ACB News

The Association for Clinical Biochemistry & Laboratory Medicine | Issue 686 | December 2023

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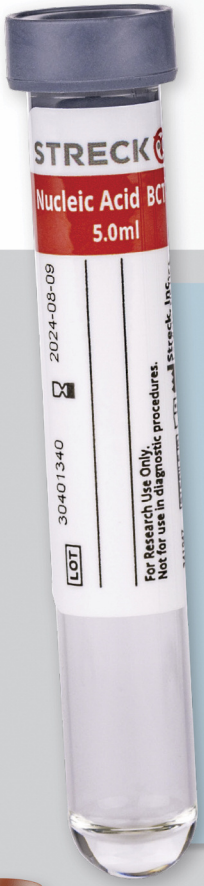

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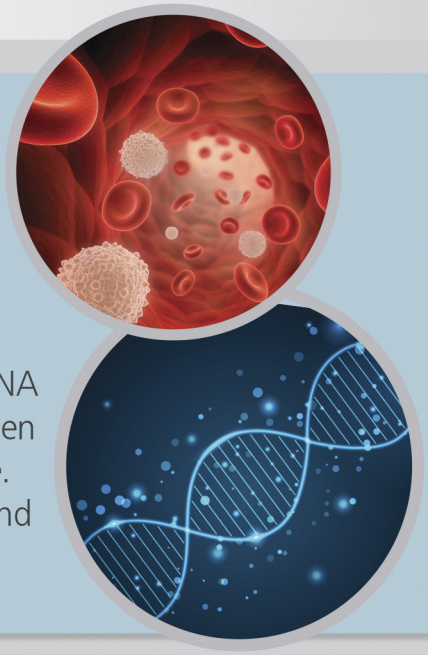

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ACB News

The bi-monthly magazine for clinical science

Issue 686 • December 2023

The Association for Clinical Biochemistry & Laboratory Medicine

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Front cover: Professor Anne Green, Mr Trevor Jones and Professor Anita McDonald

Message from the President

Welcome to the final edition of *ACB News* for 2023. What a year it has been – a year of change here at the ACB with me becoming President, Victoria Logan joining us as our new CEO and new staff members at the London office. Our thanks, of course, go to our out-going team – Bernie Croal and Jane Pritchard. I look forward to working with Bernie over the coming year in his new role as President of the RCPath.

On a much sadder note, we also had the passing of a past ACB President Professor Vincent Marks and, very recently, Emma Lewis, ACB Director of Regulatory Affairs. Their contributions to the Association cannot be measured and we will miss them dearly.

There have been many highlights this year, so many that it's been hard to narrow them down, but I would like to mention a few in particular.

Our meetings, both national and regional, are always a highlight and this year we were really spoiled. Our fantastic UKMedLab23 took place in Leeds in the summer where I got to meet many of our members in person. Thanks as always to the team that made it possible – led by Sarah Robinson and Tamsin Lawson. I'm already looking forward to the 2024 meeting in Brighton. This year we also had our inaugural Laboratory Medicine Leaders' Summit which took place alongside the IBMS Congress. You can read more about it later in this issue. We also had a full programme of regional and training meetings – with a balance of virtual and in-person meetings proving popular.

In September, a letter was sent jointly from myself along with the Presidents of IBMS, RCPath and the Chair of the RCGP to The Rt Hon Steve Barclay MP on the marketing of laboratory tests directly to

the public. This collaborative letter highlighted the patient safety issues created by unregulated diagnostic tests and testing kits. We stressed that whilst recognising that the use of self-testing kits for monitoring long-term conditions has an evidence base, the unregulated diagnostic testing market frequently lacks quality assurance and provides test data without professional support, leading to an increased burden on primary care to repeat any abnormal findings and provide appropriate interpretation. We recently had his reply assuring us that the government was committed to ensuring regulation keeps pace with the market.

As the year comes to a close, I'd like to thank our industry partners and collaborators who have supported us during the year. This includes our strategic partner, Abbott; and UKMedLab23 sponsors Abbott, BD, Beckman Coulter, The Binding Site, BIOHIT Healthcare, Chromsystems, QuidelOrtho, Randox, Sebia, Siemens and X-Lab.

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Our Strategy review at the end of 2023 identified the priorities for the next year and amongst other issues we are focussed on the continuing workforce challenges for our profession, adapting to the rapid changes in patient self-testing and results direct to patients, and preparing for the impact of AI and machine-learning in our sector.

And our change doesn't stop at the end of 2023. We have a busy year ahead – many of you will know we are rebranding early in the New Year. We will be changing our name to the **Association for Laboratory Medicine**, as agreed at the AGM in June, and will be unveiling our new logo. This will bring in an exciting new chapter in our Association's history and better reflect the breadth of our membership and activities.

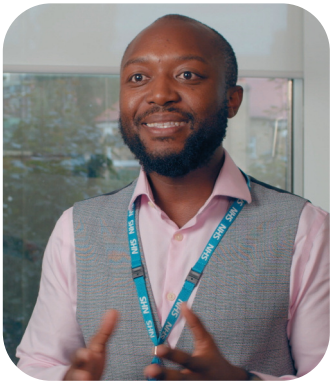
I would like to thank all of our Members for your interest, continued hard work in developing science to improve patient care, and for your on-going support for the Association, and to end on a positive note, I can confirm the good news, that in a year of financial pressures in the UK, we have decided to freeze our member fees for the coming year.

So, from me and all the ACB team, we hope you find time to relax with family and friends over the holiday season and wish you a very happy and healthy New Year! ■

Kath Hayden, ACB President

Meet our new ACB EDI Champion

As I embark on the role as your EDI Champion, I am both honoured and thrilled knowing that I come to support a team and membership committed to fostering a culture of inclusion, celebrating differences and continuous learning.



As I align myself with the ACB's visionary mission, my purpose is clear: to elevate the prominence of Equality, Diversity and Inclusion (EDI) in our collective consciousness, thereby shaping a community that thrives on inclusivity, delivering better quality patient care.

Just as diagnostics is indispensable to patient care, the integration of diverse perspectives is equally vital to ensuring our community realises its full potential. My commitment extends to deepening the understanding of how EDI initiatives contribute not only to the well-being of our members but also to the overall strength and vitality of our Lab Med family. The importance of inclusivity cannot be overstated, especially in our efforts to serve an ever-diverse patient cohort. It is imperative that we permeate inclusivity into our design, operation, and delivery, for our solutions to be truly representative and effective. Without this inclusive approach, our initiatives risk falling short of resonating with the diverse populations we are dedicated to serving.

Drawing on my experience as the chair of a staff side network, I recognise the transformative agency these networks hold in supporting organisational change. My encouragement to all is simple: be the change you wish to see in the world. The journey towards greater inclusivity begins with each one of us, and I am eager to champion this cause with you, fostering a more inclusive, dynamic and thriving ACB. ■

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Welcome to the December issue!

In this last issue of 2023, our President reflecs on the last 12 months and looks ahead at what 2024 might bring for the Association. We have the second installment of our new ACB Green Champions column, hosted by the ACB Green Champions Group, and our third Future Perspectives column article on 'defining diversity in biochemistry'. We hope they bring some new ideas and inspiration for your pathology services. As well as looking forward, we also travel back in time with Howard Worth in our 'I remember when...' column and with the very entertaining Peadar McGing in the final instalment of highlights from UKMedLab23 – the veteran's view of UKMedLab (formerly known as Focus) over the years. This was originally published in the ACBI newsletter but Peadar has kindly given permission for us to reproduce it here – thank you Peadar.

Birmingham Children's Hospital have sent an article that they would like us to share with our Members on the official unveiling of a plaque dedicated to the pioneering Clinical Biochemist Dr Evelyn Hickmans. Additionally, we have updates on the UK Kidney Association AKI SIG meeting, the IBMS Leadership Summit and the Awardees of the ACB Research and Innovation Grant.

Of course, we have all the regular features too! If there is anything else you would like to see featured in *ACB News*, please do let us know. We welcome feedback from our Members so drop us a line at at editor.acbnews@acb.org.uk

Condolences

It is with great sadness that we have been informed of the following deaths.

ACB Honorary Member and Past President **Professor Vincent Marks** passed away last month, aged 93. Professor Marks joined the ACB in 1958 and held many roles at the ACB over the years, including President (1989-1990), Secretary (1968-1969), Chair of the Publications Committee (1974-1977), Editor-in-Chief of the *Annals of Clinical Biochemistry* (1981-1985) and Secretary of the SE&SW region (1966-1967).

Emma Lewis, our Director of Regulatory Affairs/Chair of the Federation of Clinical Scientists, passed away on 14 November after a short illness. Emma was FCS Regional Representative for the North West (2012-) and prior to the above leadership role with the Association/ Federation, she was FCS Secretary (2013-2018), FCS Member on the Education Committee (2007-2019) and FCS Member on the Workforce Advisory Committee (2008-2019). Emma also used her time, generous nature and expertise to help numerous Members with various industrial relations concerns over the years as well as being our representative at a national level. Emma leaves behind her husband Mike, children Sophie and Adam and colleagues and friends at the Countess of Chester Hospital and beyond. She was a pleasure to work with, always kind and supportive, and will be hugely missed by us all.

ACB Honorary Member **Professor Jocelyn Hicks** passed away on 7 October 2023, aged 86. Professor Hicks joined the ACB in 1977 and was based Overseas (New York). Professor Hicks was a Past President of the AACC (now ADLM) and amongst many other roles was IFCC President (2006-2008). We send our sincere condolences to family, friends and past colleagues at this time and will update you when we are aware of details of any memorial services.

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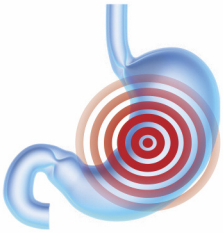

New rapid test to triage gastroscopy referrals

Atrophic gastritis is chronic stomach condition that is a priority for gastroscopy referral and endoscopic surveillance based on an incresed risk of gastric adenocarcinoma. It is also associated with iron deficiency anaemia (IDA), pernicious anaemia (PA), and nutrient deficiencies.

GastroPanel Quick Test NT identifies atrophic gastritis before endoscopy, enabling patients awaiting referral to be triaged based on risk. Testing dyspeptic patients using GastroPanel® can help to identify or rule-out atrophic gastritis to alleviate patient concerns and waiting list pressures associated with gastroscopy referrals, by aligning clinical resources with patients' needs.

- Select cases for gastroscopy according to risk
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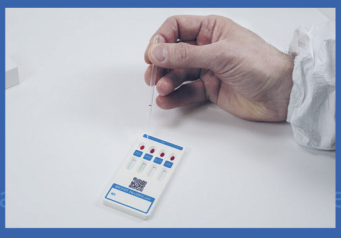
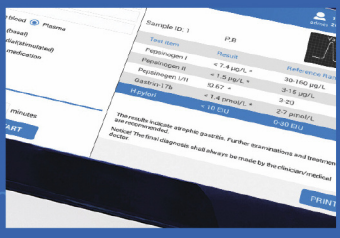
- Investigate the cause of IDA, PA, and nutrient deficiencies
- Ease the burden on overstretched gastroscopy services
- Finger-prick whole blood sample (POCT) or EDTA plasma (Lab)





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ACB Research and Innovation grant awardees

The SACP Committee is delighted to announce the following recipients of the 2023 ACB Research and Innovation grants.

- **Rebecca Stead, University Hospitals Dorset**
  Prognostic Markers for Gestational Diabetes
  "The ACB Research and Innovation Grant represents an essential springboard for furthering research I have been passionate about for nearly 15 years. This project is close to my heart and I hope it will revolutionise recognising and managing gestational diabetes to improve mother and baby outcomes."
- **Richard Barton and Clare Berry, Leeds Teaching Hospitals NHS Trust**
  Comparison of Pneumocystis jirovecii PCR on blood and bronchoscopy samples from hospital inpatients with suspected Pneumocystis pneumonia
  "We are delighted to have been awarded the ACB Research and Innovation grant to develop services for the better diagnosis of Pneumocystis. In our practice we are constantly seeing patients who might benefit from a blood-based diagnostic approach to diagnose this condition."
- **Magdalena Karlikowska, CEO, Cytecom**
  Exploring optical electrophysiology feasibility for rapid antimicrobial susceptibility testing to enhance urinary tract infection management

Annually, the Scientific Affairs and Clinical Practice (SACP) Committee is responsible for awarding ACB Research and Innovation Grants. In 2023, the grants were open to all Ordinary ACB Members. In 2023, funds of up to £20,000 were available for the grants, with a top limit of £8,000 that could be requested per application. Applications were open between June and August and were discussed at the September 2023 SACP Committee meeting. The SACP Committee encouraged applications that promoted the ACB's Five-Year Plan, centring on Innovation, Environment and Inclusion. ■

Rebecca Stead

Clare Berry and Richard Barton

ACB welcomes new members

The ACB is proud to introduce the following new members who have joined us since the last edition of *ACB News.* Please extend a warm welcome to:

