST Clinical Scientist, Great Ormond Street Hospital for Children NHS Foundation Trust)
Marketa Zajicek (Trainee Clinical Biochemist, Glasgow Royal Infirmary)

Publication Deadlines

To guarantee publication, please submit your article by the 1st of the preceding month (i.e. 1st March for April 2022 issue) to:
editor.acbnews@acb.org.uk
We try to be as flexible as possible and will accept articles up to the 20th to be published if space allows. Otherwise they will be held over to the next issue. If we are aware that articles are imminent, this gives us more flexibility and we can reserve space in anticipation.
If in doubt, please contact Gina Frederick, Lead Editor, via the above e-mail. ■

LAB TESTS ONLINE UK

Your Trusted Guide

Peer Reviewed • Non-Commercial • Patient Centred

Produced by The Association for Clinical Biochemistry & Laboratory Medicine

With support from The Royal College of Pathologists — Pathology: the science behind the cure; IBMS

Lab Tests Online-UK is a non-commercial website written by practising laboratory medics and scientists with lay editorial review of content to ensure its suitability. The aim of the website is to help patients and the public, including healthcare professionals, understand the many clinical laboratory tests that are used in diagnosis, monitoring and treatment of disease.

LTO-UK fact of the month

We have lots of literature to send out if you have any sort of public engagement event through your Trust, such as Healthcare Science Week, Biomedical Science Day or National Pathology Week. Leaflets are good to give to people visiting your stand at careers evenings or open days. Just contact us at the email address below.

Meet the Lab Tests Online-UK Board

Patient Representative, Dr Patricia Wilkie OBE

Patricia is a social scientist with a PhD in examining the social and psychological implications of inherited disease. Throughout her working life, in academic departments of medicine in Scotland and London, she has supported different voluntary organisations with the aim of pursuing the interests of patients in healthcare. Patricia is the current President and former Chairman of the National Association for Patient Participation (NAPP) where she promotes LTO amongst members and professional colleagues. She sits on several national NHS committees and works with the RCGP, BMA, GMC, CQC and is a Reader for the Queen's Anniversary Prizes. Patricia is the author of many articles promoting the interests of patients.

Most patients want to look after themselves and benefit from the excellent information provided by LTO. As an LTO board member since 2012, Patricia can introduce professional colleagues to patient organisations and encourages the use of patient friendly language in explaining complex ideas. David, her husband, is an actuary who is still working. They love travelling to see family in Switzerland, St Lucia and Quebec. So, until travel is easier, her spare time is spent learning Portuguese and tidying up the "stuff" in the family house.

What's new on LTO?

We have an article on NICE recommending the siRNA-based (small interfering RNA) drug Inclisiran in secondary prevention of MI and stroke which works by down-regulating the expression of PCSK9. Although it's an expensive drug, NICE have determined that the evidence suggests that it is a cost-effective intervention in patients with a previous cardiovascular event. You can read the article **here**.

Get involved – Join the editorial team

If you are interested in contributing to the vital work of the editorial team to keep the website up to date and to introduce new material please contact us for more information.

Become a Lab Tests Online-UK champion

Join our champions and promote LTO-UK locally and nationally. Champion packs provide a great starting point with ideas and marketing materials, for more information or to join our champions please contact us.

Email: **labtestsonlineuk@acb.org.uk** Website: **labtestsonline.org.uk** Follow us

Deacon's Challenge Revisited

No 18 - Answer

A 25 year old woman was seen at an orthopaedic clinic. Since the age of five she had "knock knees" and had several osteotomies over the years to correct the deformities. Her height was 158 cm. Her mother and grandmother had mild knock knees. Laboratory results obtained on morning fasting samples were as follows:

Plasma phosphate = 0.52 mmol/L
Plasma creatinine = 89 µmol/L
Urine phosphate = 13.5 mmol/L
Urine creatinine = 6.52 mmol/L

She was on a reasonably constant diet, with moderate phosphate and calcium intake for several days before sample collection. Calculate:

a) The fractional excretion of phosphate (FEP)
b) The fractional tubular reabsorption of phosphate (TRP)
c) The renal tubular reabsorption of phosphate (TMP/GFR).

MRCPath November 2001 – modified

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a) The fractional excretion is the proportion of filtered phosphate (which is related to the GFR) which is excreted in the urine.

$$\text{Fractional excretion of phosphate (FEP)} = \frac{\text{phosphate clearance}}{\text{creatinine clearance}}$$

$$\text{Phosphate clearance} = \frac{U_{PO4} \times V}{P_{PO4}}$$

$$\text{Creatinine clearance} = \frac{U_{cr} \times V}{P_{cr}}$$

Where
U_{PO4} = urine phosphate = 13.5 mmol/L;
P_{PO4} = plasma phosphate = 0.52 mmol/L
U_{cr} = urine creatinine = 6.52 mmol/L
P_{cr} = plasma creatinine = 89 µmol/L
V = urine flow rate (mL/min)

$$FEP = \frac{U_{PO4} \times V}{P_{PO4}} \div \frac{U_{cr} \times V}{P_{cr}}$$

In order to divide, invert the second clearance and multiply. The ' V' term then cancels:

$$FEP = \frac{U_{PO4} \times V}{P_{PO4}} \times \frac{P_{cr}}{U_{cr} \times V}$$

$$FEP = \boxed{\frac{U_{PO4} \times P_{cr}}{P_{PO4} \times U_{cr}}}$$

Substitute values for U_{PO4}, P_{cr}, P_{PO4} and U_{cr}. The same units must be used throughout. Creatinine is given in µmol/L, divide by 1000 to convert to mmol/L

$$Pcr = 89\ \mu mol/L = \frac{89}{1000} = 0.089\ mmol/L$$

$$FEP = \frac{13.5 \times 0.089}{0.52 \times 6.52} = \mathbf{0.35}$$

N.B: FEP is a ratio and so does not have any units.

