

ACBNews

The Association for Clinical Biochemistry | Issue 571 | November 2010

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ACB News

The monthly magazine for clinical science


Number 571 • November 2010

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Front cover: Rooky Phlebotomist Jen Berg points the finger at some bad practices between phlebotomy and the laboratory ... like taking 4,000 µL EDTA blood for a HbA1c, using 10 µL for the test, then throwing the rest away after we have stored it for seven days



Focus
Association for Clinical Biochemistry
National Meeting
Harrogate 2011



Harrogate
International Centre
23 – 26 May 2011

focus on change

www.focus-acb.org.uk

Making Positive Plans for Negative

Jonathan Berg, Editor

Direct “Editorials” in ACB News are used sparingly, although readers sometimes comment they enjoy the underlying editorial line of positivity and progressive thinking, even when all around indicates an alternative position. There are lots of good things to take forward in clinical science and overall we are ideally placed to do that. We have never had such a high calibre workforce and there are lots of opportunities to apply our skill and knowledge. At the same time those that do not understand and react appropriately to the current situation of ‘UK Pathology’ may well find trouble ahead. Overall what is clearly vital is strong local and national leadership and it can be incredibly frustrating to those that want to take things forward when that is not in place.

Race to Re-Equip Offers No Protection

My friends in the diagnostics industry tell me that they have never been so busy. Laboratories are re-equipping like there is no tomorrow and seem extremely keen to tie themselves in to long contracts with equipment manufacturers, with the naïve idea it offers some crude form of protectionism. Indeed, things are so hectic that large instrument manufacturers are currently highly selective in which tenders they are responding to. One understands that some fairly large tenders are left with so few responses that the process could be brought into question which could potentially cause laboratories considerable difficulty in proceeding with procurement. The Department of Health must have wondered about offering advice to put a

stop to this almost panic buying of large analysers, but of course that does not fit with the way things are done between local and national parts of the NHS and Department of Health.

For those lucky enough to be in the middle of such tendering processes then there are reportedly very real savings to be made. This includes reduction in current reagent contract prices. This has been a key feature of budgetary control as our workload has increased but surely will eventually bottom out. New ways of working with updated analysers offers the potential for further savings in manpower costs, but the key is going to be the successful implementation so that savings are actually realised. However, for those that are installing overcapacity in a bullish approach then read on . . .

Successful Shrinking is Key

It is bizarre that laboratories are still putting in specifications for new equipment that plan for 5-10% growth per year. They clearly have not spoken to their PCTs who are at best proposing zero growth in pathology testing, and that depends on laboratories being lucky enough to retain their primary care work. Continuing such growth strategies is an admission of failure. In current corporate circles “successful shrinking” is a buzz term; for us demand management designed at offering clinically relevant testing is now crucial for our future and central to achieving the savings the Government demands. Of course reducing testing appropriately also makes NHS laboratories work much less interesting to private companies. Sensible demand management is a vital selling point for NHS laboratories if only we can demonstrate that we are actually doing it. Even key users such as Consultants in our hospital environments and also GPs are now asking us to help them stop unnecessary requesting.

tive Growth

Vitamin D Test Reduction is Easy!

Recently we have been working on demand management of Vitamin D requests from General Practice. We introduced a "12 month no repeat rule" for a vitamin D request. My staff really thought I had gone too far this time, but in fact when carefully explained to our users, it has been well accepted. Together with just one fine-tuned and targeted letter to twenty GPs we have reduced our GP vitamin D workload by 57%. With the help of the laboratory computer, together with high-level education and feedback on inappropriate testing one could easily target a reduction of 20-30% in workload across a Blood Sciences laboratory. Benefits to the patient are significant, not only in the reduction of blood we take but also in the information overload we provide to our end users with so many unnecessary and meaningless test results. As our 'rooky' phlebotomist points out in this issue, some patients are so concerned we are not getting to grips with demand management they run down the ward at first sight of the 'phlebo's trolley', locking themselves in the toilet to stop their blood being taken in the first place!

Yes, demand management is absolutely critical; it can influence every aspect of the sample journey; from the overworked phlebotomist, through the sample bench, on into the analytical laboratory, not forgetting the work of the "Duty Biochemist" and finally the end user.

To me, we must overcome the natural eagerness to point to 8-10% growth as a mark of success ... it can equally be seen as a sign of a very poorly managed service which has little patient focus.

Move to Smaller Tubes Can Save NHS Millions

The article on phlebotomy in this issue exposes a hugely wasteful approach, both in the number of requests, and the crazy volumes of blood we are still taking from patients when we only need a tiny fraction for our modern analysers. The samples on the front cover are all just about to be thrown away after 10 μ L has been taken from each 4000 μ L sample plain barmy! Indeed, after Christmas ACB News will be looking at just how much we can save by moving from the almost ubiquitous 4 mL blood tube to a 2.5 mL tube. We will experience the "sample journey" from the laboratory to the incinerator and calculate savings if 'UK Pathology' moved to the smaller tube.

So, for this issue of ACB News we offer a simple way of saving millions in pathology across the country. Reducing tube sizes from 4 mL to 2.5 mL in your hospital will save many thousands of pounds for your Trust, without any pain whatsoever. Such tubes are available and an audit we are currently undertaking suggests only 2% of laboratories are currently using them. Anyone who says that 'add-ons' or 'send aways' is a reason it cannot be done is living on a different planet. For the majority of laboratories that still have separate tubes for a full blood count and an HbA1c request then moving to one EDTA sample adds even more savings into the equation ... but of course for that to happen you do really need to surround yourselves with forward thinking people! ■

Jonathan Berg

Focus 2011 in Harrogate ... You Are Invited



With the printed version of this ACB News you will receive the Invitation to Participate for Focus 2011, the ACB Annual National Meeting. In 2011 the meeting will take place in the Yorkshire town of Harrogate, about twenty miles north of Leeds.

The meeting has a strap line of "Focus on Change" and full details of the programme can be found on the website. As well as the scientific meeting there will be an associated exhibition and also a social programme designed to ensure maximum interaction between delegates and trade partners.