- Miss Georgina Lynch, Trainee Clinical Scientist, Microbiology, Royal Lancaster Infirmary, Lancaster
- Mr David McClelland, Trainee Clinical Scientist, Clinical Biochemistry, Belfast Health & Social Care Trust, Belfast
- Miss Kathryn Dent, Biomedical Scientist, Clinical Biochemistry, The Newcastle Upon Tyne Hospitals NHS Foundation Trust, Newcastle Upon Tyne
- Miss Eleanor Finnie, Trainee Clinical Scientist, Microbiology, UK Health Security Agency (UKHSA), Birmingham
- Miss Danielle Purewal, Trainee Clinical Biochemist, Clinical Biochemistry, Imperial College Healthcare NHS Trust, London
- Miss Karen Adler, Student, University of Leicester, Leicester
- Dr Ailsa Hamilton, Chemical Pathology Trainee, Blood Sciences, NHS Tayside, Dundee
- Mr Samuel Brown, Trainee Clinical Scientist, Clinical Biochemistry, University Hospital Bristol and Weston NHS Foundation Trust, Bristol
- Dr Prabha Sanjeewani, Speciality Registrar, Clinical Biochemistry, King's College Hospital, London
- Ms Anila Hashmi, Medical Scientist, Pathology, NSW Health Pathology, Sydney, Australia
- Miss Katie Barnett, Trainee Clinical Scientist (Biochemistry), Department of Biochemistry and Immunology, Cardiff & Vale NHS Trust, Cardiff
- Miss Fasiha Pirzada, Student, University of Roehampton, London
- Miss Angelica Almeida, Student, University of Exeter, Exeter
- Miss Nojika Selvapragash, Student, Imperial College London, London
- Dr Koukab Al Farsi, Clinical Biochemistry Specialist, Clinical Biochemistry Department, Sultan Qaboos University Hospital, Al Khoudh, Oman
- Mr David Conway, Trainee Clinical Scientist, Biochemistry, East Kent Hospitals NHS Trust, Ashford
- Prof Seshadri Vasan, Director, Research and Development, Aberdeen Royal Infirmary, Aberdeen
- Miss Elizabeth Arthan, Trainee Clinical Scientist, Clinical Biochemistry, North Bristol NHS Trust, Bristol
- Dr Gareth Ashworth, Trainee Clinical Scientist, Microbiology, Portsmouth Hospitals NHS Trust, Cosham
- Mr Mark Bumstead, Trainee Clinical Scientist (Biochemistry), Pathology, Hampshire Hospitals NHS Foundation Trust, Basingstoke
- Miss Louise Caprani, Trainee Healthcare Scientist, Pathology, Royal Surrey NHS Foundation Trust, Surrey
- Miss Olivia Copeland, Trainee Clinical Scientist, Microbiology, Lancashire ■

UK Kidney Association Acute Kidney Injury National Strategy Meeting

Rachel Marrington, Deputy Director of Birmingham Quality (UK NEQAS), University Hospitals Birmingham NHS Foundation Trust; Anna L Barton, Principal Clinical Biochemist, Royal Cornwall Hospital (ACB representative to the UKKA)

The UK Kidney Association (UKKA) Acute Kidney Injury (AKI) Special Interest Group (SIG) held the first UKKA AKI National Strategy meeting day on 26 September in Birmingham. Three years in the making, delayed thanks to COVID-19, with the clear objective to create a strategy going forward for better identification of AKI and management of patients (short- and long-term), right through to education of both healthcare staff and patients. The meeting brought together representatives from many NHS professions and disciplines, from both secondary and primary care, reflective of the fact that AKI is not a problem just for nephrologists, but for all healthcare staff who are actively involved. We were invited as representatives of UK NEQAS (Rachel) and the ACB (Anna), as well as to present a talk on 'National recommendations to standardise laboratory AKI detection and response'.

The Chair of the AKI SIG, Jonathan Murray, Consultant Nephrologist, opened the session by reiterating that AKI is a heterogeneous clinical syndrome (Figure 1) and a national strategy for AKI is a national priority (Figure 2). There are challenges across all sectors, be it within laboratories with regard to identification of AKI, to patient management in primary

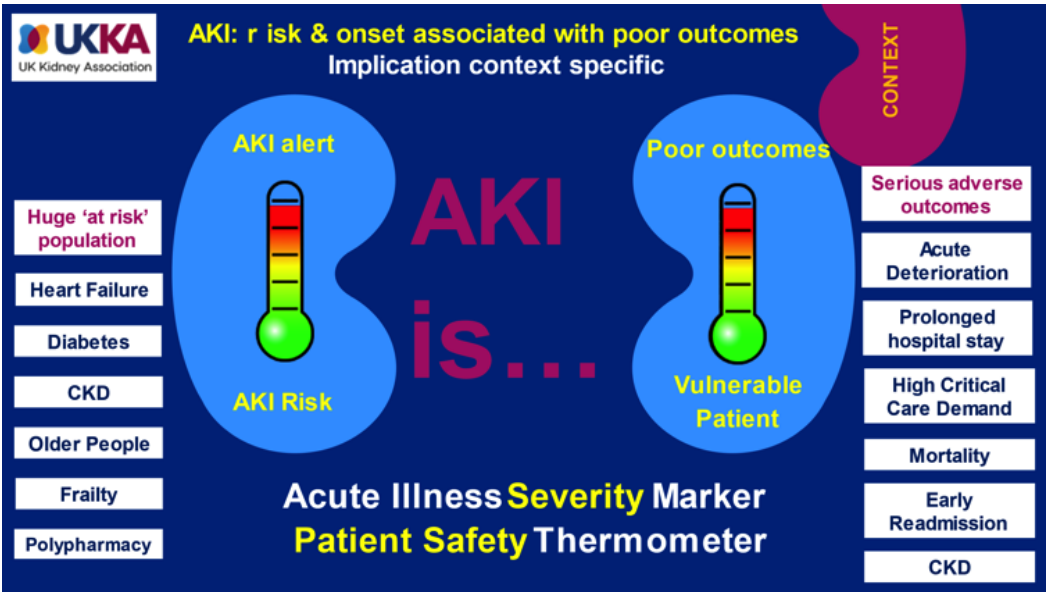

Figure 1: The risk factors for and adverse outcome of AKI (slide kindly provided by Dr M Jonathan Murray from his talk)

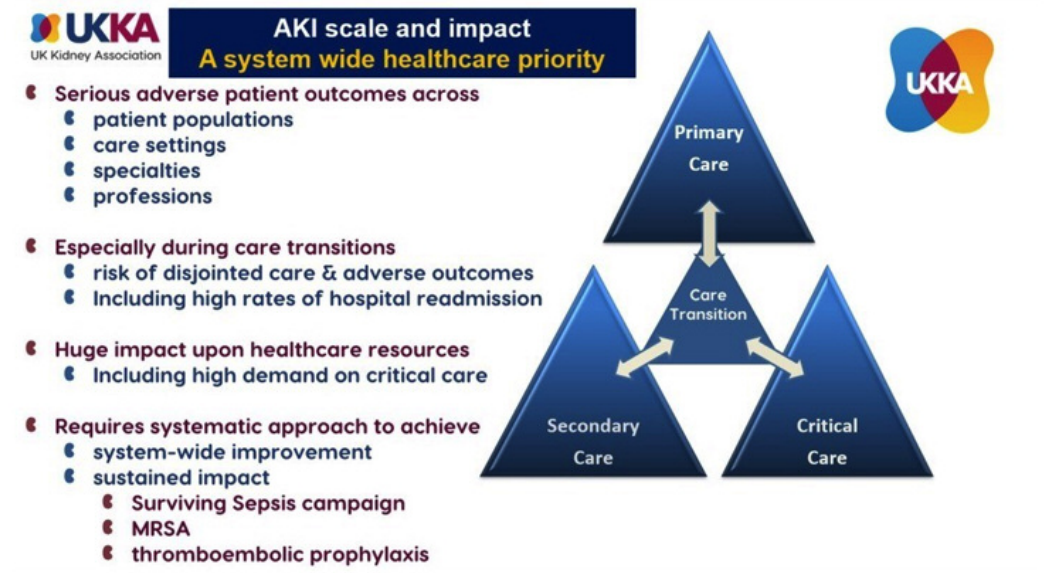

Figure 2: The impact of AKI and the need for a national strategy (slide kindly provided by Dr M Jonathan Murray from his talk)

and secondary care, and understanding of AKI in general. There are lots of opportunities that will allow us to standardise care, reduce inequality to access of services and reduce unwarranted variation in AKI identification and management. He used the national campaign on sepsis as an example. If you ask a room full of NHS professionals about sepsis they could easily answer the question and provide the well known acronym 'sepsis-six'. Do the same for AKI, and for many there would be blank faces or the response would be to 'contact the renal team'. However, with risk factors for AKI spanning multiple patient groups, that AKI can occur at any age any location, and has long term implications; like sepsis, AKI needs to be in the minds of the wider healthcare profession. It's not just a 'renal problem' and an AKI version of 'sepsis-six' to aid prompt identification and management would be of great benefit.

Since the issuing of the national safety alert in 2014[1] and the publication of the national AKI algorithm[2] much work and progress has been achieved, but there is still a misunderstanding of AKI and unwarranted variation. In 2021, UK NEQAS included AKI within their UK NEQAS for Acute and Chronic Kidney Disease Scheme and in the same year the AKI Taskforce was formed, a collaboration between GIRFT, ACB, UK NEQAS and UKKA.[3] The AKI Taskforce performed the national AKI audit in 2021 and published ten national recommendations in response to the findings.[4] In the opening session of the AKI summit, we presented our talk on 'National recommendations to standardise laboratory AKI detection and response'. Rachel showed data from EQA on AKI and there was still amazement that there is such a variation in creatinine results between methods, which, as pointed out by an audience member, could lead to more confusion about AKI as datasets are pulled together, either at a laboratory network level, or at a renal regional level. Anna presented a summary of the key

findings of the national AKI audit and linked these in with the ten recommendations, as well as providing a 'final thoughts' slide on future work on AKI & the laboratory, and the hope for future collaboration between the UKKA and the ACB.

The AKI Taskforce recommendations have been incorporated into the Renal Service Transformation Programme (RSTP) where the aim is to develop an integrated learning system. Nitin Kohle (NHS England National Clinical Advisor for Acute Kidney Injury) presented a summary of the five workstreams and laboratories that fall within the 'Quality Strategy in Detection of AKI'. There is a huge drive for transformation and defined requirements will be included within specifications which should assist laboratories with business cases for changing creatinine assays and/or LIMS.

The challenges of AKI were presented by leading experts within six short presentations. It was very clear to see that the current practices are not fit for the patient, whether it is a delay in AKI results being communicated to primary care, or the patient's management once they present to the Emergency Department, when admitted to secondary care or once they have been discharged. It is up to us to cultivate local networks and improve awareness and service delivery to tackle the fragmentation that appears to be system wide. During the afternoon, nine parallel workshops were held covering prescribing medications, IV contrast, fluid management, heart failure, the AKI multi-disciplinary team, patient transfers, post-discharge care, AKI awareness and education. The discussions and outcomes will be written up as a 'post summit' report with a series of recommendations which will hopefully lead to the transformation of AKI services.

References

1 NHS England National Patient Safety Alert. Stage three: directive standardising the early identification of acute kidney Injury. **https://www.england.nhs.uk/patientsafety/wp-content/uploads/sites/32/2014/06/psa-aki2.pdf**

2 Algorithm for detecting Acute Repeat Kidney Injury (AKI) based on serum creatinine changes with time. **https://www.england.nhs.uk/wp-content/uploads/2014/06/psa-aki-alg.pdf**

3 National recommendations to standardise acute kidney injury detection and alerting. Rachel Marrington, Anna L Barton, Alexandra Yates, William McKane, Nicholas M Selby, Jonathan S Murray, James F Medcalf, Finlay MacKenzie and Martin Myers. *Annals of Clinical Biochemistry* **https://doi.org/10.1177/00045632231180403**

4 Anna L Barton, Rachel Marrington, William McKane & Martin Myers. Taking a fresh look at acute kidney injury reporting. *ACB News*, Issue 673, pages 30-32, October 2022

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Stars

Mike Hallworth, Royal Shrewsbury Hospital, Shrewsbury (retired)

This poem was written for UK National Poetry Day, 2012. The theme was "stars" and the Royal Shrewsbury Hospital invited contributions from the various wards and departments about their stars.

A massive luminous plasma sphere,
By gravity made to cohere".[1]
Thus Wikipedia dubs a star
(the sort that twinkle from afar).

But other stars are nearer found –
The hospital with them abounds
And none so bright as those you'll see
At work down in Pathology.

Each day (and night) this expert crew
Test blood and wee and lumps and poo
C&S, FBC, biopsy and LFTs
We probe the causes of disease.

We tell you if your theatre's clean
Or if there's cancer in the spleen.
We look at things that can't be seen
At cells and molecules and genes.

We'll diagnose a heart attack,
Keep diabetics on the track
And, when the blood group we've perused,
We'll send you blood to be transfused

We'll grow and name your patient's bugs
And recommend the proper drugs.
Suspect a tumour? - that's routine.
We're the stars who stage and screen!

So when you next send tube or pot
Just pause and spare a passing thought
For Path Lab stars who, out of view,
Are shining brilliantly for you.

[1] This quotation is adaped from "Star" at Wikipedia (http://en.wikipedia.org/wiki/Star). ■

Events update

We've had an incredibly busy November, with four in person events and two online.

The South West and Wessex online event on 3 November had a record number of participants, with 280 registered and a waiting list, and over 190 joining to listen in live. At the time of going to press, bookings were still open for the Wales online event and numbers were at 157.