b) The proportion of the filtered phosphate that is reabsorbed (TRP) must be the difference between the fraction excreted (FEP) and 1 (assuming that no phosphate is secreted by the tubules)

$$\boxed{(TRP) = 1 - FEP}$$

$$TRP = 1 - 0.35 = \mathbf{0.65}$$

c) Since TRP is the fraction of filtered phosphate that is reabsorbed, then provided a reasonable proportion is excreted in the urine i.e. the renal threshold is exceeded, multiplication of TRP by the plasma phosphate concentration gives the maximum rate of phosphate reabsorption per litre of glomerular filtrate (TmP/GFR):

i.e. $\boxed{TmP/GFR = TRP \times P_{PO4}}$

substitute: $TRP = 0.65$; $P_{PO4} = 0.52$ mmol/L

$$TmP/GFR = 0.65 \times 0.52 = \mathbf{0.34\ mmol/L\ glomerular\ filtrate}$$

This calculation is based on the assumption that TRP <0.86 and so the patient's values lie on the linear part of a plot of urinary phosphate excretion versus plasma phosphate.

Reference: Payne RB. Renal tubular reabsorption of phosphate (TmP/GFR): indications and interpretation. *Ann Clin Biochem* 1998; **35**: 201-206

Question 19

A patient's arterial blood results showed a P_{O_2} of 12 kPa, haemoglobin concentration of 150 g/L and an oxygen saturation of 98%. Calculate the total oxygen content of his blood in mL/L.

MRCPath May 1997

The Diggle Microbiology Challenge

These multiple-choice questions, set by Dr Mathew Diggle, are designed with Trainees in mind and will help with preparation for the Microbiology Part 1 FRCPath exam.

Question 28 from December's ACB News

True or False - Influenza A Virus:

A. May undergo antigenic shift and antigenic drift
B. May cause pandemics
C. Responds to rimantidine
D. Responds to neuraminidase inhibitors
E. Vaccination confers lifelong protection

Answer:
True - A, B, C & D
False - E

Question 29

The following is true of Coronaviruses:

A. SARS-coV-2 is the only coronavirus to cause disease in humans
B. There are currently four main sub-groupings of coronavirus
C. There are seven currently known coronaviruses that can infect people
D. Coronaviruses are spread mainly via respiratory droplets and small particles that contain the virus
E. Vaccines can be effective in either preventing or minimizing the effects of disease
F. Antibiotics are an effective way to treat Coronaviruses

The answer to Question 29 will appear in the next issue of ACB News – enjoy! ■

NICE CKD 203 guidelines – What next?

Alexandra Yates, Director of Scientific Affairs

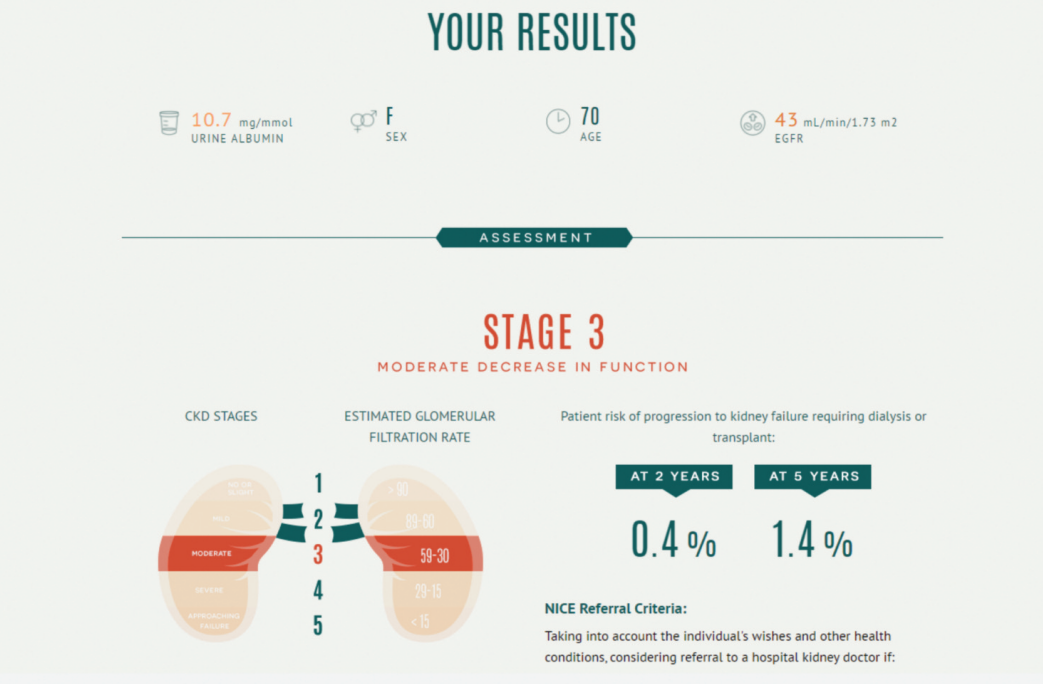
In August 2021 NICE published guidance on the assessment and management of Chronic Kidney Disease (CKD) for patients in England and Wales. This 74-page document with numerous pages of supplementary evidence brought together and updates previous guidance around anaemia, identification and management and hypophosphatemia in CKD and made some significant changes.

