The information explosion: technology for the veterinary practice

COMPUTERS have been used for educational and informational purposes for many years. This article outlines some of the different types of software which have been developed specifically for the veterinary market and which may be of interest to veterinary surgeons in general practice.

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THE recent development of affordable multimedia computers has allowed non-specialists to own powerful machines. This has created a market for numerous computer-based products, including games, educational material, and software for accounting, word-processing and many other home and business applications. This article will concentrate on packages aimed specifically at the veterinary market, rather than more general business applications. Examples have been chosen to illustrate the breadth of material available; some additional examples are included in the boxes.

What is a multimedia computer?
- A multimedia computer (hardware) is capable of utilising different media (text, sound, still images, moving images).
- The programs (software) for the computer are available in a variety of formats, such as CD-ROM (see box overleaf).
- A multimedia computer typically has a high resolution colour monitor, stereo speakers and a CD-ROM drive.
- Most modern computers aimed at the family and leisure market will be multimedia machines.
- If you need to know the technical specifications, a reasonable outline is as follows: Pentium 100 MHz, 16 Mb RAM, 8xCD-ROM, MPEG software or hardware, 64 K colour monitor (1 Mb VRAM), 16 bit sound and speakers. The suppliers listed at the end of this article should be able to provide more specific advice.

Facilities for communication

Some of the simplest facilities available are e-mail and discussion groups. Use of these depends on having appropriate e-mail software, a connection (modem) from your computer to the Internet, and subscribing to a service provider (a company which distributes any messages you send and provides access to the Internet). Another cost will be using the phone lines (although this is often charged only at local rates).

E-mail

E-mail allows people to communicate with each other for academic, business or personal reasons. It uses computers linked via the Internet, together with appropriate software for handling the mail. Simply type in your message (or use a document created in a word processing package), and the computer whisk it away electronically to the recipient. You can e-mail colleagues for advice, companies or laboratories for information or for ordering products, and your friends simply to keep in touch. The advantages of e-mail over paper mail (fax and letters) include speed (it is almost instantaneous) and the ability to have the contents of the mail, such as lab results or large amounts of written material, available directly to your word processor or other computer software (no more typing in of data or large amounts of text).

Discussion groups

A group of e-mail users can get together to form a discussion group on certain topics, be it exotics, marine species, wildlife, or more general veterinary topics. Each question and answer is automatically sent to every member of the group so, by sending a question to such a discussion group, many different users are given the opportunity to reply with advice or opinions. Specialist interest groups can also keep one another informed of meetings and other group events.

What is the Internet?
- The Internet ('Net') is a collective term for the worldwide computer communications network.
- Any computer can be linked to any other computer, either permanently or temporarily, via electrical connections. Linking of computers in this manner allows exchange of information between computers.
- Computers can be connected to the Internet via a telephone line (using a modem), via a cable communication (such as a cable TV network), or via the ISDN (Integrated Services Digital Network) high speed network.
**What is the World Wide Web?**

- The World Wide Web, often known simply as ‘the Web’, is a more user-friendly way by which to use the internet.
- Software ‘browsers’ such as Netscape or Internet Explorer allow the user to find ‘pages’ of information supplied by other computers. These pages are known as ‘Web sites’.
- Web sites may contain text, pictures, moving images and sound.
- Sophisticated indexes (called ‘search engines’) such as Yahoo, Excite, and Magellan allow the user to hunt for any topic, and look at the relevant Web pages on their computer.
- For example, if you are interested in veterinary pathology, there are many pages which you can link up to for continuing education, case challenges, dates of meetings, proceedings of meetings, and so on. Some scientific journals also publish their contents and abstracts for access over the Web.

**What is a CD-ROM?**

- A Compact Disc Read Only Memory (CD-ROM) is a means of storing large amounts of information; the computer can read data from these discs, but not write back to them.
- A CD-ROM can store about 400 times as much information as a typical floppy disc.
- CD-ROMs have become one of the most convenient means of storing the huge amount of data (images and sound take up lots of space) needed for multimedia programs and other complex software.
- To use a CD-ROM, your computer needs a CD-ROM drive; the faster the drive, the more smoothly programs can be run.
- It is important not to confuse CD-ROM material with CD-I material.

**PRODUCTS AIMED AT THE VETERINARY MARKET**

**Animal Information Management**

It is nearly a decade since Animal Information Management, an Australian group, began work on their first diagnostic program, Bovid. The project aims to develop systems which assist in diagnosis and treatment of animal disease, record keeping and disease surveillance, and help us cope with the information explosion. This group has produced ‘expert system’ type programs (which simulate the decision making skills of an expert in that area), which also include Canid and Phytox. The very helpful and professionally produced Web site provides a free demonstration version of Canid.

