

Feature

AVTRW

Coping with the knowledge explosion

The annual conference of the Association for Veterinary Teaching and Research Work (AVTRW) was held in York from March 29 to 31. A keynote speech accompanied each themed session, with the topics covered including teaching, epidemiology, infectious diseases, pathology and clinical research. There was also a symposium on idiopathic haemorrhagic diathesis in calves ('bleeding calf syndrome'), a new and emerging disease. Arianwen Morris reports.

A RECURRING theme each year at the AVTRW conference is education. To introduce this year's session, Stephen May of the Royal Veterinary College (RVC) gave a keynote speech.

'All of us attached to universities may deliver lectures, supervise practical classes and take small groups of pupils for tutorials, but as various sources have shown we have profoundly different views on our purpose as it relates to student learning,' he said.

Teacher perspectives were often influenced by 'received wisdom' and individual experience rather than being supported by evidence, as was demanded in other areas of scientific endeavour.

'Some of the reasons why teachers do this may relate to what I could call, misquoting here, the "Do unto others as you have had done to you" pedagogical school of teaching,' he said.

Many teachers were focused on the transmission of information to students rather than on inspiring conceptual change and the development of new ideas.

'We could argue that if our students know a lot at the end of their courses it doesn't really matter how they came by that knowledge,' said Professor May. However, the 'rote learning' approach meant that information was less likely to become integrated.

'It can be recalled by the use of appropriate cues for the benefit of examinations and tests, but this inert knowledge tends not to be available for other uses, in particular practical applications and transfer by the students to other contexts,' he said. 'And because it's not integrated into their personal knowledge base, then it's also easily forgotten and needs to be relearned over and over again.'

He suggested that modern lecturers tended to have a similar approach to their teaching as they did to their research. While some saw research as a series of independent



Stephen May – teachers should inspire in students a commitment to lifelong learning

parts loosely related to their discipline, with the collection of information leading towards a possible breakthrough, others saw the field as composed of constituent parts with the object being to 'iterate between various levels on the subject as a whole to further develop high-level theoretical concepts'.

Teachers with the first of these two approaches to research tended to use an information transfer approach to teaching unless they were well trained as teachers and able to separate the two.

Without a deeper approach to learning, students would be less motivated to learn and more likely to perceive any barriers to participation in lifelong learning as large. The superficial learner was also more likely to become dependent on the teacher in terms of both the choice of material and their interpretation of it.

Professor May said that this approach of acquiring facts 'just in case' would work when an individual had a chance of understanding all of the important knowledge in their area and accumulating it in this way. However, he said, with the recent 'explosion' of knowledge, 'the

superficial learner is, in a sense, beaten before they start'.

He noted that in 2006, the volume of information generated and put on the web was 3 million times the information contained in all the books ever written. Deep learners would therefore need to learn to be selective in the information they sourced.

'What we ideally need is to get our balance right so that we integrate all the different aspects of our profession and ensure that our students both read the relevant material, extract the relevant knowledge from that, but also engage in meaningful activities to draw it together so that they can integrate it to the benefit of their patients, the owners and also society at large,' he said.

Motivations for learning

Vicki Dale, from the Lifelong Independent Veterinary Education Centre at the RVC, agreed that it was important to understand the factors that might affect an individual's approach to learning. She described the results of a national questionnaire to assess veterinary graduates' perceptions of motivating factors for, and barriers to, participation in continuing professional development (CPD), and to relate these to their approaches to learning.

'We found that there were three types of motivating factors: intrinsic, extrinsic and social,' she said. Intrinsic motivation represented a willingness to learn and an altruistic inner drive to better oneself to be of greater service to the profession or society, while extrinsic motivation factors were responses to external incentives – either monetary or status rewards to the individual, or an obligation to comply with external pressure.

Respondents were primarily intrinsically motivated, followed by those motivated by the prospect of social interaction with their peers. Extrinsic motivation also played a part but it was less influential.



Vicki Dale, who explained how different approaches to learning could affect participation in CPD

Regarding approaches to learning, there was a 'preference for simplicity versus a preference for complexity'.

'People with a preference for simplicity focus on knowledge as something that they take in. They expect to be told, whereas people with a preference for complexity want to be involved in the construction and use of knowledge.'

Motivating factors were positively correlated with a preference for complexity, whereas learners with a preference for simplicity were more deterred by barriers to participation and were not motivated intrinsically, extrinsically or socially. In fact, they exhibited an avoidance of social learning situations.

'The implications of this are that the approach to learning doesn't just affect the quality of people's learning while at university, but also their ability to engage in lifelong learning,' said Dr Dale.

'With information exploding at the rate that it's going at, people will need to have this preference for complexity to be able to function properly in the next century.'

Advances in CPD provision

A number of innovative methods for delivering CPD have been developed to address potential barriers to lifelong learning.

A team from Liverpool University described an online module on professional key skills that they had developed.

Carol Gray, a lecturer in veterinary communication skills, explained that the

module had been designed to appeal to vets in practice. The chosen e-learning platform allowed use of video, narrated Power Point lectures, live discussion boards and multiple asynchronous discussion boards. Assessment was ongoing and included completion of research, participation in discussion boards and formation of revised protocols.