The National Audit Day and Trainees Day, both in London, were incredibly well attended too. Please look out for reports in the next issue of *ACB News*, along with follow ups from the ACB Scotland Regional Scientific Meeting and West Midlands in association with MetbioNet.

For upcoming events, please keep an eye on the website ■

Publication Deadlines

To guarantee publication, please submit your article by the 1st of the preceding month (i.e. 1 January for February 2024 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.

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‘Desert Island Papers’ on diabetes research in the UK relevant to Clinical Scientists and Statisticians

S E Manley, I M Stratton and A Karwath on behalf of Diabetes Translational Research Group, Queen Elizabeth Hospital Birmingham; S Ghosh, G V Gkoutos, S D Luzio, S Mostafa, R P Raghavan, G A Roberts, R A Round, J Webber, C Webster and J A Williams

How do Clinical Scientists, Biochemists, Health Data Scientists and Statisticians contribute to medical research in the UK? And where are they based? How well are they recognised and are they rewarded for their expertise? How are their careers structured?

We were delighted to accept the invitation from the *ACB News* Editor to select eight ‘Desert Island Papers’ on diabetes research in the UK to illuminate these questions. The papers have been published over the last 30 years, between 1994 and 2023, by diabetes research teams in laboratories situated in the Department of Medicine at Oxford University in the Radcliffe Infirmary, an Oxford Hospital, Pathology Laboratories at Queen Elizabeth Hospital Birmingham (QEHB) in collaboration with the Diabetes Centre and the Institute of Translational Medicine at the University of Birmingham.

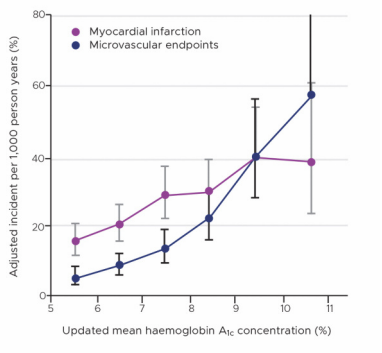
The United Kingdom Prospective Diabetes Study (UKPDS) was a randomised, controlled clinical trial involving people newly diagnosed with type 2 diabetes. It reflects the Diabetes Control and Complications Trial (DCCT) performed on type 1 diabetes in the USA.

The UKPDS was based in Oxford with 23 hospital centres around the UK including Birmingham. This internationally recognised trial featured on the cover of the September 2013 issue of *Diabetologia*.

We will start with an introductory UKPDS paper published in *Diabetic Medicine* in 1994 describing the characteristics of the 5,102 clinical trial participants, split by ethnicity. This paper is still topical given the worse outcomes of the COVID-19 pandemic on Asian and Afro-Caribbean patients plus the additional risks in patients with type 2 diabetes. At diagnosis of type 2 diabetes based on fasting glucose, there were no differences in the prevalence of complications between White Caucasian, South Asian and Afro-Caribbean patients although differences were found in other clinical and biochemical variables. The latter two groups were considerably younger than White Caucasians. Overall, body mass index (BMI) was lower and HbA_{1c} higher than in those people diagnosed currently.

This randomised controlled trial was started in 1979 and as it progressed the question arose as to whether laboratory methodology should be updated when better assays became available. The next paper we have chosen was published in *Clinical Chemistry* in 1997. It describes how to assess whether various methods for an analyte give different results, introduce new methodology, update databases with ‘shadow’ fields and identify any differences in historical data. One such difference was observed in early UKPDS triglyceride data and was confirmed by internal quality control. As digital medicine involves combining data sets from many different sources, it is essential

to determine whether measurements are comparable as hospitals may have their own reference ranges.



And so on to paper number three, one of the most iconic UKPDS papers, published in 2000 by the *British Medical Journal*, and still regularly displayed at international diabetes meetings.

This pivotal graph shows that updated HbA_{1c} – instituted by the UKPDS Statistician and Biochemist and representative of the time a patient was in the randomised controlled trial – is related to the complications of the disease. The differing slopes and timescales for the development of microvascular and macrovascular complications of diabetes have influenced clinical practice and prevented blindness and other complications in patients.

Another important factor for the presentation of UKPDS data was how comparable it would be to results from other pathology laboratories and, of course, the DCCT. When at the 1997 American Diabetes Association (ADA) meeting in Atlanta, Sue Manley and Irene Stratton embarked on a train journey to the Centers for Disease Control and Prevention to find out about reference methods for glucose and cholesterol. By coincidence, the scientists involved in the DCCT, Dr Randie Little and Hsiao-Mei Wiedmeyer, were also visiting that day and we were introduced to them over lunch! So, we ensured that UKPDS HbA_{1c} data was equivalent to the DCCT. The Oxford laboratory was certified by the National Glycohemoglobin Standardisation Program (with which Sue Manley has an ongoing connection). In addition, the Oxford laboratories were inspected regularly by Dr Iain Ross and Janet Smith to ensure they were run in the same manner as NHS laboratories given the similarity of the research workload to a District General Hospital.

Now, we move on to the Pathology Laboratories at University Hospitals Birmingham NHS Foundation Trust in the West Midlands where the ex UKPDS Clinical Scientist was given a day a week to translate its findings into clinical practice and initiate diabetes research within the NHS.

Insulin measurement has been part of the Clinical Scientist's research life from Bristol University days when Professor Philip Randle accessed insulin assay components from Professor Nick Hales in Cardiff in the early 70s, not long after Yalow and Berson established the radioactive immunoassay for insulin.

Given the interest in insulin measurement by Dr Penny Clark and lack of a reference method, we embarked on a comparison of different insulin assays (paper four) showing how homeostatic model assessment (HOMA) of insulin resistance (IR) and insulin sensitivity (IS) could differ by a factor of two depending on which insulin assay was used (paper five). Searching the internet recently for information about insulin unearthed an international lecture featuring data from this *Diabetes Care* paper comparing HOMA and warning about combining IR and IS data from different sources.

Paper six describes a clinical audit performed at the QEHB. This was requested by Dr Sandip Ghosh to establish how many emergency adult admissions had glucose measured and had high glucose but no previous diabetes diagnosis before admission. Experience there had

shown young Asian males being admitted with ketoacidosis, very high glucose and HbA_{1c} above 150 mmol/mol. The paper published in *Endocrinology, Diabetes and Metabolism* in 2020 showed that 5% of White European and 8% of South Asian and Afro-Caribbean admissions had glucose in the diabetes range on admission as illustrated below.

Since HbA_{1c} is being used for diagnosis in the community as outlined by the World Health Organisation (WHO), it would seem sensible to use it for diagnosis in hospital as well although more of the admissions will have conditions that affect its accuracy. Paper seven, involving a literature search on this topic, was published in the *British Journal of Diabetes* (*BJD*) in December 2022. It shows that standard procedures are not being adopted when glucose is high on admission and there is no previous diagnosis of diabetes.

How many of your friends have been diagnosed with diabetes at a routine GP visit but have no idea what the test was or what 48 mmol/mol means? Our eighth Desert Island Paper to be published in *BJD* in December 2023 outlines the current role of HbA_{1c} for management of diabetes, diagnosis in hospital admissions, use during COVID-19 for gestational diabetes and now remission of type 2 diabetes.

It includes clinical case reports for complicated situations involving the use and accuracy of HbA_{1c}. Some of these case reports and others were displayed as posters in April 2023 at the Diabetes UK (DUK) professional conference in Liverpool. In addition, issues relating the accuracy of HbA_{1c} to red blood cell profiles were highlighted at the 2022 meeting of the ADA in New Orleans and included in an oral discussion at the 2023 European Association for Study of Diabetes (EASD) meeting in Hamburg.

DUK 2023

Webber J, Mostafa S, Raghavan RP, Round RA, Manley SE, Karwath A, Gkoutos GV, Roberts GA. Diagnosing gestational diabetes during the COVID-19 pandemic using HbA_{1c} rather than oral glucose tolerance test (OGTT). *Diabet Med* 2023; 40 (Suppl 1): P159. https://doi.org/10.1111/dme.15048

Mostata S, Webber J, Ganapathy K, Raghavan RP, Round RA, Manley SE, Karwath A, Gkoutos GV, Roberts GA, Ghosh S. Complex presentations in people with diabetes: Does HbA_{1c} help or hinder? *Diabet Med* 2023; 40 (Suppl 1):P153. https://doi.org/10.1111/dme.15048

ADA 2022

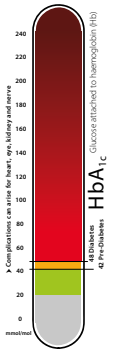
Karwath A, Williams JA, Round RA, Stratton IM, Gkoutos G, Mostafa S, Roberts G, Webber J, Manley SE. By how much does red blood cell status affect the accuracy of HbA_{1c}? American Diabetes Association 82nd Scientific Sessions, June 2022. 973-P. https://doi.org/10.2337/db22-973-P

Williams JA, Karwath A, Round RA, Stratton IM, Ghosh S, Mostafa S, Roberts G, Webber J, Gkoutos G, Manley SE. Relationship of HbA_{1c} and glucose by ethnicity in UK Biobank. American Diabetes Association 82nd Scientific Sessions, June 2022. 133-LB. https://doi.org/10.2337/db22-133-LB

EASD 2023

Manley SE, Karwath A, Round RA, Stratton IM, Gkoutos GV, Mostafa S, Roberts GA, Webber J. By how much does red blood cell status affect the accuracy of HbA_{1c}? *Diabetologia* 2023;66 (Suppl 1): S421-2. https://doi.org/10.1007/s00125-023-05969-6

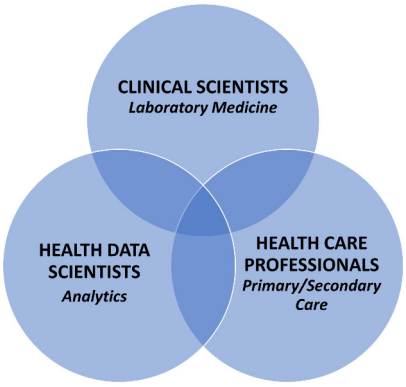
Artwork was commissioned for this *BJD* paper to explain HbA_{1c} to people and highlight its range from 20 mmol/mol to over 200 mmol/mol.



Conclusion

These papers published in many different medical, clinical chemistry and diabetes journals over the years reflect the work of non-clinical researchers, located in universities, Oxford and Birmingham, and in the NHS by the Diabetes Translational Research Group (DTRG), Birmingham. They show how their contribution to clinical research has progressed over the years, its impact and what the challenges are now. In particular, the university research laboratory benefitted from meeting the standards required for clinical pathology accreditation and the hospital laboratories from collaboration with the Hospital Statistician and the Health Data Scientists and UKPDS Statistician at the universities and in the NHS.

Their role in future will involve producing algorithms and models for diagnostic and treatment purposes. By employing available data and information from hospital and other electronic heath records (EHR), the outcomes will be used to assess individual patients. There is currently a vacuum in the collaboration/funding for bringing together health professionals



from laboratory medicine, secondary and primary care, and university experts in particular disease areas with those with up-to-date analytical skills i.e. digital medicine.

In conclusion, these researchers' contributions have been pivotal and essential for the clinical work leading up to changes in treatment for people with type 2 diabetes resulting in improved outcomes, diagnosis and remission of type 2 diabetes using HbA_{1c} and guidelines for clinical practice. The Clinical Scientist has been fortunate to be asked to contribute to international and national panels on HbA_{1c}, and guidelines for care of inpatients and people with diabetes in care homes.

On reflection, funding for clinical science research is extremely hard to procure and the administrative processes involved (for which no resources are available) are very time consuming. Our recent publications, abstract submissions and grant applications have been possible because of a highly skilled research assistant, Rachel Round, at University Hospitals Birmingham with a laboratory background concentrating on these tasks. The research funding provided by one-off grants from an endocrinologist's research fund and the local hospital charity, University Hospitals Birmingham Charity, is very limited and covers only a small percentage of costs.

Medical research demands teamwork and we have been fortunate to establish the DTRG at QEHB with contributions from the experts in diabetes research there as well as from Gloucester, Wolverhampton, Oxford, Wales, Newcastle, Ireland and the USA.