Key dates for the meeting are as follows:

- ◆ **Abstract Submission Deadline:**
14th January 2011
- ◆ **Notification of Acceptance of Abstracts:**
25th February 2011
- ◆ **Early Registration and Accommodation Booking Deadline:**
25th March 2011 ■

Margaret Cutler

ACB News is sorry to announce the death of Dr Margaret F Cutler, retired ACB Member Margaret was formerly Consultant Clinical Biochemist at Dewsbury and District Hospital and also worked at Northampton General for several years. ■

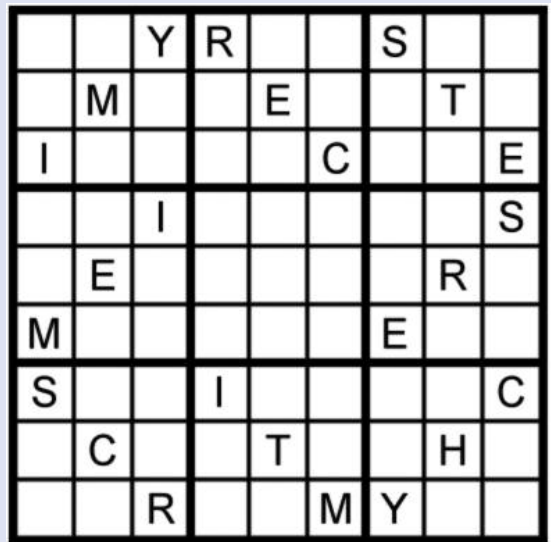
Microbiology Professional Committee

Please see page 27 for a nomination form for the new ACB Microbiology Professional Committee. The following posts are being looked for within our new Microbiology Members:

- ◆ Chair
- ◆ Secretary
- ◆ Website Editor
- ◆ Representatives of ACB including:
Education, Workforce Advisory, Trainees - Pre- and Post-Registration and Federation of Clinical Scientists, Five Committee Members

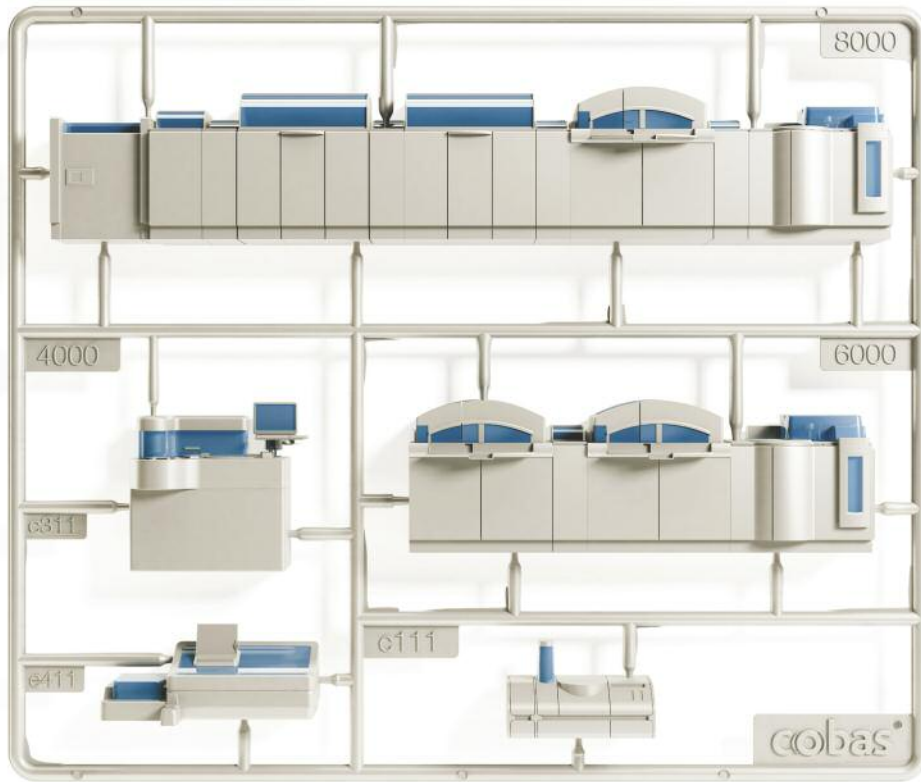
Sudoku

This month's puzzle



Last month's solution





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Safer Lithium Therapy

Readers will remember that in January we helped to publicise the National Patient Safety Agency (NPSA) alert on Safer Lithium Therapy (NPSA/2009/PSA005). This gave all NHS organisations who are involved in lithium therapy until 31st December 2010 to undertake audit to ensure that they are complying with the NICE guidance on lithium. Many laboratories will already have helped with data analysis. Key things in the laboratory to check for include:

Initial Pathology Tests: Should include liver and renal function, full blood count, blood glucose and lipid profile.

Ongoing Monitoring: Thyroid and renal function should be checked every 6 months, more often if there is "evidence of deterioration" or in the case of renal function if the patient starts taking drugs such as ACE inhibitors, diuretics or NSAIDs. Lipid profile should be repeated 3 months into treatment with closer monitoring if evidence of elevated levels. Glucose should be repeated at 3 months (at 1 month if olanzapine is also being given) and more frequently if evidence for elevated levels.

Lithium TDM Monitoring: Appropriately performed at the start of treatment and also when the dose is changed. For new starters or when the dose is changed levels should be checked weekly until stable, then every 3 months.


Since the NPSA published this alert things have moved. Andrew Lansley's "bonfire" of NHS related quangos included the announced demise of the NPSA. The bulk of the NPSA workload is expected to be subsumed by a new NHS Commissioning Board while the research and ethics functions will move elsewhere. The NPSA website gives an insight into where we are with the following statement:

"The government's transition plans for the changes which will take place across the Health Service are still under development. Until a start date for the new NHS bodies (NHS Commissioning Board and GP Consortia) is announced the NPSA is unable to make firm plans for its activities beyond the end of this year. We appreciate your understanding during the transition period."

So, while it is important to comply with the alert it does not look like anyone at the centre will be getting back to see if we have all done this anytime soon! ■

4 | General News

Safer Lithium Therapy



On 1st December 2009 the National Patient Safety Agency (NPSA) issued an action (NPSA/2009/PSA005) for all organisations where lithium therapy is initiated, prescribed, dispensed and monitored.

An Executive Director, nominated by the Chief Executive, working with relevant medical, nursing and pharmacy staff and the lead Biochemist providing services to the Trust, should ensure that by 31st December 2010:

- Patients prescribed lithium are monitored in accordance with NICE guidance.
- There are reliable systems to ensure blood test results are communicated between laboratories and prescribers.
- At the start of lithium therapy and throughout their treatment patients receive appropriate ongoing verbal and written information and a record book to track lithium blood levels and relevant clinical tests.
- Prescribers and pharmacists check that blood tests are monitored regularly and that it is safe to issue a repeat prescription and/or dispense the prescribed lithium.
- Systems are in place to identify and deal with medicines that might adversely interact with lithium therapy.
- The NPSA has developed a patient information booklet, lithium alert card and record book for tracking blood tests.

The patient safety alert and supporting information can be downloaded from the NPSA website at www.npsa.npsa.nhs.uk/alerts ■

ACB News | Issue 561 | January 2010

Election of Directors of the ACB

Nominations are called for the following elected Directors: Director of Finance, Director of Administration and Communications (Company Secretary), Director of Education, Training and Workforce, Director of Scientific Affairs, Director of Clinical Practice and Director of Regulatory Affairs.