She said that this format enabled vets with a busy work schedule the flexibility to study when it suited them and meant that potential barriers such as the cost and time of travelling long distances to attend CPD events were avoided. However, the discussion boards still allowed social interaction and enabled participants to share information and experiences.

Another member of the team, Jill Macdonald, noted that the approach demanded self-directed learning – a valuable skill in an ever-changing profession. 'It accommodates many different learning styles,' she added.

At University College Dublin, a similar approach had been taken by Diane Cashman and her colleagues, who ▶

Promoting interest in clinical research

In a session entitled 'Meet the Presidents', those attending the AVTRW conference had a chance to put questions to the presidents of the BVA and RCVS and to the Chief Veterinary Officer (CVO).

One delegate asked if there was an advantage to getting practitioners more involved in clinical research, and what kind of structures could be put in place to foster greater involvement in research.

Nigel Gibbens, the CVO, said that connecting practice to research was very important.

'We need the right sorts of projects that will connect practitioners with pursuit of science.'

Sandy Trees, President of the RCVS, agreed that there was a 'research goldmine' out there, but warned 'it's very easy to do bad research'.

It was important that guidance was provided for practitioners interested in conducting research. 'Writing of

scientific papers is something that one needs guidance to do as well,' he said.

Bill Reilly, President of the BVA, added that research should be a partnership between clinicians working in practice and academic institutes.

'I also see that the way some aspects of practice are developing – the specialisation that's going on – is in itself providing an opportunity for specialised clinical research to take place in a private clinical environment.'

But, he asked, 'Where would the funding come from?'

The discussion tied in well with a keynote speech from David Argyle, professor of veterinary clinical studies at Edinburgh University, entitled 'The future of clinical research: adapting to a changing environment'.

He said that while some would define clinical research as 'research utilising clinical material', he would argue that the

term applied to research conducted across a spectrum of basic science through to clinical cases, all with the aim of advancing clinical knowledge and translating discovery into clinical practice.

'Clinical academia is probably undervalued as a discipline. It's very difficult to recruit people,' he said. 'Where do we really start to try and put things right?'

In answer to this question, Professor Argyle suggested that reviewing the curriculum and influencing people from an early age was very important: 'We really need to inspire the next generation.'

'Students are best taught by the people at the cutting edge,' he said, adding 'There's too much reliance on junior staff for teaching.'

He said that the undergraduate research experience should be enhanced and that summer projects had done more than intercalated degrees to attract undergraduates into research.

'We need to value and respect clinical academia as an activity and a career, we need to get the right people into veterinary schools and inspire them, we need to create first-class facilities and create an environment of opportunity,' he said. 'But I think clinical research has an incredibly bright future. We've got excellent clinical tools, we've got excellent clinical facilities. We've got the complete package for really advancing clinical practice but we do need the funding and the expertise.'



AVTRW president Ronan O'Neill (left) chairs a session in which delegates' questions were answered by (from left) Sandy Trees, RCVS President; Bill Reilly, BVA President; and Nigel Gibbens, the CVO

had implemented a part-time distance education certificate in canine sports medicine.

A survey conducted by Ms Cashman had identified cost, time and access to CPD as major barriers to participation; however, many respondents felt that the social interaction from conferences was positive.

As a result, the new certificate had been developed to incorporate some face-to-face teaching in addition to online learning.

‘What was very important for the full-time practitioners was that they would rely in the long term on this group that they’d established amongst themselves to collaborate and discuss issues,’ said Ms Cashman. A second distance education programme – a graduate certificate in dairy herd health – and a range of short non-accredited online CPD courses were currently under development.

Another project making full use of recent technological advances is the ‘virtual abattoir’ being created by David Taylor and colleagues at the University of Glasgow.

‘Veterinary undergraduates have to understand the processes involved in red

meat production. This is fundamental for the issue of veterinary public health,’ he said.

A programme had therefore been created in collaboration with a 3D visual simulations company to allow students to take a virtual tour of a beef abattoir, following the animal from lairage to the chilling of dressed carcasses.

Access to abattoirs for training purposes was increasingly difficult and the package allowed students to maximise their understanding to get the most out of actual visits or work experience.

‘There are hotspots with detail showing matters of principle,’ he said, defining ‘hotspots’ as information pages of text, images and videos that were used to describe and demonstrate important activities.

‘Virtual abattoir has been constructed primarily for undergraduate teaching but it turns out to have implications and interest for postgraduate and industry training as well!’

Professor Taylor said that the virtual abattoir would be available by the summer of 2010 and would subsequently be further developed to include sheep, pig and poultry lines.



Photograph: Adrian Philbey

David Taylor, part of a team at Glasgow University working on a project to produce a ‘virtual abattoir’ for the training of veterinary students. During the conference Professor Taylor was awarded the Selborne Medal for Veterinary Research, for his longstanding contribution to veterinary bacteriology, in particular his work demonstrating that *Brachyspira* (formerly *Treponema*) *hyodysenteriae* was the cause of swine dysentery

‘Bleeding calf syndrome’

THE first British case of idiopathic haemorrhagic diathesis, also known as bovine neonatal pancytopenia or bleeding calf syndrome, was diagnosed in April 2009. Since then over 110 cases have been confirmed in Britain on over 60 farms.