Two Chemical Pathologists were on the NICE Committee who reviewed this guidance, and ACB member Dr Grainnie Connolly has provided the ACB with a summary of laboratory specific points within the guidance which can be found on the **ACB website.**

The two main changes seen in the guidance were the recommendations on the use of the Kidney Failure Risk equation (KFRE) and the removal of the alteration of eGFR based on race of patients.

Kidney failure risk equation

Before publication the ACB were consulted around implementation of the KFRE, and we strongly expressed the numerous barriers to implementation, resulting in a subtle change in the wording around implementation. Since publication of NG 20, the ACB have formed a task force with NICE, GIRFT, UK NEQAS and the UK Kidney Association to aid the successful implementation of this equation both long term and in the interim.



Screen shot from https://kidneyfailurerisk.co.uk

The taskforce believe it is essential that initially before any implementation of the KFRE, ACB members should engage with local CKD clinical leads to find out if they are already using the KFRE. Do they even want to use the KFRE equation? Then work together on the patient pathway including Primary Care teams.

The CKD task force hope to engage with LIMS providers using a similar model to the implementation of the AKI algorithm to ensure users can have a standardised programme. In the interim, laboratories may set up their own systems in LIMs, middleware or end user systems but these obviously should be thoroughly tested as the equation is multifactorial with various different versions available in publication and on websites.

It is worth noting that the formula that should be used in the UK population is different from some previously published formulae and those found on non-UK based calculators. It is essential that the formula is taken directly from NICE guidance and the **https://kidneyfailurerisk.co.uk** website is used as an online calculator. It is also essential that the UK version identified by "co.uk" is used.

The task force would be extremely interested in hearing from any laboratories that implemented the KFRE in computer systems to learn from their experience first hand.

Removal of multiplication factor for Black, Asian or other minority ethnic patients

The removal of these recommendations is discussed in more detail **here**.

However, in summary the adaptation removes health inequalities that may have resulted based on historic non-UK based data, initially used in the establishment of the eGFR equation that did not account for the racial heterogeneity seen in the UK population and made assumption on muscle mass purely based on race.

It is recommended that any inbuilt calculations that may pull ethnicity data into the eGFR equation are disabled and comments suggesting the multiplication of eGFR due to race that laboratories may have introduced on the back of previous guidelines be removed. It may also be prudent to highlight this change to GPs. It should be noted at this time the NICE guidance is to use the CKD-Epi (2009) version of the formula to calculate eGFR, and that this is version of the formula that was used in the validation of the KFRE. ■

It is planned that summaries of laboratory medicine aspects of new NICE guidance will be produced by the Scientific and Clinical Practice Committee and added to the ACB website as a useful tool for members. This is in addition to our on-going role finding expertise to sit on relevant NICE guidance committees and responding to consultation on behalf of the ACB as Stakeholder.

UKPIN 2021: Immune health through life and COVID-19

Caroline Charlton, North Cumbria Integrated Care NHS Foundation Trust

The 2021 biennial UK Primary Immunodeficiency Network (UKPIN) conference was held at the beginning of November in the grand setting of Cutlers' Hall in Sheffield. After so many long months of virtual meetings it was great to be able to meet face-to-face again.

The conference began with a fantastic plenary session focussing on newborn screening and bone marrow transplantation. Professor Andrew Gennery and Dr Fiona Shackley provided an update on the newborn screening programme for severe combined immunodeficiencies (SCID), which was introduced at six sites in England in September 2021 as part of a two-year evaluation process. Dr Mary Slatter then discussed how the introduction of T cell receptor (TCR) αβ/CD19 graft depletion has dramatically improved outcomes for haploidentical stem cell transplant patients, requiring less toxic conditioning regimes and significantly reducing the risk of graft versus host disease (GvHD). Professor Emma Morris then rounded off the session with an overview of the current performance and considerations for stem cell transplantation in adults.

In the next session on novel therapies in Primary Immunodeficiency (PID), Dr Austen Worth gave a great overview of current and emerging targeted therapies to treat various inborn errors of immunity. Some of these conditions are characterised by over-activation of the JAK/STAT pathway, making them good candidates for treatment with small molecule JAK inhibitors. Dr Anita Chandra discussed the clinical presentation and treatments in activated phosphoinositide 3-kinase δ syndrome (APDS), including selective PI3Kδ inhibitors currently in trials. The session concluded with a short talk from Dr Manisha Ahuja presenting initial UK data on patient outcomes using Berotralstat (a plasma kallikrein inhibitor) for hereditary angioedema prophylaxis, demonstrating a promising reduction in frequency and severity of attacks.

An afternoon immunogenomics session highlighted the increasing role of genomics in the field of immunodeficiency and across the wider NHS, building on the success of the 100,000 genomes project. Dr Emma Baple provided an overview of the NHS Genomic Medicine Service (GMS) structure and role, and the clinical application of genomic technology to facilitate diagnosis and management of rare diseases was discussed by Professor Anthony Williams.