These posts are for a maximum term of five years commencing at the AGM in 2010. All the current Directors are willing to continue for a further term of office. Nominations for these positions, duly countersigned, should be made on the nomination form in this issue of ACB News and sent to: ACB Administrative Office, 130-132 Tockley Street, London, SE1 1TU.

Closing date: 26th March 2010. ■

Sudoku

This month's puzzle

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

Last month's solution

R	Y	S	C	T	I	E	H	M
E	T	C	Y	M	H	R	S	I
I	M	R	S	E	Y	C	T	
Y	C	R	I	H	T	S	M	E
M	E	I	S	C	H	W	H	T
H	S	T	E	R	M	I	Y	C
S	R	Y	F	E	O	G	M	I
T	I	M	H	R	C	R	C	E
C	H	E	M	I	S	T	R	Y

Menarini Diagnostics Symposium

HbA1c and Haemoglobinopathies

Keble College, Oxford 16th – 17th December 2010



Menarini Diagnostics

invites you to attend our Scientific Symposium on 16th and 17th December.

We are putting together a wide and varied scientific agenda, which will reflect the increased interest in HbA1c and Haemoglobinopathies in the UK and Europe.

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New U.K. study published – please contact me for details

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Coming Next Month

It has been a busy year and some would feel a difficult ending with the spending review, emphasis on QIPP in Pathology, not to mention strong opinions published within these columns.

The December issue rounds things off nicely and includes an introduction to our new ACB News Associate Editor, Derren Ready. ■



Nominations for Awards Focus 2012

Nominations are invited for Awards to be presented at Focus 2012 in Liverpool.

The ACB Foundation Award

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

The ACB International Lecturer

This Award is used to finance the visit of an international speaker to the national meeting to recognise work that has been of major importance to clinical biochemistry – in practice, research or in education.

Full details of the Awards and the nomination/selection processes are given in the 2010/11 Members' Handbook (please note that the structure of the Awards has changed in the last year).

Written nominations for each of the above Awards are sought from a proposer and two seconders, who are Members of the Association (excluding elected Members of Council). Nominations must be accompanied by a supporting statement outlining the nature of the contribution made by the nominee and the reasons for consideration for the Award.

Nominations should be sent to Mr Ian Hanning: Email: ian.hanning@hey.nhs.uk, ACB National Meetings Secretary, Department of Clinical Biochemistry, Hull Royal Infirmary, Anlaby Road, Hull HU3 2JZ.

Closing date 28th January 2011. ■

Deacon's Challenge

No 114 - Answer

100 serum samples from healthy individuals were analysed in order to determine a reference range for a new analyte. The data were found to be significantly skewed so a logarithmic transformation was used to derive a 95% confidence interval of 20-100 nmol/L. What is the probability of obtaining a value of 116 nmol/L or greater from a normal subject? Values of the normal deviate (z-score) and P are:

P(%)	10	5	2	1	0.2	0.1
z	1.65	1.96	2.32	2.58	3.09	3.29

Since the data are skewed the first step is to convert the reference range to logarithms then calculate the mean and standard deviation in logarithmic units:

$$\log_{10} 20 = 1.301$$

$$\log_{10} 100 = 2.000$$

The 95% confidence limits cover the mean $\pm 1.96SD$ i.e. spans $2 \times 1.96 = 3.92 SDs$

$$\text{Therefore } \log_{10} SD = \frac{2.000 - 1.301}{3.92} = 0.178$$

The *mean* is the average of the upper and lower limits:

$$\log_{10} \text{Mean} = \frac{2.000 + 1.301}{2} = 1.651$$

(N.B. logarithms do not have units)

Finally calculate the z-score for 116 nmol/L – remembering to first convert it to a logarithm:

$$\log_{10} 116 = 2.064$$

$$z = \frac{2.064 - \text{Mean}}{SD} = \frac{2.064 - 1.651}{0.178} = \frac{0.413}{0.178} = 2.32$$

A z-score of 2.32 corresponds to a probability of 2% i.e. a value of greater than $2.32SD$ or less than $-2.32SD$ will be obtained on two occasions out of every 100 assays of specimens from normal subjects. Therefore one half of this, i.e. 1% of results will be greater than $2.32SD$ above the mean (corresponding to the analyte concentration of 116 nmol/L).

Therefore probability of obtaining a value of greater than 116 nmol/L from a normal individual = **1% (i.e. 0.01)**.

Question 115

Calculate the measured plasma sodium concentration if blood with a true plasma sodium concentration of 140 mmol/L is mistakenly drawn into an 'anticoagulation' Vacutainer tube.

These tubes originally contain 0.5 mL trisodium citrate solution (citrate concentration 0.105 mol/L) and the final volume of anticoagulated blood is 4.5 mL. You may assume that the sodium measurement is analytically correct.

FRCPath, Spring 2010

A Fresh Look at Phlebotomy

Jennifer Berg, Student Doctor, Sheffield University

Jen Berg takes a Sideways and Eye-Opening Look at Phlebotomy

This summer I finished my second year of Medicine in Sheffield. Near to year end, I completed my course on venepuncture training but did not get a huge amount of experience on the wards. So, I decided to contact the Phlebotomy Department at City Hospital, Birmingham, and ask if it would be possible to gain some more experience in Phlebotomy with them. I saw it as a good opportunity to learn more about the practical skills in venepuncture and also to gain a good understanding of how the whole phlebotomy system works. I spent nine full days as a Trainee Phlebotomist, taking blood samples from patients on the wards, in the Outpatient Centre and in a GP surgery and learnt a lot in the time I had. I thought ACB News readers might be interested in what I found.

Patients First

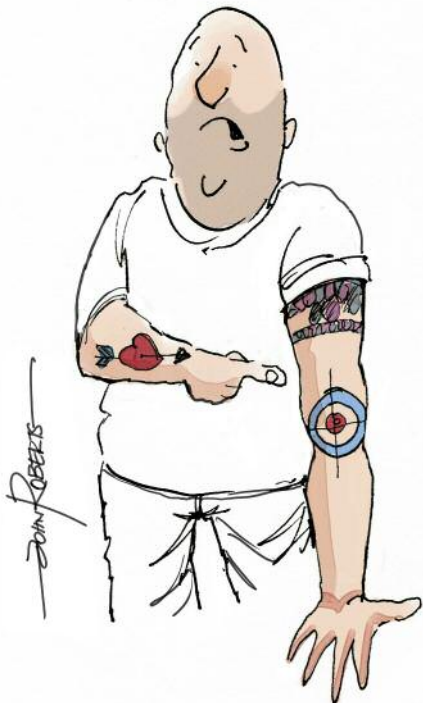
I doubt that there are many people that enjoy having a needle stuck in their arm and several tubes of blood removed. Most patients understand it needs to be done and just accept it. However, for many patients they clearly dread seeing the white-coated Phlebotomists wheeling round their red trolleys. Patients can disappear to the toilet for a rather long time when they see us looking in their direction, some never to return. A regular response I heard was "I've had too many needles, I can't stand anymore." When you look at their arms you can tell they're not lying. Often their arms are covered in bruises, left-over marks from plasters and very sore skin. I discovered that some patients have blood tests at least every



Suki, Jen and "PK" have a few issues in Phlebotomy

two days. As patients often have a cannula in one arm they can only have blood taken from the other. If a patient is in hospital for a week that means they could have around 4 bloods taken from the same vein.