References

1. UK Prospective Diabetes Study. XII: Differences between Asian, Afro-Caribbean and white Caucasian type 2 diabetic patients at diagnosis of diabetes. UK Prospective Diabetes Study Group. *Diabet Med* 1994;11(7):670-7. PMID: 7955993
   Citations: 29
2. Cull CA, Manley SE, Stratton IM, Neil HAW, Ross IS, Holman RR, Turner RC, Matthews DR. Approach to maintaining comparability of biochemical data during long-term clinical trials. *Clin Chem* 1997;43(10):1913-8. https://doi.org/10.1093/clinchem/43.10.1913
   Citations: 36
3. Stratton IM, Adler AI, Neil HAW, Matthews DR, Manley SE, Cull CA, Hadden D, Turner RC, Holman RR. Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. *BMJ* 2000;321:405-12. https://doi.org/10.1136/bmj.321.7258.405
   Citations: 12192
4. Manley SE, Stratton IM, Clark PM, Luzio SD. Comparison of 11 human insulin assays: implications for clinical investigation and research. *Clin Chem* 2007;53(5):922-32. https://doi.org/10.1373/clinchem.2006.077784
   Citations: 188
5. Manley SE, Luzio SD, Straton IM, Wallace TM, Clark PMS. Preanalytical, analytical, and computational factors affect homeostasis model assessment estimates. *Diabetes Care* 2008;31(9):1877-83. https://doi.org/10.2337/dc08-0097
   Citations: 45
6. Ghosh S, Manley SE, Nightingale PG, Williams JA, Susarla R, Alonso-Perez I, Stratton IM, Gkoutos GV, Webber J, Luzio SD, Hanif W, Roberts GA. Prevalence of admission plasma glucose in 'diabetes' or 'at risk' ranges in hospital emergencies with no prior diagnosis of diabetes by gender, age and ethnicity. *Endocrinol Diab Metab* 2020;3:e00140. https://doi.org/10.1002/edm2.140
   Citations: 6
7. Manley SE, Karwath A, Williams JA, Webber J, Raghavan RP, Singh BM, Webster C, Round RA, Stratton IM, Gkoutos GV, Roberts GA, Mostafa S, Ghosh S on behalf of the Diabetes Translational Research Group (DTRG), Queen Elizabeth Hospital Birmingham and Birmingham University. The use of HbA_{1c} for new diagnosis of diabetes in those with hyperglycaemia on admission to or attendance at hospital urgently requires research. *Br J Diabetes* 2022;22(2):95-104. https://doi.org/10.15277/bjd.2022.386
8. Manley SE, Mostafa S, Webber J, Ganapathy KD, Taylor R, Little RR, Raghavan RP, Webster C, Barratt A, Round RA, Stratton IM, Karwath A, Williams JA, Gkoutos GV, Roberts GA, Ghosh S, on behalf of the Diabetes Translational Research Group (DTRG), Queen Elizabeth Hospital Birmingham and Birmingham University. When is HbA_{1c} useful and what do the numbers mean – do they help or hinder? In press *Br J Diabetes* to be published December 2023. ■

Credit: artwork – Alison Barratt

Plaque unveiling at Birmingham Children's Hospital to honour pioneering patient and team that helped change lives

Sam Holdsworth, Birmingham Women's and Children's NHS Foundation Trust

An official unveiling of a plaque dedicated to Sheila Jones, the first patient in the world to be treated for phenylketonuria (PKU) using changes in diet, was held at Birmingham Children's Hospital (BCH) on Saturday 21 October 2023.

The work was officially published in the academic journal *The Lancet* 70 years ago and was the catalyst towards many 'firsts' pioneered in the treatment of the condition by the specialist paediatric hospital. PKU is a rare inherited disorder and is due to an enzyme deficiency which results in an inability to break down an amino acid, phenylalanine (a building block of protein). Without treatment PKU causes severe intellectual disability.

The ceremony honoured Sheila and the team who treated her in the 1950s – Dr Horst Bickel, Dr John Gerrard and Dr Evelyn Hickmans – who won the prestigious international John Scott Medal in 1962. Young people currently being treated and their families were also in attendance to mark the occasion.

Professor Anita MacDonald OBE, Consultant Dietician in Inherited Metabolic Disorders at Birmingham Children's Hospital, said: "We're excited to honour Sheila and the team that worked so tirelessly to help her, who discovered how to help not only Sheila but other patients who have PKU using changes to their diet. Sheila and her mother, Mary, made immense contributions. Thousands of children with PKU and other rare diseases are now diagnosed early and can enjoy normal healthy lives. As a hospital, we have a strong track record of conducting much research in PKU and having a huge impact in the treatment of this disorder across the world – something of which I'm incredibly proud".

Professor Anne Green, formerly of Birmingham Children's Hospital, who wrote a book about Sheila, said: "The team who did this amazing work are one of the few medical professionals in history to have won the John Scott Medal. We're so pleased that with Sheila's and Dr Gerrard's family in attendance, this John Scott Medal was returned to our hospital to be put on display alongside our plaque, making sure that Sheila, Mary and the Children's Hospital's legacy will be recognised for years to come".

Sheila's brother, Trevor Jones, who officially unveiled the plaque, said: "I'm overwhelmed. I can't believe how big it feels. I don't think I knew how big a contribution Sheila and my mum made around the world, I'm so in awe of them. I can't believe it was my mum who was banging on the doctors' doors, she never came across like that, I don't know how she had the time or the bus fare to do it".

Sheila was born in Birmingham in 1949 and was diagnosed with PKU in 1951. At that time, there was no treatment, but Mary waited outside the hospital laboratory daily and persisted in demanding help for her daughter.

Three doctors at Birmingham Children's Hospital, Dr Horst Bickel (a doctor from

Photograph is copyright Women's and Children's NHS Foundation Trust and shows from left to right: Professor Anne Green, Mr Trevor Jones and Professor Anita McDonald

Germany studying in the UK), Dr John Gerrard (Paediatrician) and Dr Evelyn Hickmans (Head of Biochemistry), took up the challenge and worked tirelessly to prepare a special diet. This was the first ever low phenylalanine protein substitute (protein replacement) for PKU.

Sheila could have no natural protein such as eggs, fish or meat but instead had to drink an unpleasant liquid as protein substitute. This first dietary treatment was made up in a large laboratory glass bottle (Winchester), which Mary had to collect every week and carry home on the bus. Within a few months of starting treatment, Sheila began to take more interest in her surroundings and played more. She was brighter and began to make eye contact and could sit and began to stand. Sheila eventually walked unaided and made further progress in her development.

The discovery that a low phenylalanine diet helped Sheila led to national newborn screening for the condition via the heel prick test, and the commercial production of formulae for PKU treatment across the world. There is now new medication in development which could mean that PKU patients may be able to have a regular diet.

Current PKU patient, Rachel Small, said: "I've responded really well to a new drug called Sapropterin (BH4) which is helping me to eat protein in meat and eggs. For most of my life I have been on a really strict diet, and originally there was very little by way of low protein foods. It would involve a lot of planning meals and balancing my allowance across the day. I'm grateful for those who campaigned for this, I'm relearning how to eat again after 46 years".

This also led to a number of other firsts

for the Children's Hospital in the study of PKU. These include:

- In 2003-2004, BCH was one of the first UK hospitals to trial the drug sapropterin in a group of people with PKU. This drug is used in combination dietary management. It enables patients to eat more protein and eases the burden of the diet.
- BCH is the first hospital in the UK (and beyond) to trial many new dietary treatment strategies in PKU to improve the quality of the dietary management.
- One of our local families developed their own business (Fate Special Foods) as a consequence of having two girls with PKU. This company supplies low protein products worldwide.
- The Chemistry Laboratory at the Children's Hospital, where the work was undertaken to prepare Sheila's diet, was founded by Evelyn Hickmans in 1923 – the first Chemistry laboratory of its kind. It has just celebrated its centenary and now screens babies across the West Midlands for PKU and nine other disorders.
- The City of Birmingham pioneered newborn screening in 1959 – the first place in England.

The ESPKU (European Society for PKU) requested and financially supported the Sheila Jones plaque. It has an annual Sheila Jones Award, which goes to a PKU advocate who has done much to support others with the condition.

If you would like to hear more about this story, Anne Green recently gave an online lecture to the Royal Society of Chemistry on Evelyn Hickmans, which can be found by following this **direct link**. ■

EFLM Scientific Research Grant 2024

Since January 2023, all paying members of the ACB also qualify as EFLM Academy members. As such, they are eligible to apply for EFLM Scientific Research Grants.

The EFLM Scientific Research Grant has been established to promote science and facilitate research in Laboratory Medicine in Europe. Two grants of up to €10,000 each are awarded each year – although only one is available to ACB Members.

Applicants must submit a detailed budget of their study, with a list of all required reagents or consumables. Eligible applications will be judged by a Research Grant Evaluation Committee, composed of the Chair of the EFLM Committee for Science, the Chair of the EFLM Committee for Education and Training and one EFLM Executive Board Member selected by the EFLM President.

Selected applicants are to publish the findings of their study in an international journal (preferred) or a national peer-reviewed one, within two years of receiving the grant. The application deadline is 15 January 2024. More information can be found on the **EFLM website**. ■

I remember when . . .

by Howard Worth

After completing a PhD and three years on a postdoctoral fellowship, my first career post was as a Lecturer in the Chemical Pathology Department at Aberdeen Medical School. A department that was very different from the one now run by Professor Bernie Croal, Past President of the Association for Clinical Biochemistry and Laboratory Medicine and President Elect of the Royal College of Pathologists.

At that time all medical and scientific graduate appointments were academic posts made by the University, but with an honorary contract within the NHS to run and maintain the chemical pathology service to the Aberdeen hospitals. Thus, making it one of the largest laboratories in the UK (as I believe it still is) as it covered the whole of Aberdeenshire.

In my day, the Head of Department was Professor Sam Frazer who had come from Edinburgh where he had been Senior Lecturer under the tutelage of C. P. Stewart, Clinical Scientist. Like many other senior medical consultants who had come under Stewart's influence, he could not praise his teaching and guidance enough. Stewart had the same influence in Scotland as Earl King had at the Hammersmith Hospital (see *ACB News*, June 2023, page 16). Sam was an autocratic Head of Department who carefully selected a young staff, who he thought had potential to move on and make a serious contribution to the profession elsewhere and would not challenge his running of the department. Generally, his policy worked well, but we did have the advantage of having started our careers in a prestigious department in, if not the oldest medical school in the UK, certainly one of the oldest. Of course, Sam did have to have a more senior member in his department. Again, this was carefully selected, as he appointed a Senior Lecturer who he knew well, as he was a Lecturer at Edinburgh University and who would not challenge his style of governance!

Our time was split three ways, research, teaching and a commitment to the hospital routine laboratory which was usually carried out on an agreed rotation. As part of my contract, my research programme was to work with the renal consultant on the lipid status of nephrotic syndrome patients. Teaching consisted primarily of practical classes, measuring creatinine clearances and glucose tolerance tests (GTT). The main purpose was to teach medical students how to take blood. At that time only medical graduates were allowed to take blood; the profession of phlebotomy came much later. The students worked in pairs for the GTT and one of them 'volunteered' to have the test carried out and came in fasted. On one occasion the volunteer passed out after the first blood was taken. As soon as she came round the Senior Lecturer in charge insisted another sample was taken. The effect was impressive as she had gone from a hypoglycaemic state to a hyper-state due to the release of adrenalin. A lesson for all of us.

At the time I went to Aberdeen, the department was disseminated and we were peripatetic. The Medical School and the Royal Infirmary are both on the same site at Foresterhill which, in those days, was on the outskirts of the city. The routine laboratory was located on the ground floor of the Medical School whereas most of the department's laboratories were on the top floor. I was located in the Renal Unit in the Royal Infirmary where I had a laboratory. The practical classes were taken in the Biochemistry Department in Marischal College which was in the centre of the city and housed many of the university departments. After my arrival in Aberdeen, a new wing was opened in the Medical School which housed the whole of the Chemical Pathology Department in what we regarded as luxurious accommodation. All our Christmases had come at once!

One of the great advances in analytical clinical biochemistry was established while I was working in Aberdeen, namely the establishment of the National External Quality Assessment Scheme (NEQAS), led by Professor Tom Whitehead at the Queen Elizabeth Medical Centre, Birmingham. We received our first sample with a request to carry out a series of routine analyses and send the results back to Birmingham (see *ACB News*, June 2023, page 58). Our first reaction was to question why we needed someone from Birmingham to check our analytical quality as we had a perfectly good and robust internal quality control programme in place. We then got the first national results back, comparing our results with those of the other laboratories in the country! The programme was then taken much more seriously. From this relatively small beginning the programme became international and covered all pathology disciplines. I left Aberdeen when I was appointed by Tom Whitehead as a Senior Biochemist at the Queen Elizabeth Hospital. Through this connection, I was involved in extending NEQAS programmes internationally, particularly to Mexico.

My other particular recollection from Aberdeen was the assessment of thyroid function. This has already been referred to by William Marshall in 'I remember when . . .' in the February 2023 issue of *ACB News.* The assessment of basal metabolic rate (BMR) was an awesome procedure for many patients and must in itself have affected their rate. The other problem was its calibration as that needed a volunteer in a relaxed state. Fortunately, we had a young lad who was the department's store keeper. He was not the brightest knife in the drawer and was very laid back; this made him ideal. The BMR machine was now being replaced by the protein bound iodine (PBI) analyser. This was an elegant piece of chemistry where the iodine from thyroxine was released and would catalytically reduce yellow coloured cerium IV salts to colourless cerium III quantitatively according to the amount of iodine present. Technicon marketed a continuous flow analyser specifically to measure PBI. The first step in this process was to liberate the free iodine by digesting the sample in a hot mixture of concentrated sulphuric acid and perchloric acid. This was not without its hazards, and the equipment was kept in a stainless-steel fume cupboard, but even there, any spillage tended to dissolve the floor of the fume cupboard. The Senior Chief Technician (as was his title in those days) took sole responsibility for the running of the machine and would not allow any of his staff to operate it. A major problem was the risk of contamination, as the amount of iodine being released was of nanomol quantities. Under no circumstances whatsoever should clinicians request a PBI in a patient that had recently been given iodine. However, the inevitable would happen sooner or later. The Chief was a slightly balding middle-aged man. There would be a loud clunk as the pen on

the recorder hit the high end of the chart with force. This would be followed by the Chief's slapping of his forehead and a series of Scottish expletives. He would now spend the next day pumping out the excess iodine from the analyser before further analyses could be carried out. Eventually PBI was followed by competitive binding methods and other modern techniques revolutionising the assessment of thyroid function.