The final session of day one explored the impact of COVID-19 on patients with immunodeficiency; Professor Alex Richter presented data from an adult patient cohort from across the UK whilst Dr Elizabeth Whittaker focussed on paediatric PID patient outcomes. Adult data highlighted an increased risk of morbidity and mortality from COVID-19 compared to the general population, with

existing lymphopenia and older age particular risk factors. In contrast, UK data suggests no increased risk of severe COVID-19 illness in immunocompromised paediatric patients.

Day two included a Grand Round on the subject of anti-cytokine antibodies, with some interesting case presentations and discussion points. That was followed by the 'Great Debate' on whether immunoglobulin replacement should be preserved for immunodeficiency patients, with Professor Stephen Jolles arguing for and Dr Siraj Misbah against the motion. As always this session was both entertaining and thought-provoking, and strong arguments from both speakers divided opinion within the room on what is a difficult ethical dilemma.

In the afternoon, Professor Emma Morris gave an informative talk on CAR-T cell therapy and the risk of associated immune-mediated toxicity, including cytokine release syndrome and immune effector cell-associated neurotoxicity syndrome (ICANS). Professor Claire Booth then provided an update on the fantastic progress of gene therapy treatments for PID, with successful outcomes reported in ADA-SCID, X-linked chronic granulomatous disease and Wiskott-Aldrich syndrome, and trials in a number of other PIDs ongoing. A short oral presentation from Dr Adrian Shields returned to the subject of COVID-19, demonstrating reduced responsiveness to SARS-CoV-2 vaccination in patients receiving B cell depleting therapies.

The meeting finished with a final look at the 'legacy from COVID', highlighting some of the ways in which the COVID-19 pandemic has impacted our field, and the huge contribution the UK immunology community has made to the global fight against the SARS-CoV-2 virus.

Many thanks to the organisers for putting on a great meeting under challenging circumstances. It was lovely to be able to meet with colleagues from across the country after so long, and while there are some obvious benefits to remote meetings, I was grateful to be listening from somewhere other than my dining room table! ■

Sheffield, the venue for the 2021 UKPIN conference

15th International Congress on Paediatric Laboratory Medicine 2021

Charles van Heyningen, Biochemistry representative on the Prenatal, Perinatal and Paediatric Pathology Advisory Committee, Royal College of Pathologists

The latest Congress on Paediatric Laboratory Medicine was held as a virtual event in November 2021. It focused on emerging technologies for testing in children.

United Kingdom contributions came from Tim Lang, Chair of the Congress; Rachel Carling, Guy's and St Thomas' Hospital, London, who gave a presentation on machine learning for the automated interpretation of amino acid profiles; and Paediatrician Ruud Nijman, Imperial College, London, on the impact of COVID-19 in children.

Most of the presentations were from Germany and other European countries and other speakers were from Canada, South Africa, China and Chile.

Childhood aspects of COVID-19 that were described included the rare multi-system inflammatory syndrome and the recognition of long-term disease.

Mass spectrometry is increasingly used for newborn screening and steroid profiling.

Next generation genome sequencing is being used to screen for some inherited disorders and to investigate the gut microbiome in neonates.

Data mining (statistical analysis of historic laboratory data) is being used to generate laboratory reference values.

There were 28 posters mainly on biochemical aspects of Laboratory Medicine. The poster presentations were from across the world: seven from Spain, three each from Italy and Nigeria, and others from India, South Africa, Nepal, France, Turkey, Portugal, Australia, Chile, Russia, Pakistan, Norway, Germany and Slovenia. Poster topics included the use of mass spectrometry, biomarkers in COVID-19 infections, data mining for obtaining reference ranges and studies on inborn errors of metabolism.

Reference

Journal of Laboratory Medicine, volume 45, issue 6, December 2021

ICPLM 2021 – virtual edition

You can still register to have access to the platform that allows you to:

- Watch all sessions on demand
- Download a certificate of attendance
- **Download the "Special Issue" of *Journal of Laboratory Medicine*** (containing the papers of the ICPLM symposia and the poster abstracts), click "Latest Issue" button.

ACBI Annual Conference 2021 – Together, Apart

David Foley, Beaumont Hospital, Dublin, and Lucille Kavanagh, Mater Misericordiae University Hospital, Dublin

The 43rd Annual Conference of the Association of Clinical Biochemists in Ireland (ACBI) was held on 12th November 2021. For the first time in its history, the conference was held virtually, and proved a great success. A huge thanks is extended to the organising committee of Dr Seán Costelloe, Dr Ophelia Blake, Michéal Ryan, Kelly Foley, Dr Janice Reeves and, in particular, Alison Bransfield, Natividad Rico Rios and Dr Peadar McGing. The meeting would not have been possible without the support of the various sponsors: Abbott, BD, Beckman Coulter Diagnostics, Cruinn Diagnostics, Eurofins Biomis, Fannin Ltd, Labgnostics, and Roche Diagnostics.

The conference was opened by Dr Seán Costelloe, ACBI President and Conference Secretary, who gave an update on the work carried out by members during the year, with the additional burden of the COVID-19 pandemic and maintaining services through the 2021 cyberattack on the Irish Health Service Executive.

Session 1: Sepsis and Inflammation

The conference opened on the topics of inflammation and sepsis. Professor Colum Dunne of the University of Limerick (UL) discussed the innovations made by researchers working in UL's Centre for Interventions in Infection, Inflammation and Immunity, including developing a new confirmatory test for diagnosis and monitoring of Crohn's Disease or ulcerative colitis.

Next, Dr Michael O'Dwyer, Clinical Lead for the National Clinical Program for Sepsis in Ireland, gave us an update on identifying sepsis and discussed the role of pathology in diagnosing sepsis and monitoring response to treatment.