In a symposium on this recently emerging disease at the AVTRW congress, research teams shared their experiences and presented research into the disease’s epidemiology, potential aetiology and histopathology.

Andrew Holliman, from the Veterinary Laboratories Agency (VLA), gave an overview of the investigation that had taken place in Britain.

The syndrome had first been reported in Germany in February 2009. In the UK, he said, ‘A project team was assembled to take forward an investigation into this syndrome should it occur, which of course it very quickly did.’

The project team comprised the VLA, Scottish Agricultural College (SAC) and Moredun Research Institute. Veterinary officers were also alerted with standard procedures on what to look out for and what to do if they saw a case.

A practitioner survey was carried out asking if and when people had seen the condition before. ‘We wanted to be sure that we really were dealing with a new and

emerging disease,’ he said, adding, ‘It turns out that we almost certainly are.’

Awareness notes were issued giving information on clinical presentation of the syndrome. Protocols were developed for haematological, virological and histopathological postmortem examinations of suspected case submissions. The farms where suspected cases originated were visited and detailed information on husbandry practices was recorded.

Regular contact was maintained with colleagues investigating the syndrome



Andrew Holliman: ‘We wanted to be sure that we really were dealing with a new and emerging disease . . . It turns out that we almost certainly are’

in other European countries, including Germany, the Netherlands and Belgium, and preliminary data were presented at a workshop in Marseille in December 2009.

Studies in Germany had suggested the syndrome might be associated with circovirus, a particular bovine viral diarrhoea vaccine, or colostrum fed from dams.

‘Following the German work suggesting that it’s possibly a colostrum-derived factor, we decided in 2010 that we would now be following an immunological approach to the investigation,’ said Mr Holliman.

Aetiology

Akbar Dastjerdi from the VLA was part of a team that had investigated the potential for a virus to be the cause of the disease.

Samples from calves with suspected idiopathic haemorrhagic diathesis had been submitted for virological testing. Of 54 animals tested by virus isolation in cell culture and by ELISA and reverse-transcriptase RT-PCR, bovine viral diarrhoea virus type 1 was detected in two and the remaining animals were negative in all pestivirus detection techniques used. Electron microscopy of tissues from 12 animals was negative for virus particles, and various specific and broad-spectrum PCR techniques failed to identify other viruses. ▶

Also, in contrast to previous reports, there was no immunohistochemical evidence of porcine circovirus type 2 in 16 randomly selected cases (see *VR*, April 3, 2010, vol 166, p 436-437).

There was therefore no evidence for a viral aetiology related to the syndrome.

Sandra Scholes, from the VLA, explained that no histological examination had so far attributed a cause either.

Epidemiology

To look at the epidemiology of the syndrome, the VLA and SAC collected information on clinical signs, disease progression, herd characteristics and the husbandry of the calf and dam for 75 cases in Britain between April and November 2009. Another survey among private veterinarians assessed patterns of emergence of the syndrome.

Clinical manifestations varied from calves being found dead to unexpected excessive haemorrhage complicated by general malaise and pyrexia.

'There were, in the majority of cases, only one or two infected calves in each herd,' explained Sarah Lambton, an epidemiologist from the VLA.

Calves died at approximately 15 days of age after showing clinical signs for two to three days.

AVTRW executive committee

Professor Stuart Reid, Dean of the Faculty of Veterinary Medicine at the University of Glasgow, has taken on the role of AVTRW president for 2010/11, and Dr Dónal Sammin, of the Department of Agriculture, Fisheries and Food, Republic of Ireland, has taken on the role of junior vice-president (president-elect for 2011/12).

'Generally the spatial pattern of affected herds follows that of the high-density areas in the UK,' she said, but there was one notable exception in the south-west.

Average herd size was larger than the national average and more than 60 per cent of herds had sheep on the farm. More dairy herds than beef herds had reported cases. The majority of case calves received colostrum from their own dam and all dams had been vaccinated with at least one vaccine.

'We'll be carrying out a case control study during which we'll compare the husbandry factors on farms which are affected by the disease with husbandry factors on unaffected farms,' she said. This would concentrate on the factors already identified as being related to more than 60 per cent of the case calves.

Management

Graham David of the VLA noted that looking at the science and pathology of a disease was only the first step in managing it.

'What we need to look at is how we put these scientific findings in the context of wider society,' he said. 'To do that you need a coherent and transparent mechanism to investigate and communicate what this disease means in terms of a lot of different areas: not only the livestock industry but public health, what it means for international surveillance and international trade.'

'We've not only got to communicate with our scientific colleagues, we've got to communicate what that means outside of the scientific arena as well.'

He pointed out that all of the interested parties with a stake in a new disease should be informed of any developments and that any questions should be addressed by the bodies that assess and manage the risk.

To make informed decisions, high-quality data and consultancy were required from government agencies and other institutes, as well as a well-developed communications system and a method of assessing and prioritising the need for intervention.

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