Just before I left Aberdeen the department took charge of a PDP computer which nearly filled the whole of one wall. I am not sure we were certain of what it was going to do, but of course it turned round and sped up the reporting of results and reduced the error rate, which was inevitable in the past as all results were copy typed from work sheets on to result forms by an army of typists.

I would like to finish with one amusing anecdote. My final appointment was as Head of Department at King's Mill Hospital in Sutton in Ashfield, Nottinghamshire. At that time the senior Medical Consultant, one Dr Caley, was an impressive old-fashioned clinician who ran a very tight ship. He held monthly meetings of the consultant staff and when a newly appointed consultant joined the staff, he or she was expected to give a presentation to the assembled company. When it came to my turn, I decided to talk about NEQAS. I explained how the system worked anonymously. Poor performing laboratories were sent a letter inviting them to identify themselves and contact Professor Whitehead to seek advice. Until they had done this, the laboratory was not identified. Dr Caley had difficulty in accepting this, but I assured him that was the case and as I had worked in the department, I had seen the system in action. His parting comment was, "Well all I can say is, that I would bloody well want to know!".

One of the most important decisions we all make in our lives is the selection of a career. Those of my generation who chose Clinical Biochemistry have seen our profession evolve from a chemical analytical service to a branch of biochemistry and now into molecular science. We have been privileged to be part of this process in which we have led the other pathology disciplines in enhancing both medicine and science. Indeed, I believe the UK has led the world in this respect. We have left a legacy which I am sure the present generation will take up and develop with the same enthusiasm. ■

Happy Holidays from the *ACB News* Team

Thank you to everyone who has helped on ACB News –
Nikki Williams (for the design and layout of each edition),
the Associate Editors, Sue Ojakowa of PRC Associates (our publisher)
and all the ACB staff at Tooley Street.
They all do a fantastic job of ensuring that we produce *ACB News*
on time every two months.
Thank you also to everyone that has taken the time to send in articles,
without you there would be no *ACB News*.

Here's to a healthy and happy New Year!

Gina Frederick, Lead Editor

Birmingham's Public Art

Here at *ACB News*, we are always willing to showcase what our Members do outside of the profession.

Jonathan Berg, one of our retired (and longest-serving) *ACB News* Editors, has been putting the experience he gained from publishing *ACB News* to good use by writing various books about Birmingham. He also set up Positively Birmingham Walking Tours in 2016, providing public and private tours of the city, with a proportion of the turnover donated to the Birmingham based charity Sifa Fireside.

His recently published book, *Birmingham's Public Art*, is now available to buy from some Birmingham bookshops and Amazon, with some of the proceeds again going to charity, if you are looking for ideas for a Christmas present.

Birmingham's Public Art is a brand-new coffee table style book which explores the amazing public art to be seen all around the city and includes 330 colour photos. This is the first book in 25 years to study the huge range of public art of Birmingham. Signed copies can be purchased **direct from the publisher.** ■

Sudoku . . . this month's puzzle

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

Solution for October

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

Defining diversity in Biochemistry

Devon Buchanan, Anisha Mathews, Jessica Johnson

Devon was called by a GP about a vitamin B12 result that was above the upper limit of the reference interval (RI). The doctor had already performed a myeloma screen and liver ultrasound, looking for malignant causes, and found nothing, so asked whether they should perform any further investigations. Further questioning revealed that the patient was a Black Caribbean person, a group that is known to have higher serum B12 results than White populations. Some colleagues had recently published a paper which indicated that this patient's B12 was, in fact, normal for a Black person. The B12 RI reported by the lab resembled the one calculated for White and Asian populations, and this contributed to the patient's unnecessary investigations and possibly increased anxiety.

An important cause of these unsuitable RIs is the fact that populations recruited in studies are often not representative of the people that receive healthcare. The kit insert that the reported RI came from didn't describe the ethnic makeup of the reference population, but it appears unlikely that it included many Black people. In contrast, 24% of people living in the local area identified as Black in the 2021 Census. This issue affects all types of medical research – the UK NIHR INCLUDE project identified that people taking part in randomised controlled trials of healthcare interventions are often younger, have fewer comorbidities, and are less ethnically diverse than the people who are seen in clinical settings. The issue is particularly important for RI studies because many groups that are under-served by research also have physical differences leading to different RIs. These include people at age extremes, men or women (depending on the context), pregnant people, transgender people, socially and economically marginalised people, smokers and people living with obesity.

This situation can be improved by biochemists conducting reference interval studies aiming to be inclusive or targeting specific under-served populations. The INCLUDE project makes suggestions that are relevant to this sort of study: funders (e.g. the UK NIHR) may offer grants for studies that target these populations, and studies embedded in routine healthcare often have lower barriers to access. Devon herself followed these guidelines when she set up the Trans and Non-Binary Reference Intervals while on Hormone Therapy (TransRIHTS) study – as it targets an under-served population with features that were likely to affect laboratory results, it is funded by Synnovis, and is embedded within CliniQ, which provides healthcare for trans and non-binary people.

RI diversity (and lack thereof) is also a problem when these RIs are exported to the developing world, where many of the RIs reflect those used in western and European countries.

Anisha is a Chemical Pathologist from Rishikesh, Uttarakhand in Northern India, and in her experience while training in hospitals, urea in a healthy individual was often on the lower end of the reference interval quoted by the manufacturer. Many people would have a urea within the quoted reference interval despite a history of renal injury or dehydration.

Coming to the same conclusion, **Shah and colleagues** measured a reference interval in Indian populations that was lower than those commonly used in the UK. This is an example of the importance of environmental influences on reference intervals, because the lower average urea in India is likely to be caused by the lower average meat consumption. In a UK study, **Tong and colleagues** showed that vegetarians had lower urea concentrations on average and within those groups there was negligible difference between White British and British Indian people.

Vitamin D is another interesting example of how making assumptions about causes might lead to over treatment. It is often stated that people with darker skin are more likely to be vitamin D deficient as they are unable to create enough vitamin D. However, **Hermann and colleagues** show evidence that while Black Americans have lower total vitamin D levels than White Americans, they are not more likely to have osteoporosis or differences in PTH levels. Further investigation revealed that Black Americans are also more likely to have lower Vitamin D Binding Protein levels – if the free vitamin D levels are calculated instead then this is similar between both groups of people. Vitamin D binding protein and free vitamin D are not routinely calculated, and thus it is possible that our decision limits for patients with lower total vitamin D are not truly valid for the entire population.

To conclude, we need more studies to try to define reference intervals for under-served populations so that they receive the best medical care. However, when creating these studies, we must be mindful to not essentialise groups that are not truly homogenous, and to ensure that environmental influences are also accounted for. This will help us to better serve our local populations, and awareness of these differing influences means that we can give individualised advice when called by service users about their patients. ■

Deacon's Challenge Revisited – No 28 Answer

The incidence of the Gilbert genotype is common in the US and Europe. If the incidence of the variant bilirubin-UGT (UGT1A1) promoter associated with Gilbert's in a population is 9%, what proportion of the population carry at least one copy of the variant promoter? (Assume Hardy-Weinberg equilibrium applies).

Gilbert's follows an autosomal recessive mode of inheritance. If the normal promoter, A, has an incidence p and the variant promoter, a, has an incidence q, then according to the Hardy-Weinberg equilibrium, the distribution of the genotypes AA, Aa and aa will be p^2, $2pq$ and q^2 respectively.

The incidence of the Gilbert genotype, aa, is q^2 which we are told is 9% (0.09).

Therefore, $q = \sqrt{0.09} = 0.3$

and since $p + q = 1$, it follows that $p = 1 - q$, i.e. $p = 1 - 0.3 = 0.7$

The genotype AA (incidence p^2) is the only one without at least one copy of the variant promoter

$p^2 = 0.7^2 = 0.49$

Therefore the proportion of the population with at least one copy of the variant promoter

(i.e. $q^2 + 2pq$) = 1.0 - 0.49 = **0.51 (51%)**

Question 29

The analytical imprecision (Cva) of serum iron in your laboratory is 10%. Iron was measured on several occasions in healthy volunteers, and the within-subject coefficient of variation of the measured iron results was found to be 15% (calculated using nested ANOVA).

Estimate the true biological coefficient of variation in serum iron.

Calculate the expected coefficient of variation of the results in these volunteers if the analytical procedure is performed in duplicate (on a single sample per patient with results expressed as the mean of the duplicate determinations) instead of singlicate.

MRCPath, November 2003

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 38 from October's *ACB News*

Which of the following is bacteriostatic but not bactericidal? What are the different actions of each of the antimicrobials listed?

A. Kanamycin
B. Chloramphenicol
C. Cephaloridine
D. Benzylpenicillin
E. Colistin

The antibiotics which are seen as bacteriostatic are sulphonamides, tetracyclines, chloramphenicol, erythromycin and trimethoprim.

Kanamycin is an aminoglycoside which inhibits protein synthesis by binding to the 30S ribosomal subunit. It is bactericidal.

Chloramphenicol inhibits protein synthesis and is mainly a bacteriostatic agent but can be bactericidal for meningeal pathogens eg, *Haemophilus influenzae, Streptococcus pneumoniae* and *Neisseria meningitidis*.

Cephaloridine is an example of a first generation cephalosporin which will inhibit cell wall synthesis but would only be bactericidal whilst organisms replicate.

Benzylpenicillin is an example of a penicillin which is bactericidal only whilst bacteria are growing.

Colistin is a polymyxin which is often used for multidrug resistant gram-negative infections and can penetrate cell wall membranes and is bactericidal.

Question 39

With the holidays around the corner, here are a smorgasbord of questions to tackle. Please answer each statement as true or false:

A. *Salmonella typhi* is motile.
B. *Salmonella typhimurium* is one of the most strictly host-specific of all the food poisoning organisms.
C. Coxsackie B virus is frequently associated with pleurodynia.
D. Respiratory syncytial virus (RSV) is frequently associated with chronic bronchitis.
E. Ethylene oxide is effective as a sterilising agent within a limited range of conditions of temperature and humidity.
F. A notable feature of influenza virus, type A (FluA), is its ability to change its antigenic structure.
G. *Tubercle bacilli* are acid-fast.

The answer to Question 39 will appear in the next issue of *ACB News* – enjoy! ■

Decarbonising diagnostic laboratories: key literature and steps towards a more sustainable future

Callum Goolden – Trainee Clinical Scientist (Microbiology), ACB Green Champion

Atmospheric carbon-dioxide (CO_2) levels have risen by approximately 50% since the pre-industrial era to the current peak of 421 ppm in July 2023.[1] Climate data demonstrates that we have observed a 1.1°C increase in global average temperatures over the same period. It has been calculated that to avoid the worst consequences of climate change, we must limit the increase in average global temperatures to below 1.5°C.

Healthcare is a considerable contributor to global greenhouse gas emissions. It is estimated that the healthcare sector contributes 4.4% of total global emissions.[2] As such, the NHS has set targets to reach 'net zero' by 2040 for direct emissions and 2045 for emissions that it influences.

In this column, I aim to summarise three key papers focussed on carbon footprint calculations, and subsequently outline ways in which diagnostic labs can look to reduce their own environmental impacts.

Health care's response to climate change: a carbon footprint assessment of the NHS in England" Tennison e*t al*, 2021

Starting broad, this 2021 paper by Tennison *et al* describes a carbon footprint assessment of the NHS at whole system level. The NHS has been performing quantification of its carbon footprint since 2008 with the establishment of the Sustainable Development Unit (SDU) (now Greener NHS). The analysis employs a hybrid modelling approach including scope 1, 2 and 3 emissions as per the GHG protocol as well as patient and visitor travel emissions. The analysis demonstrated that the NHS was responsible for 25 megatonnes (Mt) of CO_2e in 2019. This represents a reduction of 26% since 1990, primarily due to decarbonisation of the UK energy grid. The reduction has been achieved upon a backdrop of substantial population increase (17%) and a doubling in care provision by the NHS. This 25Mt value actually represents a 64% reduction in emissions per inpatient episode since 1990. Looking at a breakdown of emission data, 62% of CO_2e were associated with supply chain, with the vast majority of this being a result of the manufacture of goods. Twenty-four percent was accountable to direct care delivery, 10% due to staff commuting and patient or visitor travel and 4% due to private health delivery and NHS commissioned services. Interestingly, the construction of healthcare facilities and freight transport, often heavily implicated activities, were responsible for only 5% and 6% of total CO_2e emissions respectively.