To close out the session, Dr Kate Honeyford, a chartered statistician working at the Global Digital Health Unit, Imperial College London, discussed her work in using routinely collected health care data to improve health outcomes. She presented her recent work, evaluating the impact of a digital sepsis alert on patient care across six National Health Service trusts.

Session 2: Subfertility

The first talk of this session was by Dr Rebeca Gomez Casaseca (Director of In Vitro Fertilisation [IVF] and Andrology Laboratory, Universitario La Paz), who presented on the investigation of the infertile couple. She provided an oversight of the various biochemical and other laboratory investigations patients at her hospital go through for infertility investigations.

Next, Dr John Waterstone (Medical Director, The Waterstone Clinic), presented on IVF and its applications. He spoke about the service available to patients in Ireland who seek IVF, and provided an indepth insight into the role scientists at his practice play in IVF, from fertilisation to storage of embryos.

The final talk in this session was by Professor Keelin O'Donoghue (Consultant Obstetrician, Cork University Maternity Hospital), who spoke about the investigation of recurrent miscarriage. She provided a comprehensive review of the various metabolic and endocrine

conditions associated with recurrent miscarriages, along with how these patients should be worked up and monitored during pregnancy.

Session 3: Members' papers and cases

The third session was of great interest to members as it was an opportunity for them to present clinical and scientific cases. Selected poster presentations showcased the excellent research and development work carried out by ACBI members. The conference medal winners were:

- 'Male pituitary-gonadal axis function in Obstructive Sleep Apnoea Syndrome – the effect of continuous positive airway pressure', presented by Richard Leigh *(Best Oral Presentation Medal in Non-Clinical Case)*
- 'Psychiatric presentation of inborn metabolic disorders in older children', presented by Dr Jennifer Brady and Patricia Fitzsimons *(ACBI Best Clinical Case Medal & ACBI Geraldine Roberts Medal)*
- 'Comparison of HbA1c measurement in remotely prepared capillary versus standard venous blood samples' presented by Wendy Groenendijk *(ACBI/UCD Clinical & Diagnostic Biochemistry Medal).*

This latter award is new, and recognises academic excellence in the first intake of students to University College Dublin's MSc in Clinical and Diagnostic Biochemistry (2019/2020). The course is now in its second year. This bespoke Master's degree is designed by professionals in Clinical Biochemistry, and the aim is to provide a solid grounding in scientific, technical and clinical knowledge required for a career as a Clinical Biochemist.

Following these presentations, there was an interactive session on internal quality control (IQC) practices and dilemmas, presented by members of the ACBI Trainee group: Karen Heverin and Jim Kelly, which provided an insight into practices in hospitals and tested the members' knowledge of Westgard rules and other IQC problems.

Session 4: Renal Medicine

The final session was opened by Dr Anne Dawnay (Consultant Clinical Biochemist, Barts Health NHS Trust), who spoke about point-of-care assessment of renal function. She offered insights into how using point-of-care instruments to assess eGFR can assess patients at high risk of contrast-induced nephropathy (CIN).

Next, Dr Ahad Abdalla (Consultant in Renal Medicine, University Hospital Limerick) spoke about renal transplantation, and offered an insight into the renal transplant service provided in Ireland, particularly the service offered outside of Dublin.

The final talk of this session, and of the conference, was by Dr Cynthia Delgado (Faculty of Medicine, University of California, San Francisco). Dr Delgado provided an overview of the National Kidney Foundation and the American Society of Nephrology (NKF-ASN) Task Force recommendations to adopt the eGFR 2021 CKD-EPI creatinine equation for estimating kidney function without race variables. She also advocated that Cystatin C should be combined with creatinine when estimating glomerular filtration rate.

As successful as this year's online conference was, fingers are crossed in the hope that members and colleagues from the United Kingdom and further afield will be able to meet up in person later in 2022 at the ACBI Annual Conference in Cork. ■

ASSOCIATION OF CLINICAL BIOCHEMISTS IN IRELAND

Trace Elements: West Midlands ACB Scientific Meeting in association with the SAS Trace Elements Laboratories

Dr Jonathan Fenn, 2nd Year Clinical Biochemistry STP Trainee, The Royal Wolverhampton NHS Trust

On 7th December 2021, healthcare professionals from around the country gathered in the heart of Birmingham City Centre for the Trace Elements: West Midlands ACB Scientific Meeting. This event was kindly sponsored by the Black Country Pathology Services, Randox, ThermoFisher Scientific, RSC Interest Group: Atomic Spectroscopy, QMX Laboratories, ESSLAB, PerkinElmer and SciMed. Representatives from these companies were in attendance.

It was fantastic to see so many people face-to-face, as well as those who joined us remotely. The day began with a warm welcome from the West Midlands ACB Chair, Pervaz Mohammed (Black Country Pathology Services). Trace elements is often a neglected area of Laboratory Medicine. This event, which had been almost three years in the planning/ arranging was a packed schedule comprising of interesting talks, discussions, and provided opportunities for networking.

Session One

The morning session was chaired by Dr Kishor Raja (Chair, SAS Trace Elements committee, King's College London). This session concentrated on essential trace elements, particularly copper and zinc, and included discussion on the applications and limitations of different analytical techniques.