Each blood tube holds 4 mL of blood and many patients seem to have at least 50 mL of blood taken per week. How significant is this amount? Some patients can be in hospital for months at a time. For example, I saw some patients, particularly on the stroke ward who had been there for over six months. The question I wondered was: "Do they really need all this blood taken? Four mL EDTA for a HbA1C, 4 mL for a U&E,



**I'VE BEEN BLED SO
OFTEN I GOT
A NEW TATTOO**

4 mL for FBC. Surely modern analysers these days don't need such large amounts of blood?". For a week as an inpatient such phlebotomy blood loss perhaps doesn't do harm, but others have pointed out that for certain long-stay patients phlebotomy blood loss can be significant. Though not considered to be a significant problem, the cost of disposing of excess biohazardous material was alluded to (Wisse *et al.* Blood loss from laboratory tests, *Clin Chem* 2003; 49: 1651-55).

What Does Pathology Do With All That Blood?

I ventured into the Pathology Laboratory one Sunday afternoon to investigate for myself what they actually did with all the blood us Phlebotomists were taking. Firstly, I investigated the Clinical Biochemistry Department's fridges, close to their main

analysers. With over 30,000 samples to consider, 8,000 per fridge, it quickly became clear that only a tiny fraction of the blood we had taken on the wards and in the clinics had been used for analysis. Most of the tubes looked exactly as if I had just filled them. Apparently the laboratory analyser uses about 25 μL for the average six tests done on each sample. So, out of the 4,000 μL I had taken in the biochemistry "ocre" coloured tube 3,975 μL was being disposed of into a yellow bag a few days later. Even worse, in the HbA1c Laboratory I found they only used 10 μL of the 4 mL sample and so 99.75% of the sample was destined for a trip to some incinerator in Redditch! Worse still, I noticed they did not actually even need the sample in most patients as the "FBC" sample would have been just as good if only the laboratory politic and working practices would allow this to happen. Even in Haematology, Damien, the on-call Haematology Biomedical Scientist, confided that they only used 15 μL of their 4 mL sample except for the few samples from which they carry on to make a film ... which uses a few μL more.

Phlebotomy is Easy . . . Discuss

After nine days working full time as a Phlebotomist I had recognised some key challenges. Granted, I was still learning and training, but there is a lot more to the job than I expected. Firstly, there's the tedious task of checking the name, date of birth and hospital number of each patient. Sometimes patients didn't even have a hospital tag on them so you had to wait for a nurse to put one on. One patient on the wards told me her birthday was in March but her tag said May. She'd been in hospital for three days and no one had noticed this error. Surely this could affect her results from previous blood tests or mean that previous and present tests would not be associated on the hospital computer? Another time a patient came down from Outpatients to have his blood

taken. When I checked details on the form it turned out he had completely the wrong person's form. If I hadn't checked his details this could have had severe consequences to the patient's wellbeing.

Informed Consent

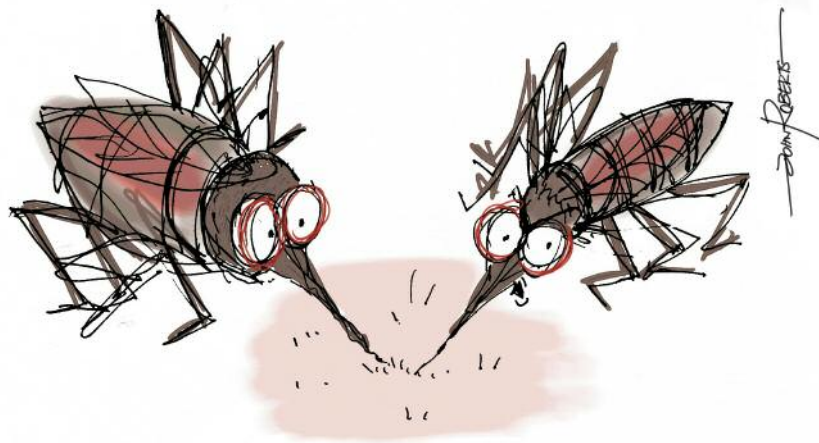
Then there's the problem of gaining consent. Some patients don't speak any English. On occasions I found myself struggling to explain my intentions by pointing at the needle and making an OK sign with my hand and checking they didn't have any objections by further non-verbal communication. On the stroke ward many patients couldn't speak at all or were barely awake. I struggled to see how it is possible to gain appropriate consent from these patients. There are also many patients who simply refuse to have their blood taken, usually sick of having so many samples taken already, as evidenced by their multiple puncture sites and bruising. On a few occasions I even went to take blood off a patient and they were about to, or had already gone home. So why had I been sent to get blood from these patients? Certainly the feeling was that

some patients had bloods taken too frequently without clear clinical need.

Psychological Phlebotomy Issues Need Consideration

Not only is this wasteful blood taking a possible health risk to long-term patients who may actually be compromised by the amount of blood that is taken, unnecessary blood taking also affects patients psychologically. Many of them are frightened of needles and dislike and react very badly to so much blood being taken. One patient I went to take blood off was very confused, didn't know where they were and firstly agreed to me taking their blood. Then, when I went to put a needle in their arm the needle was pushed away and the patient asked me what on earth I was doing. One patient looked at the samples I had taken, said: "Too much blood" and tried to grab them off me. There was another patient who the nurses were surprised let me take his blood, as he had tried to bite the arm of a Phlebotomist the previous day!

In just my nine days of Phlebotomy many patients showed concern and queried the



***PHLEBOTOMISTS TAKE HUGE AMOUNTS OF
HUMAN BLOOD, RISK INFECTION, USE A TINY
AMOUNT OF IT AND THROW THE
REST AWAY!!!!***



**HAVE YOU LOT EVER CONSIDERED
TAKING UP ACCUPLUNCTURE?**

amount of blood samples we take from them. Others are simply sick of being poked and prodded at all times of the day and night. No-one seems to be looking at this issue in a joined up way and patients are suffering as a consequence.

To me, psychological aspects of phlebotomy simply have not been given adequate attention.