The carbon footprint of pathology testing – McAlister *et al,* 2020

This paper, written by an Australian group based out of Melbourne was the first

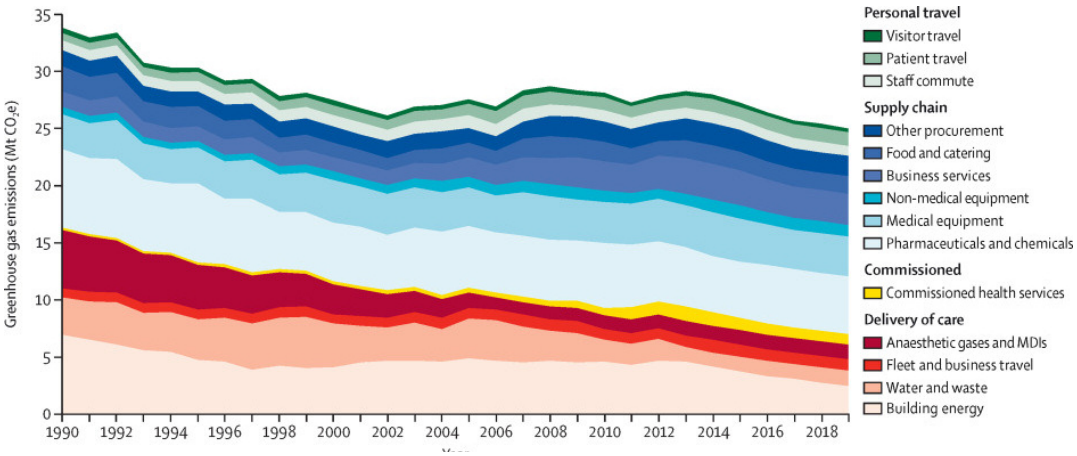


Figure 1: Time series for the greenhouse gas emissions of the NHS in England, broken down by source of emission, 1990-2019. MDI = Metered dose inhaler, Mt CO_2 = megatonnes of carbon dioxide equivalent. (From Tennison et al, 2021)

published carbon footprint analysis of pathology testing performed in accordance with ISO 14040 principles and framework. The study focusses on key blood sciences analytes: Full blood count (FBC), Coagulation profile, Urea and Electrolytes (U&E), C-reactive protein (CRP) and Arterial blood gas (ABG). The results show that a single Coagulation profile is responsible for 82 g CO_2e/test, with FBC = 116 g CO_2e/test, U&E = 99 g CO_2e/test, ABG = 59 g CO_2e/test and CRP coming in at 0.5 g CO_2e/test. These values correspond to the equivalent of between 3-770 km of car travel/1000 tests. Interestingly, the study found that the majority of the CO_2 emissions generated by pathology tests are associated with sample collection. This is most strikingly demonstrated by the stark difference between the carbon footprint of U&E testing and CRP, where the CRP value was calculated in an

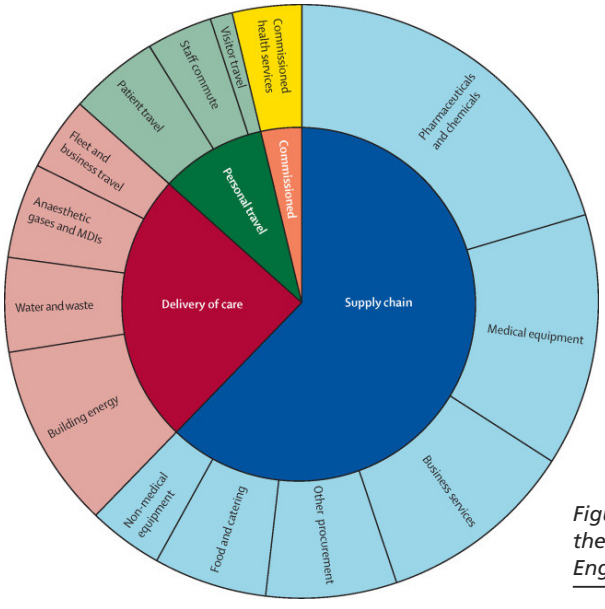


Figure 2: Contribution of different sectors to the greenhouse gas emissions of the NHS England, 2019 (From Tennison et al, 2021)

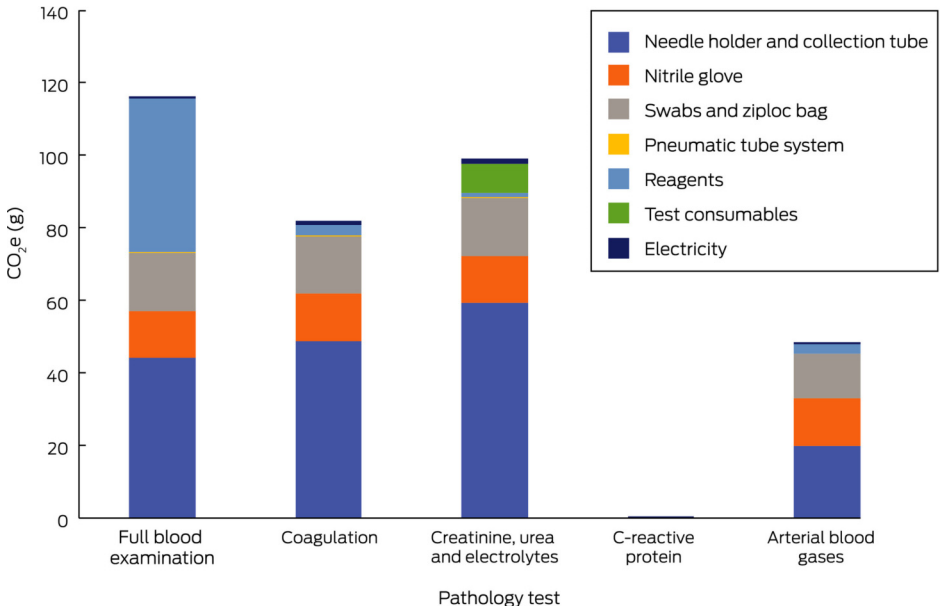


Figure 3: Carbon dioxide equivalent (CO_2e) emissions associated with single pathology tests, by test component. From McAlister et al, 2020

attributional analysis, foregoing the footprint associated with blood tube production and sampling as this test is frequently ordered alongside routine biochemical tests on the same primary sample. A further 2021 paper by the same group expanded the analysis to include urinalysis and found the carbon footprint to equal 538 g CO_2e/test, with the bulk of the carbon associated with additional test consumables (agar plates), compressed air for flow cytometry and culture incubation.[3]

The carbon footprint of waste streams in a UK hospital – Rizan *et al*, 2021

A group based out of Brighton and Sussex University Hospital NHS Trust aimed to estimate and compare the carbon footprint of hospital waste streams using a process-based carbon footprint analysis. The study found that the carbon footprint (per tonne) of hospital waste is lowest when recycled (21-65 kg CO_2e) followed by low temperature incineration with energy from waste (EfW) (172-249 kg CO_2e). When waste was additionally decontaminated using autoclave prior to low temp incineration with EfW, the carbon footprint = 569 kg CO_2e. The waste disposal option with the highest carbon footprint was high temperature incineration (1,074 kg CO_2e/tonne). In addition, NHS data shows that the financial cost of the different waste streams mirrors that of the carbon footprint.

What can we do to reduce the carbon footprint of labs based on the evidence?

The data in the three papers described above provide evidence to support the implementation of specific laboratory practices. The heavy contribution of supply chain on the overall carbon footprint of the NHS illustrates the impact that green procurement decisions may have for clinical laboratories. Furthermore, the contribution of consumable items to the carbon footprint of individual pathology tests demonstrates the impact that optimising diagnostic testing

algorithms and reducing unnecessary testing may have on a labs environmental footprint. Where laboratory testing is necessary, transitioning to re-usable labware will likely also have a significant impact vs single-use plastic items.

Promoting active travel, be that walking or cycling to and from work is another option for labs looking to reduce their overall carbon footprint. For longer journeys, advocation for the use of public transport can be adopted as buses or trains have a much lower carbon footprint than personal vehicles. Finally, when considering waste, auditing waste disposal practices in your laboratory may uncover some surprising results. Do you know how your various waste streams are disposed of? Are staff correctly disposing of items in the correctly identified bins? In Microbiology labs, limiting autoclave use for items contaminated with microbiological waste can reduce load size and the associated carbon footprint of waste disposal. Many NHS trusts now have a responsible "Waste Manager" who will be well placed to advice and support any initiatives relating to waste reduction.

If you have any suggestions or examples of good sustainable practice, please submit them to the Green Champions group via the following good practice form: **ACB Green Champions – good practice submission form**.

References

1. NASA Global Climate Change. Climate Change: Vital Signs of the Planet. 2023. Global Climate Change. Vital Signs of the Planet – Carbon Dioxide Concentration. Available from: **https://climate.nasa.gov/vital-signs/carbon-dioxide**
2. Lenzen M, Malik A, Li M, Fry J, Weisz H, Pichler PP, *et al*. The environmental footprint of health care: a global *assessment.* Lancet Planet Health. 2020 July 1; 4 (7): e271-9.
3. McAlister S, Grant T, McGain F. An LCA of hospital pathology testing. The International Journal of Life Cycle Assessment. 2021; 26(9):1753-63. doi:10.1007/s11367-021-01959-1

Key papers

- Tennison I, Roschnik S, Ashby B, Boyd R, Hamilton I, Oreszczyn T, *et al*. Health Care's response to climate change: A carbon footprint assessment of the NHS in England. *The Lancet Planetary Health.* 2021;5(2). **doi:10.1016/s2542-5196(20)30271-0**
- McAlister S, Barratt A L, Bell K J, McGain F. The carbon footprint of pathology testing. *Medical Journal of Australia*. 2020; 212(8):377-82. **doi:10.5694/mja2.50583**
- Rizan C, Bhutta MF, Reed M, Lillywhite R. The carbon footprint of waste streams in a UK hospital. *Journal of Cleaner Production*. 2021;286:125446. **doi:10.1016/j.jclepro.2020.125446**

ACB Laboratory Medicine Leaders' Summit

Kath Hayden, ACB President

28 September 2023 Birmingham International Convention Centre

It was my great pleasure to welcome delegates to the inaugural Laboratory Medicine Leaders' Summit, which for the first time was hosted at IBMS Congress enabling delegates from both the ACB and IBMS to take advantage of attending. Some may remember the hugely popular series of FiLM, or Frontiers in Laboratory Medicine, meetings run by the ACB (in collaboration with colleagues at DarkDaily in the USA) over the previous two decades, which covered strategic developments and sharing innovative practice across the UK, Europe and the USA. Ultimately these meetings ran their course as many of the developments, particularly around formation of networks, hub and spoke laboratories, new technologies and advances in laboratory quality and informatics, became commonplace.

This year we wanted to try a new approach and developed a programme that tackled some of the key areas that are challenging us now and will form the priorities for us as an Association and across Laboratory Medicine, in the next couple of years.

Developments in artificial intelligence (AI)

We opened with **'Blood sciences: not AI yet but evolving'** delivered by Dr Ellie Dow, a Consultant in Biochemical Medicine at NHS Tayside. Dr Dow started by presenting some grim statistics: liver disease is the cause of an increasing

number of deaths in the UK in those under 65 years, compared to other diseases such as diabetes mellitus, heart and lung disease. Seventy percent of patients with cirrhosis first present to hospital with liver failure and 25% of those die within 60 days. There is a need for early detection of liver fibrosis and pre-fibrotic disease along with guidance for GPs for how to follow-up abnormal liver function tests (LFTs). In a project developed at Ninewells Hospital and the University of Dundee Medical School, the Intelligent Liver Function Test (iLFT) implements a prediction algorithm that standardises the investigation of LFT results. Dr Dow was keen to stress that this is not AI, but a manually developed programme, however, it highlights how systems may evolve using AI to improve diagnosis and patient care. The iLFT system of automated diagnosis provides GPs with a rapid and reliable triage tool for liver abnormalities and importantly then a management plan. The project evaluated 310,511 patient LFTs from an 18-year period, 1989-2007, and an expert group was convened to develop minimum diagnostic criteria of liver disease with parameters including BMI,

alcohol use, metabolic syndrome, clinical information, blood test results and fibrosis score. Reflex testing for additional tests includes immunology and virology tests. Three options are provided for management of patients: (1) requires secondary care (AIH, PBC, HCV, NAFLD, likely fibrosis), (2) conditions that can be managed by the GP, and (3) no follow up required. The iLFT algorithm was assessed to have correctly assigned patients in 295/323 cases (diagnostic accuracy 91.3%). Dr Dow's main recommendations for developing intelligent tools are to identify and understand your IT programmes, get subject matter experts to agree, understand how GPs request and report tests and to test the tool in clinical practice or trials. The iLFT was assessed to cost £284 per correct diagnosis, however, it provides a cost-saving of £3216 per patient lifetime.

The second presentation **'NPIC's unique scanning facility for AI testing and development'** was delivered by Dr Matthew Humphries, Research Operations Manager for the National Pathology Imaging Co-operative (NPIC), Leeds Teaching Hospitals NHS Trust. The facility has been developed at St James's Hospital with the aims of being a centre of excellence in AI, a proving ground for digital AI, to disseminate digital pathology best practice, and to create opportunities for research and innovation to improve diagnosis and patient care. Already the facility is one of only five centres of excellence in digital imaging and AI in the UK and includes a network of over 30 hospitals and an impressive 3 petabytes of image data, with a hybrid cloud vendor neutral archive (VNA) and 30Pb mirrored storage in a hub and spoke model. Dr Humphries' team have created a unique multi-scanner facility to replicate digital pathology image datasets on multiple scanners, with 15 scanners from nine different manufacturers covering the range, as part of his AI FORGE project (Facilitating Opportunities for Robust Generalisable Data Emulation). In this multimodal study, all systems are loaded currently with 3087 slides (max 4000/day) and include the use of Z stack for cytology images, providing capability also for AI in cytology. His take-home messages were that the accuracy of AI algorithms developed will be largely dependent on the quality of the datasets used to train the module, and for AI tools to be generalisable for patient use will require whole slide images from a range of digital platforms. It will be fascinating to see how these AI tools develop.