Dr Nicola Barlow (SAS Trace Element Laboratory, Black Country Pathology Services) focused on the role of the laboratory in the assessment and monitoring of nutritional trace elements, including zinc, copper, selenium and manganese (concentrations measured in blood in suspected toxicity). These topics were explored through six clinical cases. One of the key points conveyed was how zinc and manganese, as abundant trace elements, are often artefactually raised due to contamination, highlighting the importance of sample collection in 'trace element free' tubes.

A case of zinc deficiency was described. It was noted that plasma zinc is a poor marker of zinc status and this can make the interpretation of low zinc difficult.

Both zinc and selenium can be depleted in critical illness as part of the acute phase response; therefore, low levels detected in critical illness are unlikely to accurately reflect the body status. A number of suggestions were presented to address these issues, including measurement of CRP, the use of lower cut-offs for true deficiency, correction for carrier proteins in zinc measurement, performing serial measurements, erythrocyte measurements, and the use of functional tests such as glutathione peroxidase.

Philip Crook (Viapath, King's College London) talked about a method evaluation of commercially available copper and zinc spectrophotometric assays, in comparison to ICP-MS. A clinical audit of zinc and copper deficiency in a post-bariatric surgery population was also covered.

ICP-MS is frequently used to measure copper and zinc; however, spectrophotometric assays have several advantages, including automation, integration with existing hardware and improved turnaround time. The disadvantages include sample preparation, contamination and use of third-party assays. Overall, spectrophotometric assays were found to have greater imprecision for copper at low concentrations when compared to ICP-MS. However, at low concentrations, zinc assays performed well. The possibility of using zinc spectrophotometric assays was discussed; however, proportional bias was identified in EQA samples, and therefore it was concluded that further materials and studies were needed.

In post-bariatric surgery populations, a varying prevalence of zinc and copper deficiency has been reported. Therefore, a clinical audit was conducted to assess the adherence of clinical practice in the management of these deficiencies. Zinc deficiency was found to be more prevalent than previously reported. It was suggested that spectrophotometric assays have the potential to improve the monitoring of zinc deficiencies as they show good agreement with ICP-MS.

Dr Chris Harrington's lab (SAS Trace Element Laboratory, Berkshire and Surrey Pathology Services) is part of the supra-regional assay service that provides specialist trace metal analysis and interpretation, and also oversees the UK NEQAS for Trace Elements external quality assessment scheme. The laboratory is also involved in trials for new Wilson's Disease immunotherapies, gene therapies and laboratory development. Recent developments explored the inadequacies of current testing methods for Wilson's disease diagnosis and monitoring. Current tests include total serum copper; however, this is a poor diagnostic test for Wilson's disease. A 24-hour urinary copper excretion is preferable for diagnosis; however, there are associated practical limitations. Caeruloplasmin can be measured by nephelometry-based immunoassays; however, these assays tend to overestimate caeruloplasmin. New copper tests under investigatation include exchangeable copper, relative exchangeable copper and the use of HPLC coupled to ICP-MS, to help improve the certainty of diagnosis. The ability to measure phosphorous and sulphur by triple quadrupole ICP-MS enables identification and measurement of copper-containing proteins. Ultimately, these developments could overcome the problem of over-estimation of caeruloplasmin by nephelometry-based immunoassays.[1]

Sponsor Presentations

This event was made possible through our sponsors. Five short presentations to update us on their latest developments were provided by personnel from ESSLAB, QMX Laboratories, PerkinElmer, ThermoFisher Scientific, and Randox.

Session Two

After lunch we began session two, chaired by Dr Nicola Barlow. The afternoon session focussed on clinical cases, with the recurring theme being the importance of testing for trace elements in patients with non-specific symptoms.

Dr Muhammed Elamin (Sandwell and West Birmingham NHS Hospital Trust) discussed a case of lead poisoning in an opium user who presented with poor communication. I.V. sodium calcium EDTA chelation therapy was initiated, which resulted in low zinc, and so supplementation was required. However, despite treatment, lead concentrations remained high and there was little clinical improvement. DMSA treatment was started, resulting in significant clinical improvement. Investigations revealed that the patient had become exposed to lead through adulteration of their opium.

A case of thallium sulphate poisoning several times above the normal lethal dose was also described. Thallium sulphate is often described as the 'poisoners poison', featuring in classic novels by Agatha Christie. The patient presented with tachycardia and neuropathy and was deemed unsuitable for haemodialysis treatment to remove thallium from the circulation. Prussian blue treatment was initiated; however, due to the pandemic pressures, the stocks were depleted before the thallium levels normalised. The only treatment option was daily activated charcoal. This was poorly tolerated by the patient, but miraculously, they survived.

A "red herring" case of suspected arsenic poisoning in a child was also presented. A very high urine total arsenic concentration was measured after the child had played with a non-CE-marked magnetic putty. This information went viral resulting in thousands of calls to the regional toxicology service. The putty was later found not to be the source. Fish fingers, which contain non-toxic arsenobetaine, were subsequently identified as the cause. This case highlights the importance of arsenic speciation when urine total arsenic is raised.

Dr Liz Fox (Leeds Teaching Hospitals NHS Trust) described a case of mercury poisoning, discovered through the use of ICP-MS. The patient initially presented with symptoms consistent with giant cell arteritis. Investigations refuted this diagnosis and the patient was found to have bilateral ganglion cell layer loss of the optic nerve. One of the most common causes of mercury poisoning is from ingestion of predatory fish, such as tuna, swordfish and shark. However, in this case the source of the mercury poisoning was found to be skin-lightening creams, now a recognised public health issue. The patient was advised to stop using skin-lightening creams and the mercury levels subsequently decreased over the following three to five months. Mercury is a powerful neurotoxin and produces its skin lightening effects by binding to tyrosinase and inhibiting melanin synthesis, but often the presentation is non-specific.