Control of Infection Issues

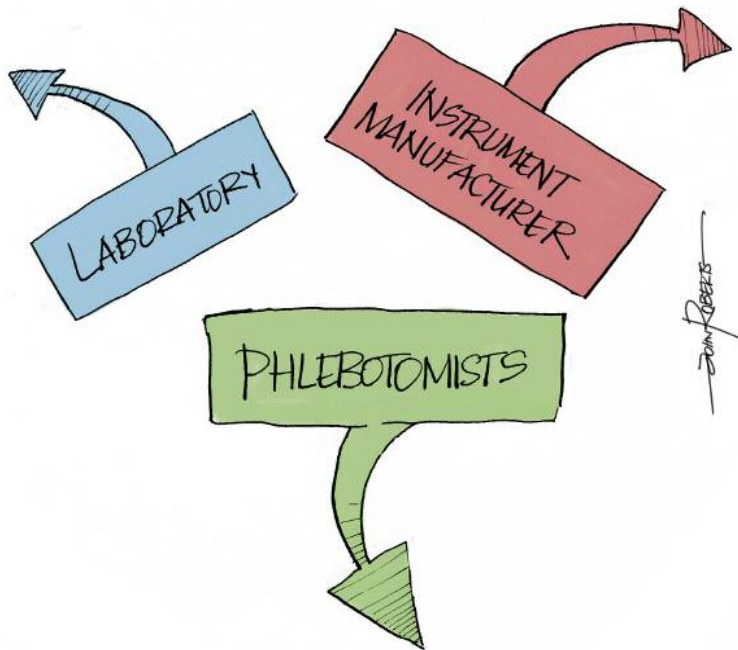
There is an increasing emphasis on phlebotomy hygiene, but this comes at a considerable price in both time and consumables. Firstly washing my hands, then putting on rubber gloves with difficulty, followed by an apron all takes time. Correct protocol now includes using a disposable tourniquet and leaving it with the patient on the ward for future use. In reality these disposable tourniquet things are rubbish before you start. They are essentially a large blue rubber band which you're supposed to tie round the patient's arm instead of a traditional tourniquet. If they don't break when you tie them they often pinch the arm and rip out the hairs on patient's arms. Even worse they don't seem to have a huge effect on bringing up the veins compared to the traditional version, which is after all their function. It turns out there are some better disposable tourniquets which have ratchets on which would be much easier to use. However,

these cost four times as much. It did strike me that if infection control is so important wouldn't it be worth investing in disposable tourniquets that would actually be usable? There are clearly difficult choices between cost and effectiveness.

The actual blood-taking procedure takes a lot of practice and time to get the hang of properly. In young adults with easy veins phlebotomy can often be straightforward. In others, especially in patients with difficult to find and bleed veins, such as oncology patients or the elderly, things are much more difficult. In the Outpatient Clinic there was open access to GP patients. Many patients who attend the hospital phlebotomy clinic from their GP practice have already had several failed attempts at taking their blood by the surgery nurse. Clearly the hospital Outpatient Clinic is used as a last resort when the GP surgery has failed. Perhaps the Pathology



**ARE YOU STILL CONSTIPATED
MRS HUGHES OR ARE WE JUST
HIDING FROM THE
PHLEBOTOMISTS AGAIN?**



A FLOW DIAGRAM OF HOW THESE THREE WORK TOGETHER.....

Department should charge a premium for such situations?

Reducing Error Rates and Recalls

There is a huge difference between the traditional handwritten request forms and computer printed forms or even better phlebotomy booked by "Order Comms". Printed sticky labels for the blood tubes save a huge amount of time and make the five minute target for each phlebotomy episode almost obtainable.

Many of the mistakes made in Phlebotomy are due to taking blood in the wrong tubes or completely missing tubes out. It's not surprising that such mistakes are made when you try to read the barely legible writing on many of the hand written request forms. Often tests are written in the wrong places on the form. HbA1c needs to be in a different tube to the clinical chemistry, but is often scribbled between U&E, LFT, Ca etc and is very easy to miss.

Increasing the use of IT and hand-held computers and scanners would not only speed up work for the person making the request, but would also hugely reduce the amount of errors and recalls that are made because of problems in the phlebotomy service.

Crazy Waste of Blood Must Stop

I really enjoyed my experience as a Trainee Phlebotomist. After only a few days I had learnt so much and improved my skills and knowledge. Phlebotomy is much more complex than I first realised when being trained at Sheffield University and practising on a handful of patients. The ward and outpatient clinic can be very different phlebotomy environments and the five minute target for each phlebotomy episode is a real challenge and pressure in both of these environments.

Issues of patient dignity and informed consent worry me and I am not surprised that a number of patients query how much

blood we are taking... they do not call us "vampires" in jest, as we approach with our red trolleys down the ward. Having visited the Biochemistry Department my worst fears were confirmed; modern analysers use only a tiny fraction of the blood that is taken, with the size of tubes seemingly coming from a different era. We are taking 4 ml of blood into a tube when clearly 1 ml, perhaps with a redesigned tube with a narrower diameter, would be fine. Equipment manufacturers, Phlebotomists and the laboratory appear not to be joined up in all this. The result is a huge amount of blood is taken that does not need to be, with potential consequences all along the line for patient wellbeing. It is also wasteful use of hospital and indeed the world's resources. ■



"Why do you make us Phlebotomists take 4 mL of blood then throw 99% of it away 7 days later?"

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Poisonous Crabs by The Rhine

Samantha King, Barts and the London

The 48th Annual Meeting of the International Association of Forensic Toxicologists (TIAFT) 2010 in Bonn, Germany

The first full day concentrated on alcohol, drugs and driving. A German study addressed problems regarding the clinical specificity of carbohydrate deficient transferrin (CDT) to chronic alcoholism and compared it to a proposed LC-MS/MS method for phosphatidylethanol (PEth) homologues using liquid-liquid extraction. PEth homologues were better able to distinguish an alcoholic population from that of social drinkers when compared to CDT, which highlighted the

potential future application of PEth in driving licensing procedures.

Drug-facilitated crime was introduced by Marc LeBeau who presented an eye-opening, "investigation of the role of variations in growth rate and sample collection on interpreting results of the segmental analyses of hair." Segmental hair analysis in criminal toxicology has been widely reported in the literature; yet, it assumes that hair growth rate is 1 cm per month for every individual and that the hair is cut next to the scalp. In reality, inter-individual and seasonal growth rate variation, shape of the head, sampling location and the use of scissors means that neither assumption is true. This has introduced massive uncertainty when determining time-scales in criminal toxicology. Hence the reliability of segmental hair analysis must be questionable in a court of law.

The image shows a woman with long dark hair and bangs, wearing a white shirt and a dark vest, standing next to a large scientific poster. The poster is titled "An LC-MS method to measure cathinone, norpseudoephedrine and phenylpropanolamine in urine" and lists authors Samantha King, Molly Zaman, Frances Flores, and Sally Benton. The poster includes an introduction, a table of retention times, and a discussion section.