Canid provides information on clinical presentation, therapy and management of diseases of dogs, excluding diseases of the skin and eye. The program provides recommended treatments, case work-ups, and an on-screen tutorial. The simple screen interface is menu and windows driven, but the main strength of this program is its information content. Score estimates are given for how often each sign is seen in a particular disease, and the differential diagnosis lists are ranked according to probability, avoiding the frustration of sifting aimlessly through unranked possibilities. Each disease includes risk factor details, and references to the major texts. Bovid, the bovine counterpart of Canid, covers signs, postmortem findings, confirmatory tests and management of cattle diseases, again with all the probability and ranking information which makes the programs so valuable.

Phytox allows the user to obtain current information about toxic plants, fungi and cyanobacteria throughout the world. As with Bovid and Canid, the Phytox program lets the user undertake case investigations, check possible differentials,
Clinical signs, and necropsy findings.

All three programs have a built-in note pad which allows the individual user or practice to make their own additions or comments. One word of caution is that the probabilities of disease occurrence can be influenced by regional or other factors, but these can be adjusted easily by the user.

**Computer-aided Learning in Veterinary Education (CLIVE)**

CLIVE is a consortium of the Universities of Liverpool (lead site), Bristol, Cambridge, Glasgow, Liverpool and London (Royal Veterinary College). The project aims to make computer-aided learning an established and expanding feature of veterinary education in all the sub-disciplines of veterinary science in all UK veterinary schools. It reached the end of its initial three-year funding by the UK Higher Education Funding Councils' Teaching and Learning Technology Programme last year, but continuation has been assured by the commitment of staff resources from the veterinary schools.

With support from a commercial publisher for sales to overseas schools, and also to practitioners undertaking continuing professional development, CLIVE is now moving into its 'business phase'. The CLIVE project has support from the Royal College of Veterinary Surgeons, and contracts with other professional associations.

Current products include numerous self-test assessments including equine and bovine limb anatomy, renal pathology, lambing, farm animal diseases, orthopaedics, diagnostic imaging, veterinary public health, medicines legislation, to name just some of the areas. There are case studies and simulations covering many topics, including weight loss, skin lesions, polydipsia, equine respiratory disease, and anaesthesia. A large number of products have been completed, and many more are in the pipeline.

The strengths of CLIVE include its large base of authoring expertise, drawing on lecturers from all the UK veterinary schools. Additionally there are experts in computing and instructional design involved with the project, ensuring that the final products are of high quality in both educational and production terms.

The distribution of CLIVE products will be handled by a commercial publisher, possibly being CD-ROM-based, and when discussions are finalised (in the near future) the details will be announced through the CLIVE Web site. The CLIVE project has an excellent and professional-looking Web site, from which much more detailed information is available.

**International Veterinary Information Centre (IVIC)**

Anyone who has used the Internet and World Wide Web will be aware of some of the major limitations of these networks. First, and perhaps of greatest importance, is that although there is a wealth of information available it can be very difficult to find what is needed, or even what exists. The sheer size of the network can cause real problems in tracking down relevant data, leading to hours of wasted time aimlessly 'surfing' through the Internet index systems. Another problem with large open networks is that they present a security risk, and many computer systems remain vulnerable to deliberate interference or unauthorised access by other computer users. Anyone who has ever attempted to retrieve large amounts of data, such as high resolution images, from the Internet will be aware that such files can take a very long time to be transferred between computers.

IVIC is a dedicated veterinary computer network which consists of a central hub of computers, to which veterinary practices, veterinary-related companies, universities and other relevant users can be linked. In this way it has similarities to the Internet, but with several advantages for veterinary users. The content is strictly veterinary-related, making data and services easier to locate, security is much better since IVIC is a closed veterinary network, and the service is fast due to utilisation of the digital telephone network.

IVIC provides a wide variety of services, including communications via e-mail, events calendars, news, electronic publications, literature searching, drug data, continuing education, and various forums. Laboratory results can be delivered by e-mail from participating laboratories, and services or products are
available from an on-line catalogue.

IVIC is a flexible system which can be adapted to suit the needs of a particular practice, and can be incorporated with existing practice management software. The IVIC service can be accessed by fast modem, but is best run over ISDN which requires installation of an ISDN telephone line, together with the IVIC software and bridging connections.

**Lifelearn**
Lifelearn is a company offering a variety of different types of material for veterinary professional development and client information, in different formats. Material is available on CD-ROM, CD-I and floppy disc. Topics covered include small animal cardiology, dentistry, dermatology, feline medicine and surgery, and dairy herd management. Modules are case-based, and the user can proceed through detailed work-ups with access to video tutorials, and help from a large database of textual information, diagrams, and photographs. Each module is designed to represent the equivalent of a two day course.

In addition, there is Case DISCovery, a series of simulations, representing everyday cases which can be worked through to develop both diagnostic and treatment skills. Each simulation is designed to take 30 to 40 minutes to complete, and a new small animal case is released every two months.

A different type of product is available in the form of the Companion to Canine Practice, and the Companion to Feline Practice. These CD-ROMs contain large amounts of information covering clinical signs, diagnostic tests, treatments and outcomes. The information is cross-referenced and can easily be located. Differential diagnoses can be generated, and information can be printed out.