Dr Kishor Raja (SAS Trace Elements Laboratory, Viapath, King's College London) discussed the potential toxicity of gadolinium-based contrast media. Gadolinium is used in MRI imaging due to its paramagnetic properties, enabling improved tissue contrast. Linear molecular chelate forms of gadolinium can be especially toxic as the released Gd ion (due to similarities in ionic radii) can interfere with calcium-dependent processes, and can lead to nephrogenic systemic fibrosis in patients with impaired function. The current advice is to limit its usage in renal failure as gadolinium can be retained in the brain, kidneys and bone tissue. Further research is needed into the pharmacodynamic properties of

gadolinium contrasts in renally impaired patients.

Dr Katie Jones (Cardiff and Vale Trace Elements and Toxicology Laboratories) discussed the pre-analytical issues in zinc, copper and selenium measurement. Zinc is normally measured by ICP-MS in a panel along with copper and selenium. Zinc concentrations are high in red blood cells and delays in sample separation of more than one hour can lead to artificially raised plasma/serum zinc levels. Conversely, copper and selenium have been shown to be stable for 48 hours in unseparated blood samples. As alluded to previously, zinc is a common trace metal contaminant and can be found in the gel, the rubber cap and the O-ring of blood tubes. A tube comparison study was carried out and revealed zinc levels to be higher in serum separating tubes compared to trace element free tubes. To achieve accurate zinc measurements, it was therefore concluded that samples should be collected in 'trace element free tubes' and separated within two hours of venepuncture.

Dr John Wadsworth (Glasgow Royal Infirmary) described the interaction between zinc and copper metabolism. A patient taking solvazinc for zinc deficiency was found to have copper deficiency. Zinc supplementation was stopped and copper supplementation initiated. Subsequent testing revealed the copper to have normalised, whilst zinc was now low. Solvazinc was restarted by a different clinician and later copper was found to be low again. Zinc was stopped and copper supplements re-initiated. This is a lesson to us all to read the clinical notes and review previous results. Sixteen months later, the zinc and copper levels had normalised. Further investigation revealed that the patient had hypoalbuminaemia. Zinc is primarily albumin bound in plasma and therefore low albumin will result in low plasma zinc. Excessive zinc supplementation can lead to copper depletion by increasing metallothionine in enterocytes. Metallothionine preferentially chelates copper, resulting in its excretion. The potential use of a zinc-adjusted albumin equation was explored. Zinc concentrations do not need to be high to induce copper deficiency; therefore, interactions between these trace elements are important clinical considerations.

Session Three

The final session was chaired by Dr Jackie Morton (HSE Science and Research Centre,

Buxton). Helen Crabbe (UK Health Security Agency) explained the paediatric blood lead surveillance programme. Currently twelve UKAS accredited laboratories are involved in the programme. The objective is to support individual case management in children exposed to lead, as well as to provide a better understanding of the epidemiology, risk factors and exposure assessment to benefit public health.

Nicola Seaward (University Hospital Birmingham NHS Foundation Trust) discussed the use of ICP-MS in post-mortem toxicology. Although post-mortem toxicology analysis is primarily performed to investigate if single/combination of drugs may have contributed to the cause of death, using LC-QTOF-MS screening followed by confirmation, there is a role for ICP-MS analysis in cases where metal poisoning is suspected.

A case of cannabis toxicity revealed by the detection of cannabis metabolites was discussed. Raised blood cadmium and manganese levels were identified. A common source of cadmium exposure is from industry and cigarettes. Both manganese and cadmium can undergo post-mortem redistribution, confounding its interpretation. The use of survey scanning, which involves a rapid untargeted scan of all elements, was discussed. This case highlighted the challenges of post-mortem toxic metal screening and its interpretation.

Professor Andy Meharg (Queens University, Belfast) gave a presentation on arsenic exposure in rice. Rice is found to have 10 times higher arsenic levels compared to other crops due to the growing conditions; exposure increases the risk of cancer. The possible methods of removing arsenic from rice, such as using large volumes of water in cooking, citric acid and calcium carbonate treatment were discussed. Importantly, infants should not be fed rice due to the high levels of arsenic in combination with their lower body mass, making them especially susceptible to arsenic poisoning. Therefore, foods designed specifically for infants are important in this age group.[2]

The day concluded with closing remarks from Pervaz Mohammed. The Trace Elements Meeting was an especially busy day with a packed schedule covering numerous topics ranging from pre- and post-analytical aspects and technological developments to clinical cases and provided a number of key take home messages.
It was a great privilege to be able to attend this meeting and see so many of our colleague's face-to-face and I very much look forward to participating in future meetings.

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2 Shi Z, Carey M, Davidson E, Meharg C, Meharg AA. Avoiding rice-based cadmium and inorganic arsenic in infant diets through selection of products low in concentration of these contaminants. *Exposure and Health.* 2021 Jun; **13(2):** 229-35

Industry Insights: February 2022

Doris-Ann Williams, Chief Executive, BIVDA

Since Christmas there has been a lot of focus on why diagnostics for use in the pandemic – particularly lateral flow tests – have been purchased from overseas and not bought from UK manufacturing companies. The issue has been conflated with whether there were parties at 10 Downing Street by the opposition in their attempt to force the Prime Minister to resign. (He may have done so by the time this is being read but that's another issue!)