An LC-MS method to measure cathinone, norpseudoephedrine and phenylpropanolamine in urine

Samantha King, Molly Zaman, Frances Flores, Sally Benton
Department of Clinical Biochemistry, Barts and the London, NHS Trust, London, E1 3BS

Table 1. Retention Times

Substance	Retention Time (min)
Cathinone	1.10
Norpseudoephedrine	1.15
Phenylpropanolamine	1.20

Discussion

- Concentrations obtained from regular urine donors were different to those reported in previous studies.
- The methodology in the measurement of cathinone has been described, allowing more accurate urine analysis and is required to be developed following the strict Regulation of Medicines in the UK.
- Norpseudoephedrine and phenylpropanolamine are found in some systems, and development of methods for their measurement is required.



Psychotic Effects of Anabolic Steroids

An investigation to assess the psychiatric effects of anabolic steroid concentrations on the brain followed on from divergent reports of the behavioural effects of these compounds. Concentrations of anabolic steroids in the brain of a deceased bodybuilder were analysed by LC-MS/MS following solid phase extraction. Trenbolone and boldenone were found to easily cross the blood-brain barrier and their characteristic metabolites were detected. Similar concentrations of the synthetic steroids were found in the brain and blood and there was no evidence of transformation to neuro-active steroids. It was found that many synthetic steroids were not suitable for biotransformation into neurosteroids (unlike testosterone) providing some evidence for a lack of behavioural effect.

I presented my poster, "An LC-MS/MS method to measure cathinone, norpseudoephedrine and phenylpropanolamine in urine" in the afternoon coffee break. A new cohort of samples from regular khat users was analysed. This cohort had not previously been reported and we found higher concentrations of cathinone and its metabolites than was

expected according to previous studies in the literature. The assay was developed due to the high prevalence of khat users local to the Royal London Hospital, and the detrimental psychological effects of the drug.

Un-starved Coconut Crabs

A oral presentation by Marc Deveaux highlighted an interesting case of mystery poisoning in New Caledonia. Four lethal intoxications occurred following symptoms mimicking digoxin toxicity. None of the young victims were found to be taking cardiac glycosides or to have eaten the poisonous fruits of the local *Cerbera manghas* (false mango) tree. The mystery was solved when it was discovered that the young victims had all eaten a local delicacy, the *Birgus latro* (coconut-crab). According to local folklore you only eat the meat once the crabs had been starved for several days and emptied their intestines. LC-MS/MS analysis of the victims, crab intestines and fruit of the false mango tree all detected the cardiac glycoside, neriifolin, suggesting that these victims had eaten un-starved coconut crabs which had been feeding on the fruit of the poisonous tree. Auf Wiedersehn! ■

High Sensitive Troponin T: A Consensus View

Martin Myers and Rebecca Allcock, Preston

Two important guidelines relevant to the biochemical investigation of patients with acute chest pain have recently been published.

They are the Universal Definition of Myocardial Infarction (UDMI)¹ and the NICE Clinical Guideline 95, Chest Pain of Recent Onset.² The UDMI requires a rise and/or fall of cardiac troponin in patients with symptoms of cardiac ischaemia or ECG changes, with at least one value above the 99th percentile of the upper reference limit. The assay should have a coefficient of variation (CV) of <10% at this level. The Roche Elecsys high sensitive troponin T (hsTnT) assay meets these performance criteria (10% CV is at 13 ng/L, the 99th percentile is 14 ng/L) and is now being introduced in laboratories throughout the world. However, with both guidelines there is potential for different local practices to be adopted and so in June this year a meeting was arranged in Manchester between Clinical Biochemists and representatives from Roche to discuss the use of hsTnT. Dr Evangelos Giannitsis, Professor of Cardiology at the University Hospital, Heidelberg, gave a comprehensive overview on the evidence based use of hsTnT and after reviewing the evidence the group reached a consensus on the practical use of hsTnT. This report outlines the consensus view of the group.

1. It was agreed that the reporting units for hsTnT should be ng/L. This would allow results to be reported in whole numbers, avoiding any confusion caused by units such as ng/mL that require 3 decimal places.
2. It was agreed that results should be reported down to the limit of the blank (3 ng/L) to enable assessment of changes between consecutive samples even when the initial result is below the 10% CV.
3. It was agreed that two measurements of hsTnT are required in the assessment of patients with chest pain. Whilst it is acknowledged that some hospitals may find it difficult to fund two troponin measurements, such hospitals would find that they are at odds with NICE and may be vulnerable to making wrong diagnoses if only one troponin was measured. A single Troponin level can be elevated due to causes other than myocardial infarction and there is a risk of a false positive diagnosis of MI with single measurements.
4. NICE and the UDMI differ in their recommendation of when the two Troponins should be measured. Both agree that the first measurement should be at presentation. However, UDMI recommends that the second sample should be measured **6-9 hours after presentation**, and NICE recommends that the second sample be measured **10-12 hours after the onset of symptoms**. The group agreed that the timings recommended by the UDMI are more defined and that relating the second sample to onset of symptoms (as in NICE) may cause confusion due to large variation in the time elapsed between the acute event and presentation. In addition it is not valid to use a variable time interval between samples when the diagnosis depends on a defined incremental rise. The group therefore agreed to recommend the UDMI guidance on the timing of the second sample. This means that rule in and rule out can occur at 6-9 hours post presentation. However, if the second sample does not show an incremental rise, yet clinical suspicion remains, then a further sample should be taken at 12 hours after presentation.

5. There was significant debate regarding what constitutes a significant increase in the second sample. NICE refer to the UDMI but these guidelines are unclear on the rise expected. UDMI used the analytical imprecision of the assay to conclude that a significant change is 20% in reinfarction. However, Professor Giannitsis outlined the impact of biological variation in hsTnT and stated that taking into account analytical and biological variability, a 100% change should be considered as significant. Using a 20% increase will give greater sensitivity but will result in reduced specificity, whereas a 100% increase will reduce the sensitivity but increase the specificity. The balance between the sensitivity and specificity of a test is a common issue, and in this instance the decision may be related to what the local clinical pathway is. Many cardiologists may prefer the 20% change (high sensitivity) and would then further investigate patients with small changes in hsTnT. However, there would be a concern if further investigations were not undertaken and the 20% rise was seen as diagnostic, then false positives would occur. At a follow up meeting in Cardiff, this dilemma was debated further and the group agreed that there should be three decision categories:
- a: Less than 20% change: not consistent with an acute event
 - b: 20-100% change: Significant rise in hsTnT, suggest further evaluation to distinguish between acute causes and chronic elevation in hsTnT.
 - c: Greater than 100% change: consistent with myocardial infarction.
6. It was emphasised that high levels of hsTnT can be used for risk stratification in both acute coronary syndrome (ACS) and non-ACS patients. Patients with chronically elevated hsTnT (>14 ng/L) are at risk of future cardiac events and should be followed up.
7. No conclusion was reached on what single level of hsTnT could be used to diagnose an MI and further work on this is required.