The future of Laboratory Medicine

Dr Bernie Croal, RCPath President-Elect, chaired the second of our morning sessions which began with Professor Mike Osborn, RCPath President, giving an excellent talk on **'The future of laboratory services'**. He started with some key areas of focus currently including the 'Transforming Histopathology in England' paper, July 2023; the NHS Long Term Workforce Plan (NHSE); and that collaboration and working together will be really important for the RCPath, IBMS and ACB. Professor Osborn highlighted that although data, particularly around workforce, is currently poor, the plan identifies the need for extended roles for scientists, such as the advanced BMS roles for dissection and reporting that have been developed. Two hundred and thirty-eight scientists now hold the IBMS Diploma in Expert Practice in Histological Dissection with an additional 27 obtaining the Advanced Specialist Diploma (ASD) in Dissection (15 in Breast pathology, 11 in Lower GI, and 1 in Urology). An example of the benefits of these new ways of working is at NW London Pathology service where BMSs cut 95% of sections. Evolving programmes are in discussion, with the HSST in Histopathology being planned,

and Molecular Pathology/ Genomics being identified as a new branch of pathology needing support. Point-of-care testing (POCT) is an ever-increasing focus with recent national strategic guidance published for point-of-need testing, in particular integrating POCT into Community Diagnostic Centres (CDCs). Professor Osborn finished with a summary of future projects and reinforced the need for developments in AI to be clinically led.

We were delighted to welcome Professor Jo Martin CBE, NHS National Specialty Advisor for Pathology, to speak next about **'Networks and Diagnostic Hubs'** where she began with an overview of progress. As of May 2023, of the 27 networks in England assessed using the seven maturity domains, 6 networks were assessed as Maturing, 11 Developing and 10 Emerging. Professor Martin then moved to the CDCs, of which 177 have been approved, with 172 now open. She relayed that 4.5-5 million tests were delivered by CDCs in 2023/24 with between 8 and 9

Professor Jo Martin

million tests delivered since July 2021, although there remains a query as to how much of these figures is relocated activity from secondary care rather than new referrals from GPs. Moving onto the laboratory networks, there are increasing pressures on hubs and local services with increasing workload, in addition to continuing issues regarding networks' IT infrastructure and supply chain issues. Professor Martin put forward her view that we should measure the full patient pathway for laboratory testing as there

Domain	Mature	Non-mature
Governance	Governed or Trust-hosted, documented delegated decision making	Loose collaboration with absence of principles for delegated decision making
Leadership	Clearly defined leadership team	Programme roles
Operating model	Main laboratory and essential services laboratory	No defined model
Quality	Quality management governance to reduce variance	Non-standard approach
IT and digital	Single IT model	Multiple LIMS
Workforce	Workforce strategy in place	No workforce strategy – local competition for workforce
Shared supply chain	Efficiency benefits from economies of scale – reinvested	Multiple separate contracts

NHS Maturity Matrix

are frequently lengthy delays for patients for phlebotomy before blood tests are ever taken, whilst currently we only measure turnaround times once received in the lab. DM01 (Diagnostic Waiting Times and Activity 01) national required data reporting does not include pathology, especially histopathology and genomics. Changes to this data reporting to include pathology may improve patient care overall.

Laboratory informatics and impacts on patient care

The afternoon session provided fantastic insight into how we can use IT to affect patient care. The session started with **'Importance of laboratory informatics'** by Dr Jonathan Kay, Nuffield Division of Clinical Laboratory Services, University of Oxford, who highlighted that laboratory errors are mostly not the cause of serious adverse incidents (SAIs). However, interpretation errors are the biggest area, with estimates that between 5 and 30% of results are never seen by anyone or don't get to the right person, so he queried who is responsible and how we measure this. Reports are now sent out electronically via system suppliers, so laboratories have no control over what they look like or how they display, this is known as 'process obscurity'. Currently, there is a lack of clarity about who in our organisations is responsible for ensuring that tests are appropriate. There is a need for a computer clinical decision support system to provide advice on what clinicians should do next, and introducing a contextual hyperlink to LabTestsOnline (LTO)UK may aid in providing knowledge, particularly for patients. Data standard changes to FHIR/HL7 (FIHR: Fast Healthcare Interoperability Resources) will sort differences between middlewares and IT systems, but there remains a need for a measure for whether the right report gets to the right person at the right time.

The second talk gave us a thought-provoking patient insight from Lindsey Brown, Patient Representative for Manchester Academy for Healthcare Science Education (MAHSE) and the Faculty of Biology, Medicine and Health, University of Manchester, in her talk **'Results direct to patients – getting the language right'**. Lindsey highlighted work from previous studies showing that 16.4% of adults were identified as having poor literacy, with only 33.8% of over 16-year-olds having a level 4 qualification. This needs to be considered when reviewing our laboratory reports. Problems have been identified with the use of scientific terms, for example a lack of understanding for words such as 'gut' or 'protein', and the use of words in reports that are not in common use, for example 'symptomatic patients' rather than 'patient with symptoms', or 'beneficial' instead of 'benefit'. Lindsey recognised that when providing results to patients, diagnostic results are quite different from monitoring results and need separate discussion. How laboratory results should be reported, given they are now viewable to patients, needs consideration of how to include medical terminology in a language that can be understood. Lindsey recommended that language used should aim for a reading age of nine years and stressed that this has been found to be useful not just for those with poor literacy but for all patients when trying to understand the context of their results.

Our final talk of the session, **'Tapping into the potential for Laboratory Information Management Systems (LIMS) to improve patient care'** was given by Craig Webster, Director of Pathology, University Hospitals Birmingham NHS Foundation Trust. Craig highlighted the need to work out systems and patient pathways before introducing new LIMS

systems or the new system will not fix problems that exist. The only output from labs is information, and this is only useful when it affects patient care. Craig felt that the rate-limiting step to using LIMS systems to improve patient care won't be the technology but privacy/data-sharing concerns. Currently we are not leveraging health records and results to collect data across systems or nationally to improve patient care. Craig then went on to cover the plan to create a national pathology catalogue based on SNOWMED, with DAPB4017 the Pathology test and results standard to be replaced with DAPB4101. He relayed that the NHS App is very difficult for patients to use to read their test results due to the presence of numerous brackets and comments confusing the data and tests not being grouped appropriately. There is a need for harmonisation to bring test data together using FIHR – the global industry standard for passing healthcare data between systems – which now includes mobile and cloud-based applications. This will allow systems to be updated in future by just transfer of the database. Ways in which LIMS can contribute to patient care are by ensuring that they are patient-centred, effective, safe, contain up-to-date patient information with safer standards of record keeping. Without Application Programming Interfaces (APIs) most software could not exist, the API controls access to data. Good examples of where LIMS tools have improved patient care are available, for example the improvements in patient care from the AKI Alerts Intervention has enabled a cost saving of £732 per AKI admission with a cost-effectiveness probability of 90%. We are now considering expansion into machine learning and clinical decision support tools, for example iLFTs, and to continue to query how we can influence how our data is displayed to users.

The journey towards achieving Net Zero in the Lab

For our second afternoon session, the focus turned to sustainability and how laboratories will need to contribute to the NHS Net Zero ambition. I was delighted to introduce Helen Dent, Interim Chief Executive Officer of BIVDA, to kick the session off with **'Our NHS, Our Net Zero – how industry and laboratories can work together'**. Helen started by clarifying the difference between the terms 'carbon neutral', which means balancing out carbon emissions so there is no overall increase but includes practices such as carbon off-setting, and 'Net Zero' which requires carbon reduction from the start. Strategies for laboratories working towards Net Zero need to be realistic and accept that some areas cannot be improved in the short term, however, we should consider what can be changed now and in the future for our laboratory activities. There needs to be engagement with both suppliers and users of our services to drive change, identifying barriers to change and where we can make some quick wins, such as reviewing practices like 'just-in-time' stock delivery which requires multiple journeys. The NHS has produced objectives to apply Net Zero and social value in the procurement of goods and services which includes priorities for suppliers to reduce emissions, improve energy efficiency, reduce consumption of single use plastics and reduce waste. The main take home

Helen Dent, Interim CEO BIVDA

message is that industry and laboratories need to collaborate to achieve Net Zero for our NHS and share tools and best practice.

The final session of the day was from Dr Rob Shorten, Consultant Clinical Scientist at Lancashire Teaching Hospitals NHS Foundation Trust (LTH), ACB Microbiology Professional Committee Chair and ACB Green Champion who presented **'The first steps towards a sustainable laboratory: a great LEAF forward'**. Rob explained first that carbon emissions are measured by CO_2e or 'carbon equivalent' and include the range CH_4, N_2O, SF_6CO_2, CFCs, PFCs and HFCs and highlighted that we work in intensive laboratories processing a large number of samples, consuming a significant amount of energy, chemicals and waste. There are several sustainability tools that have been developed including the assessment tool LEAF developed by UCL. The Laboratory Efficiency Assessment Framework (LEAF) identifies seven key areas of Waste, People, Purchasing, Equipment, IT, Samples and chemicals, and Ventilation with achievement of Bronze, Silver and Gold Awards for progress in each category. Of note, Dr Shorten highlighted that 85% CO_2e has already happened before samples have arrived in the laboratory so even if unnecessary tests are rejected, the harm has already been done. This has led to initiatives such as diagnostic stewardship, or the appropriate use of laboratory testing to guide patient management and antimicrobial prescribing, to optimise patient outcomes and limit antimicrobial resistance, and improve sustainability. At LTH there has been a project to review requests for superficial swab culture for SSTI (skin and soft tissue infection), where the diagnosis is usually made clinically with a large proportion of wound swabs thought to be ordered erroneously. The aim of the project was to implement diagnostic

Dr Rob Shorten, Consultant Clinical Scientist LTH and ACB Green Champion

stewardship to review all wound swabs requested in a 16-day period, excluding requests meeting pre-accepted criteria if request for patients from paediatrics, or for burns, screening swabs (eg for MRSA), patients on antibiotics, or identified infections. Only approximately 18% of requests contained clinical details suggesting active SSTI. The project excluded 78.7% of requests, with 16% requiring telephone calls. An estimate of 8.93 kg plastic waste was prevented and 31.2 kg CO_2e, equivalent to a car driving for 132.2 miles. When the data was extrapolated for one year, this approach could save £37,600 and 3444 kg CO_2e. The implications from these findings were that up to 84% of samples are not adding value, leading to inappropriate antibiotic use. Further actions to take the project forward will be to consider electronic ordering pop-ups, with targeted education and investigated qualitative research targeting behavioral change.

We were delighted to see so many colleagues from across the ACB and IBMS attend the day's programme, with an audience almost at capacity across all the sessions, enabling a lively discussion of the topics with the speakers. Our thanks to all the speakers, attendees and to the IBMS Congress team for their efficiency in working with us to host the day. We welcome feedback from the meeting and any ideas for topics that we can develop for future programmes. ■

UKMedLab23: the veteran's view

Dr Peadar McGing, Retired Principal Clinical Biochemist, Mater Misericordiae University Hospital, Dublin, Ireland

Leeds was the venue for the 70th birthday party that was UKMedLab23. The ACB was born just three years before I was. Just as this meeting was, almost definitely, my last UK national clinical biochemistry conference, it also marked the last such conference of the 'ACB'. Future meetings will operate under 'ALM', the ACB having elected at the AGM to change its name to The Association for Laboratory Medicine.

At UKMedLab23 I had the honour of being an invited speaker. In a way, that completed my 'set' of Focus/UKMedLab participations. Since my first conference in 1986 (Glasgow) I have presented countless posters, given oral presentations as a finalist in the Ames Award (now Medal Award) and through being selected from submitted abstracts, being invited speaker at the Training Day, and of course I have attended a number of times as 'just' a delegate.

The format for this year's celebratory event was that each of the ACB's regions organised a 90 minute session celebrating some aspects of clinical biochemistry expertise in their region, with a little bit of history included along the way. My thanks to the organising committee for inviting me to speak on the topic of atypical fluids. Though now retired from the Mater I am currently moving forward with updating the ACBI's guideline booklet so this was a great push on that road following on from my on-line lectures for the EFLM Academy. The ACB covered my expenses for the day of my lecture and ACBI kindly provided me with a bursary to attend the other day. It was well worth the effort as I found the meeting really good (and let's be honest, I couldn't miss Maria Fitzgibbon getting her award).

View of Royal Armouries Museum from the River Aire. Photo: Peadar McGing

Many of the talks have been covered in a previous issue of *ACB News*. Maria Fitzgibbon gave a very impressive presentation covering a number of different aspects of inflammation. It's amazing how this has come into so much prominence over the past decade or so and how we are realising its very extensive impact on health. Definitely something to watch. Maria really did us all proud.

Naturally my choice of parallel session following Maria's lecture had to be the session from the Northern Ireland Region. Joy Ardill started in the Royal in Belfast in 1970 on a two-year contract to develop a gastrin assay. For most of the audience at her lecture this talk was a history lesson with useful learning points about neuroendocrine hormones and diseases.