At the very start of the pandemic, the then Secretary of State for Health and Social Care made the public declaration that there wasn't a domestic diagnostics industry – which certainly dismayed and outraged members of BIVDA. We've come to understand that this was said both from a position of ignorance but also that the diagnostics industry was thought to include private testing laboratories, of which there were few, particularly offering services direct to the public. There now is an Association for the laboratory testing sector: **www.ltio.org.uk**

It was also clear that although we pioneered lateral flow technology in the UK and had a strong manufacturing base, the companies were not geared up to the capacity estimated to be required by the population to monitor and manage coronavirus infection through self-isolation etc. The Government were also looking at home grown innovation for other aspects of COVID-19 testing

including POC PCR and alternative rapid technologies to deploy as triage for people coming into healthcare settings for treatment.

What has happened is that a number of companies were convinced and supported by Government to increase their manufacturing capacity to meet projected needs but subsequently left without orders as procurement decisions were made on a parallel track. There were a variety of complex contracts which are or will be subject to legal process but the general outcome is that UK manufacturers have been badly affected and the UK businesses of many global companies (who also form the mosaic we need to meet our country's health needs) were also overlooked to some extent. Much of this has been discounted by Government spokespeople as companies 'whining' which is grossly unfair to an industry motivated to be part of the national solution.

BIVDA is now working on a three-part project – firstly to address any media statements and political debate about lack of capability within the UK. We are also looking at whether there were legal improprieties with legal support which is a process being led by Helen Dent, BIVDA COO. Finally, we are commissioning an independent report into the pandemic from a diagnostics industry point of view so we can ensure lessons learned are documented and importantly have an action plan should we ever face issues of this type again either from a future pandemic or an outbreak of an infectious disease in this country.

We'd welcome any input from individuals as well as reaching out to the ACB and the other pathology bodies to form part of this report. Industry and the NHS work so closely to provide a world class service and it's critical that our combined voices are recognised and listened to in the future. ■

ACB News Crossword

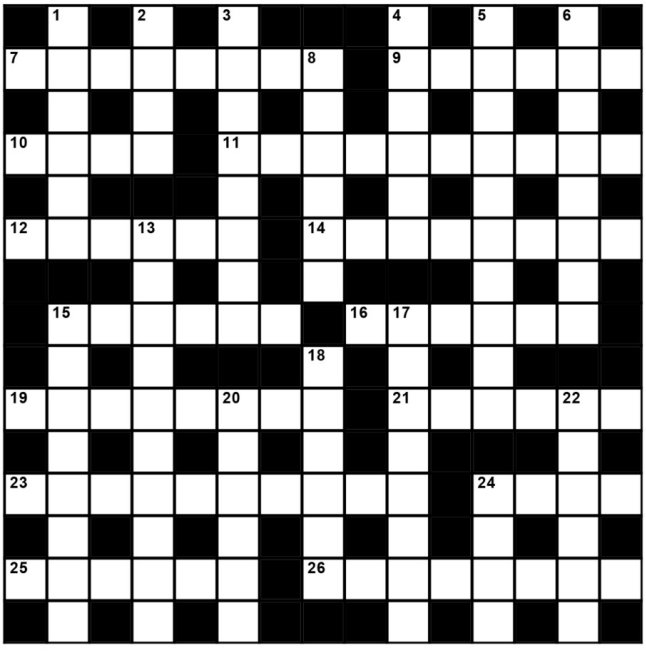
Set by Rugosa

Across

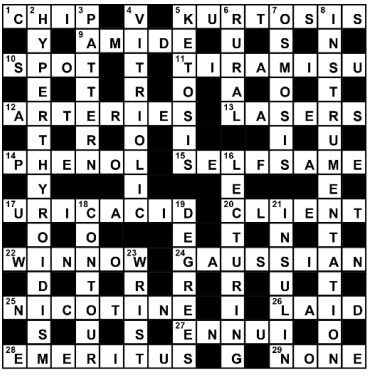
7 Alcoholic's deficiency condition? (8)
9 Concerning lower back, correcting measurably not easy (6)
10 Prepare plasma for politician's doctor (4)
11 Mistakenly incinerate diagnostically useful metabolic end product (10)
12 Signed off unregistered conduit (6)
14 Do-it-yourself stall set up far from the centre (8)
15 Re-educate – eat less (6)
16 Clarify concerning financial penalty (6)
19 Evaluation carried out by student in assay development (8)
21 Sit-ins used to take a very firm stand (6)
23 Same test as ordered for some consequences of cancer (10)
24 Document data (4)
25 Suture ensured vessel held (6)
26 Favourable condition for a gland (8)

Down

1 Conductor of new space probe leaving base (6)
2 Kind of club forming part of the social environment (4)
3 Containing quicksilver in the divalent state (8)
4 Criticises roofing materials (6)
5 Biochemicals could treat penniless dipsomaniacs (5,5)
6 Surgical tubes, unclean after first use (8)
8 Surrenders crops (6)
13 One can became a bore when spate is restricted (5,5)
15 Second in a race to the top? (6-2)
17 First emergency operation for discharge (8)
18 Finishes acupressure treatment when carer is absent (4,2)
20 Protest methods of some motorway transit insurrectionists (3-3)
22 Substance dissolved in absolute alcohol (6)
24 Their blood levels could be reduced by taking breaks from breakfasts (4)



Solution for December Crossword



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