The Manchester consensus was based on the evaluation of current data in order to recommend a unified approach in the biochemical evaluation of chest pain. It is recognised that as evidence accumulates, practices may change accordingly. However, a consensus approach is preferable to multiple local practices.

References

1. Thygesen K, Alpert J S, and White H D. Universal Definition of Myocardial Infarction. *J Am Cardiol* 2007; **50**: 2173–95
2. NICE Guideline 95. Chest pain of recent onset: Assessment and diagnosis of recent onset chest pain or discomfort of suspected cardiac origin. 2010.

ACB Update Session Nutrition, Fluids & Bones

Royal College of Pathologists, London
10th December 2010

Programme includes:

- Nutrition and Fluids
- Bone Disease

For further information please look at the ACB website meetings section



Siemens CardioPhase hsCRP



Siemens has introduced ADVIA® Chemistry CardioPhase hsCRP assay, consolidating specialist cardiac testing onto routine high throughput analysis.

The assay is aimed at cardiac risk assessment and stratification. The results exhibit excellent correlation and similar performance to the Siemens BNII Nephelometer.

CardioPhase hsCRP is now available on chemistry and immunology laboratory analysers as well as point of care. ■

The glasses are not obligatory when running the new CardioPhase hsCRP assay!

Beckman Coulter REMISOL Advance Joins Systems Together

Beckman Coulter's new REMISOL Advance data management system links analysers and laboratory information systems through a single workstation, providing a comprehensive real-time view of the clinical laboratory activity. The new system is capable of managing Beckman Coulter instruments, including automation, chemistry, special chemistry, integrated systems, immunoassay, haematology and haemostasis platforms. New interfaces to Beckman Coulter's AU Instruments, DxH systems and ACL TOP systems. Utilizing the new Wide Area Networking and Local Area Networking configurations, it simplifies and streamlines workflow, enabling technicians to programme and review test requests for all interfaced

instruments. Your local Beckman Coulter representative can give you further details. ■



A Mentor and Friend

David Bryn Williams 1948 – 2010

David Williams, born 19th October 1948 died unexpectedly 3rd June 2010 after a short illness, not long after he retired. His death came as a shock to our laboratory, at City Hospitals Sunderland, where he worked for 24 years. We received many letters and calls from colleagues with affectionate memories.

David, or Dai as he liked to be known, gained his MSc on Tom Whitehead's West Midlands course in the early 1970s. Dai obtained a post at Northwick Park where he undertook research leading to his PhD thesis on intestinal alkaline phosphatase. Promotion to Principal Grade took him north to the Royal Victoria Infirmary in Newcastle and shortly thereafter, in 1984, he filled Paul Trinder's vacant post in Sunderland.

David took his role as Clinical Biochemist in the community seriously. He was an active member of the ACB serving for many



years as the Regional Representative on the old Regulating Committee and was a former Chair and Secretary to the Northern Region committees. He participated as an expert witness in forensic toxicology. He was Regional Tutor for the NE England with The Royal College of Pathologists and active to promote the profession with visits to local schools and universities. He also assessed Cases for Comment. At Sunderland

he is fondly remembered as a mentor and friend to all the staff and many of us owe him a debt of gratitude for his guidance and encouragement with career development.

Outside work Dai had a deep interest in the military and reached the rank of major in the Territorial Army. His encyclopaedic knowledge conveyed with a degree of scepticism was always worth having whether on scientific, ethnographic, literary or philosophical matters, often accompanied by some apt lines of poetry. He loved good food and sought out the best restaurants around the country on his peregrinations.

Sadly, David had planned to marry his long-term partner, Krys, this year and leaves behind two daughters from his first marriage, Bethan and Hannah. Dai as we all knew him was proudly Welsh, a native speaker and patriot. ■

DB/MHSL

Cholesterol Oxidase Inventor

Bill Richmond

Whilst taking part in his annual fishing trip to the River Spey in Scotland, Bill Richmond lost his footing and tragically drowned on 18 August 2010. Bill was a Consultant Clinical Scientist at St Mary's Hospital in London from 1989 to 2006. His huge contribution to the profession was the purification of cholesterol oxidase and the validation of this enzyme in a reaction that allowed the easy measurement of cholesterol by automated instruments.

Bill was born in Springfield in Fife and attended the University of St Andrews reading Chemistry. After graduation he secured a job in the Victoria Infirmary in Fife as a Biochemist. In 1968 Fred Mitchell, the locum Head of Department at the Victoria Infirmary, was about to leave to take charge of the Clinical Chemistry Unit of Northwick Park and felt that Bill's talents were required with him in London. In 1969 Bill moved to London and worked on development of methods that could be adapted to run on automated equipment. One of Bill's projects was cholesterol and, mostly under his own judgement, was able to purify cholesterol oxidase from *Nocardia*. In addition to purifying the enzyme he was able to show that it could reliably measure cholesterol and the Chemical Engineering Unit at University College helped Bill in large scale production of the bacterium so that large quantities of the enzyme could be purified at any one time. The process was patented on behalf of the MRC, though not without some resistance, by the National Research and Development Corporation (NRDC). The NRDC original view on the enzyme and the process was that it had no commercial value! However, as a patent it provided the second highest earnings of any NRDC patent for the MRC. For this work Bill gained the award of a PhD and one of the papers published as part of this work is among the 500 most cited papers of all time.

Bill was never a brash or extrovert scientist who wallowed in his original discovery.

Indeed, internationally he was not well recognised for his ground-breaking work at the immediate time of his success. Bill was in great demand to teach about lipid measurement and standardisation and contributed to many of the UK MSc Clinical Biochemistry courses and to undergraduate teaching in St Mary's Hospital.

To know Bill properly, meant that you realised that beyond his meticulous scientific acumen, there was a man who lived life with joy. He could play the bagpipes to a standard enjoyed by few and he was a master of composing music for them. He was equally as sharp at composing poetic skits on members of staff and was renowned at Christmas parties for putting them to music, much to the amusement of all staff, particularly at CRC. Bill had a love of cars and he tenderly kept a classic Reliant Scimitar for everyday transport and a meticulously restored pre-war Riley for enjoyment. He talked fondly of the memorable opportunity of driving the Riley round the Le Mans circuit just prior to the 24 hour race. He was a Francophile with friends in France that he visited regularly and with them Bill's wife, Joan, also a graduate of St Andrews and a Microbiologist at Collindale, decided to design the "McFrog" tartan (a derivative of a Gunn tartan). Far from being a joke, the tartan is classified in the Scottish Tartans Authority and is available to buy. Bill, a man suited to the outdoor life, kept bees in the garden to produce a source of honey but this hobby was quickly removed after his wife Joan had an anaphylactic reaction to a bee sting and was lucky to survive. After the loss of his wife, boyhood pastimes such as shooting and fishing were even more important and at his funeral, his brother recounted that Bill's homemade "flies" attracted more fish than anyone else's. Bill's warmth, personality, acumen and joy of life will be missed by all that knew him. ■

BC & SS

Inward Looking and Not Patient Focussed

The articles in the September issue of ACB News reflecting different views of the spectrum of Pathology Modernisation are interesting to me for a couple of reasons, over and above the content; they are both inward looking, not patient focussed and neglect the need for innovative science.