A further type of product offered by Lifelearn is 'Client Information Handouts' supplied both on paper and on floppy disc. The collections cover dogs, cats, exotic pets, and cage birds and parrots. The information can be simply photocopied on to your practice letterhead, or altered and revised using a word processor before incorporation into practice literature. Lifelearn material is professionally presented and competitively priced.
**Vetstream**

Vetstream is a Cambridge-based company which has been under development since the late 1980s. The Vetstream project was initiated in response to the information overload facing veterinary surgeons. The project is an ambitious one, since it aims to provide all the information that a vet in practice might need, in an up to date form, for immediate access at any time.

The information is supplied as species-based CD-ROMs which are updated every two months. The canine CD was launched in March 1997. Its content is encyclopaedic, and is written to certificate level and peer-reviewed by a team of 60 clinicians. The information is comprehensively cross-referenced and includes text enhanced by sound (such as heart sounds), video (surgical procedures, ultrasound sequences) and pictures (radiographs, gross lesions). A database of appropriate drugs based on the cascade system can be used to find appropriate licenced products, along with data sheets and additional information from the BSAVA formulary and the manufacturers.

Information can also be searched for by presenting sign, allowing construction of a differential diagnosis list, with information on diagnostic tests and treatment options. The information obtained from a search can be saved and printed out, and each user can customise the system to suit their own needs.

The information can, of course, be used for continuing educational purposes, but its main aim is to provide ready access to critical information at the time it is needed. It is easy to envisage how this type of system could fit into the consulting room, providing on-the-spot support for both junior and senior practitioners. Aside from the annual subscription there are no further costs. The software is well-designed and easy to use, with thoroughly professional presentation.

**Vet Web**

Vet Web began in 1995 as a project submitted to the RCVS to promote the cause of continuing professional development. It is a World Wide Web-based service and has over 500 registered veterinary users. Vet Web is a free information service directed at those in general practice. To use Vet Web, you need 'browser' software and a computer which can be connected to the Internet (usually by way of a modem). The project provides a home Web page which is indexed to other pages of veterinary interest, avoiding the need to search the huge amount of information on the Internet in order to find items of professional interest.
To access these pages, those with e-mail need only additional software (a browser) which is usually provided free, or at low cost, from the Internet service provider. For those without e-mail, the costs include a modem, fixed subscription to a service provider, and the telephone bills arising from use of the telephone line (most calls are charged at local rates). Once connected to the Internet, you can retrieve information from millions of other connected computers, on almost any topic, if you know or can find where to go! Vet Web provides shortcuts (fixed links) to popular sources of veterinary information.

Vet Web is independent, and provides a database of relevant information related to continuing professional development topics, with links to universities, veterinary societies and other areas of interest to veterinary practitioners. There is the opportunity to book events directly, using pages which automatically mail the booking information to the event organiser. Society pages can be made available, either openly or restricted by password to that society’s members. Vet Web has facilities for open e-mail discussions, pages for individual vets (including areas of personal expertise, referral services, and so on) and pages of information for veterinary practices (practice profiles). It also has facilities for conducting questionnaires which may be used for research.

**Costs**

- Multimedia computer prices tumble weekly, and vary markedly according to specification, but expect to pay from around £1000
- Lifelearn products vary from £25 for small animal case simulations, to £195 for modular tutorials (CD-I or CD-ROM and text)
- IVIC connection (IVIC software, installation, ISDN line installation and internal bridge) costs from £1330. Subscription is £60 a month for unlimited numbers of users on one site. There is a new low-start subscription fee of £27.50 per month (for a practice site with unlimited users, and up to 10 hours use per month). All telephone calls are charged at local call rates
- Vetstream subscription costs £95 a month for a practice, with CD-ROM updates every two months
- Focus On: Veterinary Science and Medicine. 12 issues on diskette for US$240
- Animal Information Management: CANID Aus$650 (student $120), BOVID-3 Aus$490 (Student $100), PHYTOX Aus$300 (student $60)

**DON'T GET LEFT BEHIND**

There are many quality products designed specifically for veterinary users. Since they have different aims and purposes, direct comparisons between products are not always possible, and it may well be that a practice or individual would decide to take up several products.

No doubt more ideas will appear aimed specifically at the veterinary market, and so it is tempting to wait and see what comes along. The problem with waiting for future developments is that this is a field which is continually improving, and so there is never a final point at which one can make a definitive evaluation of what is available.

What is certain is that if you wait long enough, you will eventually be left behind. So go ahead and make those tentative first steps, and you will probably be pleasantly surprised!

**Contact details**

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**Digital Lectures**
CD-ROM titles (see Veterinary Record 138 (9), pp 199-203) from BSAVA congress and BEVA Equine Stud Medicine & AI Course.
Dr Mark Holmes, Department of Clinical Veterinary Medicine, University of Cambridge, Madingley Road, Cambridge CB3 0ES.
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**Focus On: Veterinary Science and Medicine**
Literature database of 162 journals. Floppy disc-based, with free sample available.
ISI Europe, Brunel Science Park, Uxbridge UB8 3PQ.
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**IVIC**
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**Lifelearn**
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