Professor Joy Ardill. Photo: Alistair Fyfe

For me it was also a spur to reminiscences of the many past lectures I heard on these developments, most of which occurred during my career in the Mater. Our Endocrine lab did get a mention for the Substance P research carried out by David Powell, Petr Skrabanek and their team which also included past ACBI President Alan Balfe. One of the main points for me in Joy's lecture was the way gastrin produced by cancer is different from the usual circulating gastrin form and therefore more specific assays are more likely to miss tumours. Towards the end of her talk she summarised the huge strides made in our knowledge of peptides and neuroendocrine tumours, in terms of knowledge and ability to measure peptides, plus huge patient benefit in improved treatments. Quite uplifting.

Una Graham's very interesting talk on Carcinoid Syndrome is reported elsewhere and unfortunately due a clash of interests I had to miss Claire McHenry's talk on MEN1. The reason was I was very keen to hear Robert Barski's talk on the metabolic effects of nitrous oxide – "no laughing matter" in the parallel session organised by the Trent, Northern and Yorkshire Region. My interest in nitrous oxide went all the way back to my PhD. My work, testing my supervisor John Scott's idea, was the first to show that nitrous oxide could be used to generate a functional vitamin B12 deficiency in experimental animals (McGing *et al, Biochem Biophysical Res Com*, 1978; 82: 540-546). Fast forward many years and in the past decade there are suddenly clinical cases presenting with B12-related complications from abuse of this gas. We had cases in the Mater and so I had a special interest in Robert's talk, and had a good chat with him afterwards.

Nitrous Oxide (N_2O) was discovered by Joseph Priestley in 1772 and has many modern uses. In medicine it has been used mainly as an analgesic anaesthetic while in industry its uses vary from rocket fuel to culinary. For the latter it has a use in baking and for that purpose one can buy small 'whippits' to expel the gas and foam cream. These can easily be bought on-line and that has led to an explosion in recreational drug use of N_2O. Unfortunately prolonged abuse of nitrous oxide can lead to Subacute Combined Degeneration (SACD) of the spinal cord. That's because of the inactivation of B12 by N_20. The gas converts the Co^+ active form in B12 to inactive $Co3^+$ form. Over time B12 falls to deficiency levels.

Robert Barski told us their unit saw 27 cases of nitrous oxide toxicity from July 2021 to June 2023. Although young

Robert Barski. Photo: Alistair Fyfe

(age range 16-34) most have severe neurological symptoms, with many unable to walk. He told us that in these cases total B12 assays are of very limited use but that B12 functional assays MMA and homocysteine are useful for diagnosis and monitoring response to treatment. He finished up telling us that an excellent clinical guideline is available for diagnosis and treatment of nitrous oxide-induced SACD, an open access 2023 paper by Parry *et al.* (**https://pn.bmj.com/content/practneurol/23/3/222.full.pdf**).

The afternoon began with an excellent Impact Award Lecture by Professor Tim McDonald. I also took in an interesting look at Past, present and future of specialist endocrine testing, delivered by Karen Smith as part of the Scotland Region and then use of clinical decision support in patient test pathways delivered by Kat Mordue in the South West and Wessex Region session. So a good mixture of old and new and also time to view the many posters on display and talk to some of the industry reps. After all that it was back to the hotel, time for a stroll around the area, and then on to the birthday party (officially designated in the programme as Conference Reception). At the meal we had a great time at our Irish table with a mix of delegates from both of ACB's Irish regions.

After a good night's sleep, and a hearty ('condemned man') breakfast I headed across the square to the Royal Armouries Museum. The lecture theatre was empty as I checked my slides and made one last update, but when we started (on time, thanks to Bren) it had filled up very considerably. Although clearly biased, I thought the Republic of Ireland session was very good, and the feedback afterwards reflected that. Reports on that session are carried elsewhere, but I do

The Irish at the ACB70 dinner. From left to right: Ciara Cunning, Eleanor Hanna, Kirsty Spence, Graham Lee, Maria Fitzgibbon, Brendan Byrne, Gareth McKeeman, Peadar McGing and Wendy Groenendijk. Photo: Alistair Fyfe

Peadar McGing visiting commercial stands. Green labs supporters may note the re-used ACBI'98 conference bag. Photo: Alistair Fyfe

want to mention Joe Duffy's excellent talk which gave a clear picture of what can be achieved with these new ctDNA cancer markers but also rooted us firmly in reality.

I attended one other lecture in the morning, Blood science standardisation, why bother? delivered by Catherine Bailey and Rachel Still as part of the Myths, legends, and WLIMS session run by the Wales region. This is reported elsewhere but it's one that I'd love if a lot of people back in Ireland could have heard. I've watched for more than half my career the continued failure to produce a national lab IT system. Wales has managed that big step and this talk was about standardising test reference ranges, comments, etc. Lots of problems, tweaks, compromises where absolutely necessary, and hard push when no good excuse not to. Local arguments/ arrangements were one of the biggest obstacles. With PSA, for example, 'reference' ranges had been agreed but report comments and follow up protocols were only standardised with the intervention of two UK National Urology groups.

Overall on the Wednesday morning I was mostly unwinding after my own lecture so I visited the commercial stands and enjoyed a good chat with a few people, and also read a good number of posters. To me the posters are nearly always the highlight of this meeting. After sitting down for a while with my buffet lunch I took my tea and dessert back around the posters. As an aside I must mention that the food was very good, and I was never hungry, but they must have engaged some caterers from the continent to do the teas as they had no inkling that tea should be hot.

During my visit to the posters I talked to Kelly Foley at her poster, which happened to be on one of my pet topics, namely serum/plasma calcium. We also availed of the opportunity to do some ACBI business as part of the handover of the ACBI Secretary job. Then I headed to the Interactive Clinical Cases Presentations, coordinated under the chairmanship of the larger than life Danielle Freedman. I first met Danielle in the social setting of a bar at an ACB Training Course when I was the Republic of Ireland Region's 'Junior Liaison Representative', now termed

Kelly Foley with her poster. Photo: Ciara Cunning

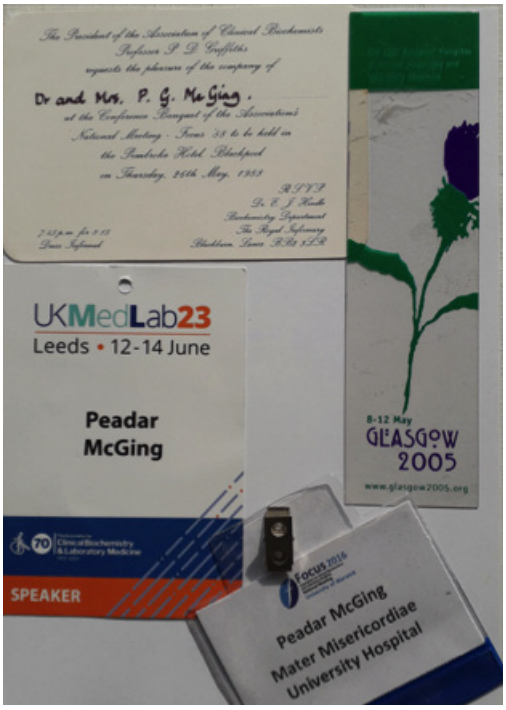
Professor Danielle Freedman. Photo: Alistair Fyfe.

Trainee Rep, and she made quite an impression. She has contributed hugely to our profession and I have been a particular fan of her work in communicating lab to the public, in particular the Sense about Science series (Making Sense of Testing and Making Sense of Screening – both well worth a Google). I had not enjoyed the experience of attending her interactive cases session, though I had heard great reports, so I decided this would be a good way to spend the rest of the afternoon. And it was, with a wide variety of cases and audience participation via phone app (unimaginable back when I was studying for MRCPath). I was happy to see that I hadn't forgotten too much clinical biochemistry, and that I could use the technology while enjoying the cases.

The meeting concluded with awards and closing remarks and then I collected my suitcase, changed from 'proper' shoes into my comfortable runners, and headed off to the bus station. Less than 40 minutes later, and a fare of just £2, I was at the airport. Of course the flight was delayed a bit, though far less than the Belfast flight, but eventually I was back home ready to enjoy a good night's sleep (and no need to head off to work the next day).

Given the cost of attending UKMedLab23 it is extremely unlikely that as a Retired Member I will be in a position to attend any more conferences. Even this year was different as I wasn't going to be going back with ideas from posters etc. So, I'm probably allowed to have a quick glance back at some past events. I didn't make it to Focus every year, but I did make a lot of the meetings.

Glasgow 1986 was my first. I enjoyed the luxury of flying, but that was because my sister was working in Aer Lingus and as she was still single it meant her brother could avail of standby travel (when she got married I was back on boat and train). I went early on the Sunday rather than take a chance on the evening flight and, having arrived early in the day, decided to throw my hand in with the local



organising crew filling conference bags. Blackpool 1988 was a highlight as I was a finalist in the Ames Award and my wife Teresa travelled with me. We travelled by car and after a week of the conference we spent a weekend in Wales on the way home. Now when the BBC's *Strictly Come Dancing* features Blackpool each year in the grand hall I can say "I gave a lecture there". Unfortunately, I didn't win the Award, that honour went to Ruth Lapworth for her presentation on 18-hydroxycortisone as a marker for primary hyperaldosteronism. Ruth has herself enjoyed a very illustrious career and is now heavily involved in ACB Retired Members matters. A fond memory from that conference was deciding to forgo Wednesday afternoon lectures and take in the optional extra trip to the Lake District. At the dinner Teresa and I sat with fellow-Dub Mike Ryan, then king of magnesium and for whom I had set up the Mater's first Mg assay before he moved to the UK. We had a great time chatting and exchanging stories and as our noise level was a bit above the rest of the ACB dinner participants we did get some funny glances.

I won't bore you with a full history of my Focus meetings which also included European and world conferences held in conjunction. Over the years, the Focus meeting went from four days to three and now to two, all plus a Training Day. Poster formats changed but the content remained relevant and for me was the main source of ideas that I brought back. Travel changed for the better, in large part we can thank Ryanair for that. The year of the volcano ash was one to remember – I was lucky enough to get to Glasgow and home on schedule but some colleagues got stuck and some speakers didn't make it to the venue. I managed to have an article about that published in the Irish Medical News. When COVID-19 came it robbed Belfast of the chance to host, and I was very disappointed about that. The online version which replaced it was inexpensive to attend and ACBI gave bursaries to 14 individuals and the newsletter got a follow-on supply of reports for the next year. But there is no substitute for face-to-face and I would encourage all ACB Members to try and attend this meeting and try and present a poster. It's worth the effort. ■

ACB News Crossword

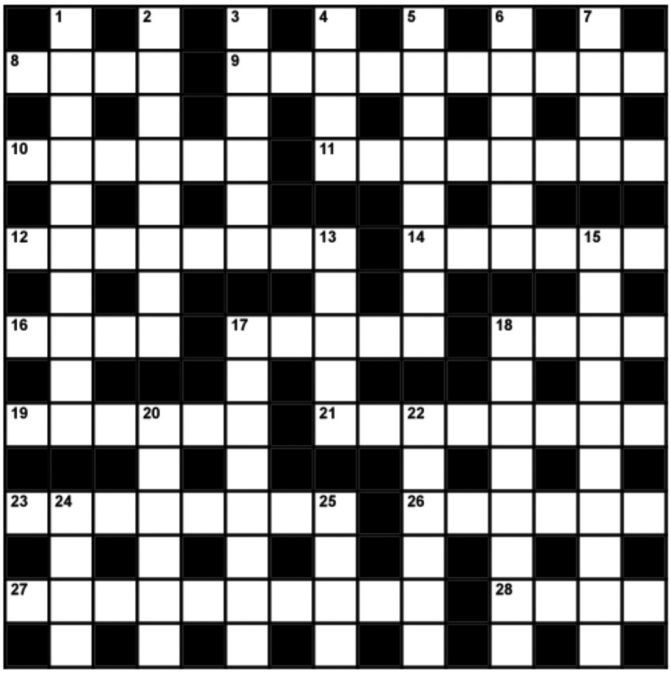
Set by Rugosa

Across

8 Fruit or bird (4)
9 Battered old car nips back first for signal transmitter derived from 27 (6,4)
10 Outline of starboard sailing vessel (6)
11 Compounds energy currents (8)
12 Individual repeats a mistake (8)
14 Harmless bantering about lacking art (6)
16 Odd Guernsey heredity unit (4)
17 Make purchases without cash for a diet-treated condition (5)
18 Deliberately holding back bitterness (4)
19 Cast off Bunyan's bog (6)
21 Surprised at contract for protease (8)
23 Identifying marks exclude many lyric poems (3,5)
26 Sickly-looking sort of tree (6)
27 Developing signal transmitter of unutterable timeless complexity (6,4)
28 Check stock (4)

Down

1 Unwell, the French group have a form of anaemia (6,4)
2 Outcome of straining, but surprisingly alert and fit (8)
3 No fret about aftermaths of chest condition (6)
4 Loose hobble (4)
5 Obvious friend upset a pleb (8)
6 Combat process (6)
7 Cheerfully holds up discharge (4)
13 Weird eye-opener in Eire turned up (5)
15 A song tells about possible causes of colic (10)
17 Organize programme (8)
18 Toxic illness that attacks the face first, spreads out in affected limbs (8)
20 Epithelial lesions present doctor clues about resistance (6)
22 Warns sweetheart about solution (6)
24 Case about stars (4)
25 Slight cut (4)



Solution for October's Crossword

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