Commissioners agree that a three day turnaround for routine work is acceptable, would patients agree? We know we can process samples much more rapidly than that. Patients I've spoken to would be keen to have that information as soon as possible and this fits with the concept that if patients actually own their results, then they may have a view on when they want them.

Great play is made in David James' letter of a pathology provider encompassing Cologne, this highlights a neglected aspect of the debate. Many countries have privatised/consolidated services that generally serve primary care and may serve some hospitals. However, in Germany, Australia, USA etc, there are University Departments of Laboratory Medicine; their role is to provide the academic environment to innovate and deliver best practice as points of referral within tertiary centres of excellence. This seems, regrettably, to be missing from any

consideration of how such centres will operate in England in the future; a hub does not necessarily equate to co-location with a tertiary referral centre.

The academic aspects of the profession are being ignored in the discussion in pathology in England as witnessed by privatisation agreements which have occurred, or are currently under debate; we and our masters should seriously think about the implications for the future practice of Laboratory Medicine in this country.

The UK, as witnessed by the latest discussion by the coalition government, seem to be willing to sacrifice the investment in scientific curiosity against savings. This is as likely to be true of Laboratory Medicine as it is with any other science. So the debate of hub versus spoke and virtual hubs and transport and computers etc, etc, etc is all very well, but we do not want to throw out the baby of value with the bathwater of cost! ■

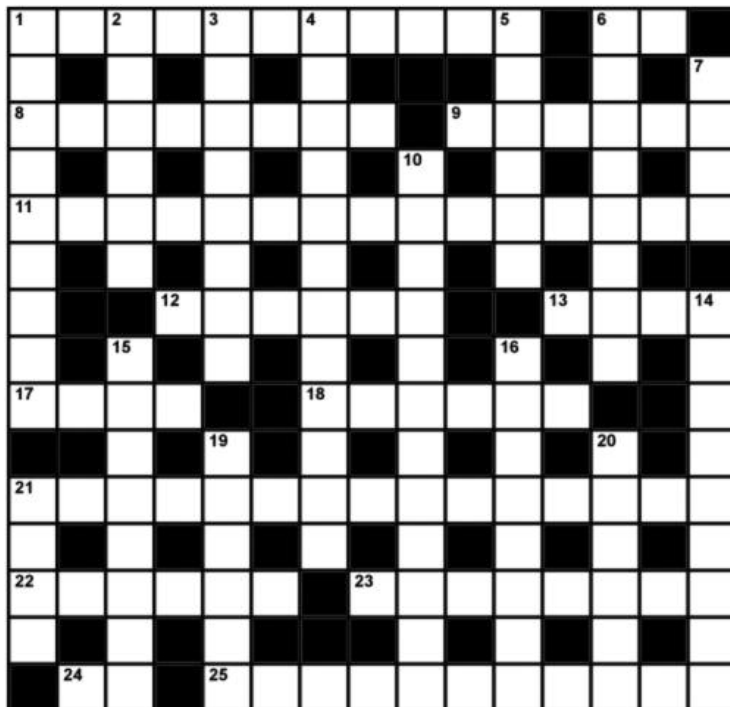
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ACB News Crossword

Set by Rugosa

Keep sane at coffee time with the ACB News Crossword. Always relating to the science and practice of Clinical Chemistry, you will never cease to be astounded by the convoluted mind of the ACB News Crossword compiler.

Prizes for your department: The first five correct solutions to appear on the ACB News fax machine (Fax: 0121-507-5290) will receive a copy of the educational Calcium Cases CD-ROM by Aubrey Blumsohn, Christina Gray, Neil McConnell, John O'Connor, Anne Pollock and Roy Sherwood which retails at over £50. Please state clearly the name and address of the Department that is entering the competition. Remember that ACB News appears first as a PDF on www.ACB.org.uk around the 7th of each month.



- 5 Period of immaturity tires out dodderly generations (6)
- 6 Contrasting unstable phosphorus isotope (8)
- 7 Retest - not needed - smear tests show tumour (4)
- 10 Covert lifting of repaired gap railings without point (12)
- 14 Mastery of dance about love on short time (9)
- 15 Vehemently dismiss minor potential problem of hydrocarbon gas (8)
- 16 Vessel of first vintage extremely new and sparkling Spanish wine (4,4)
- 19 Don't retire - but military 3 can (4,2)
- 20 Dioxide plasticises mixture, missing steps out (6)
- 21 Exceeds limits (4)

Across

- 1 Weak bonding in solution, so a cation is involved (11)
- 6 Derived from chloroform (2)
- 8 Scientific objective (8)
- 9 Samson's medical condition in Gaza (6)
- 11 Infection specialists solicit big rooms for treatment (15)
- 12 Sport involving not very quiet pink pigs (6)
- 13 Dot he-man (4)
- 17 Whites hold back a subject of cryptozoology (4)
- 18 Customs bend authorities (6)
- 21 Can list solitary process for physicochemical purification (15)
- 22 Non-atopic phenotypical group (6)
- 23 Mention facilitation without fail (8)
- 24 Represent metallic element (2)
- 25 Condensed polyoxymethylene reagent modification bears fruit (11)

Down

- 1 Go along with current crowd (9)
- 2 Employed in theatre, but upsetting theatrics are out (6)
- 3 Doctors holding up US health-related research agency for Native Americans (8)
- 4 Greedily concocted kilocalorie savoury - no looker! (12)

Last month's solution



Association for Clinical Biochemistry Microbiology Professional Committee Nomination Form 2011

Election of Members of the Microbiology Professional Committee

We, the undersigned, being Members* of the Association nominate

Name

Address

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for election as ** Chair / Secretary / Website Editor / Representatives of ACB Committees
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Federation of Clinical Scientist plus Five Members.

Nominated by

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Signature
(Please print and sign)

Seconder ACB Member Number

Signature
(Please print and sign)

I confirm that I am willing to stand for the post of

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- * Every Member other than a Corporate, Retired, Temporary Retired, Federation, or Student Member shall have one vote and is therefore entitled to support a nomination. Federation Members can nominate and vote for the election of the FCS representative. Only Ordinary Members are eligible to hold office except for the FCS representative.

This form, duly countersigned, to be returned to
The Administrative Office, Association for Clinical Biochemistry,
130-132 Tooley Street, London SE1 2TU, before **17th December 2010**



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