The internet. Part one: what it is and how critical care nurses can use it

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SUMMARY

❖ This is the first of two articles about the internet, high-lighting its significance for critical care nurses world-wide.

❖ A brief overview of the structure of the internet is given, and its language is introduced

❖ Tools used commonly to access information are described

❖ Some of the most useful starting points for critical care nurses are noted

❖ Useful hyperlinks are provided throughout the text, which can be accessed directly when reading on-line.

INTRODUCTION

During recent decades, the internet has become a major information provider in the modern society. Post-modern human beings surf the internet not purely for entertainment, but also for educational purposes and general collection of information and various types of data collection. This literally world-wide network, with enormous numbers of users, has incredible significance. It was not initially intended to develop into its current, dominant position, but was a way of sharing files and bringing together those with similar interests across geographical barriers. The anarchistic element is still evident, and the internet content still largely cannot be controlled or regulated by governmental or official bodies.

Originally, the internet was developed for military purposes, to establish secure lines of information distribution in an uncontrolled nuclear war. Eventually, functionality and user-friendliness has contributed to its popularity.

Also, within the professional critical care nursing community, the internet holds a strong position as 'the information super highway'. However, the amount of information is so overwhelming that basic knowledge about how it works is needed for efficient use, and search strategies need to be adapted from those used for searching bibliographic databases of edited and peer reviewed articles supporting evidence-based nursing (French 2002).

Basic internet functionality

The basic internet functionality is created by computers linked and interconnected via networks, computers and servers. Servers are computers configured as 'file hosts' in networks. The use of standardised protocols for information transfer, display and file formats allow an efficient platform for information exchange. The communication is enabled by the standardised use of the hypertext transfer protocol **(HTTP).** HTTP allows simple, rapid and efficient transfer and exchange of **text files, hypertext** (files linked together, creating underlying information links that the user can choose to select), **graphical files, sound files, animation files,** and **video files.** This multimedia functionality and flexibility creates the new and increasingly powerful multimedia-based communication tool, and enables interaction between human users, wherever they may be geographically located in the network.

The software for uploading or downloading files between computers is based on file transfer protocols **(FTP).** FTP software is easy to use for those familiar with organising files on a computer. The underlying programming language for pages that are displayed in the browser software is hypertext mark-up language **(HTML).** All elements of information displayed in a browser are coded in HTML tags. Software used to develop HTML makes it unnecessary to handle HTML tags, as the underlying coding in common HTML editors is hidden for the user. This feature is called 'WYSIWYG – what you see is what you get' functionality. The use of a graphical user interface in most software eases the use of critical software.

The name of an individual website is defined by the Unique Resource Locator **(URL).** The URL is a unique description, and one element of it is the domain name. There are an increasing number of domains like **.com, .org, .net, .edu, .gov and .biz.** Domain administration is handled, in some cases strictly, by various types of organisation, spanning from governmental or academic to commercial areas. Formal owners of domains are under legal protection. In addition, national domains like **.uk, .de, .no, .se,** etc. are administered in accordance with national legislation.

Network technology with increasing bandwidth is resulting in reduced time for transfer of information. The cost of the technology in general is slowly lowering due to an increasing volume of users.

The browser

The browser is the software dedicated to display **.html** files. Browsers can read a variety of multimedia file formats including compressed graphical **.jpeg** or **.gif** files. Compression of image files is required to reduce the download time, without compromising the image quality or information. The browser software handles the basic multimedia functionality of the internet. However, new file formats are developed over time, and new versions of browser software appear and must be updated and downloaded to handle the development. Many video and sound files require specific plug-ins to play them, other than the default Microsoft Windows Media Player <http://www.microsoft.com/ie> in the Microsoft Internet Explorer browser. Examples are QuickTime <http://www.apple.com/quicktime/download>, RealVideo and RealAudio <http://www.real.com>, and they are usually available as free downloads or low-cost shareware programme packages on the internet. A variety of other 'browsers' are available in addition to Microsoft's Internet Explorer e.g. Netscape <http://www.netscape.com> and Opera <http://www.opera.com>. They have slightly different operations and buttons but they all achieve the function of displaying the **HTML** pages.

Navigation

There are several strategies for navigation on the internet. Navigation commands can be made by clicking on drop-down menus or by clicking navigation buttons illustrated in Figure 1. In fact, most basic internet use can be done without writing at all.
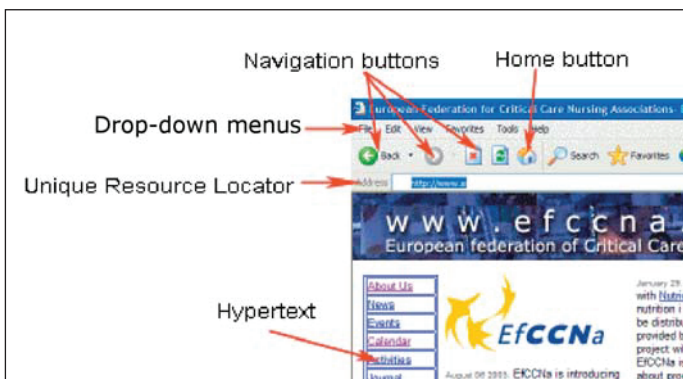

Figure 1: Basic navigational options in an internet browser

The URL identifying a website is always displayed in the 'Address' field in the browser. To open a specific site, the URL can be entered in the address line directly with the prefix **'www.'** combined with the domain name **'efccna.org'.** It is not necessary to write **'http://'**, as the browser adds this prefix automatically. The next time the same URL is entered, the browser identifies the letters being used and automatically suggests the domain name, making site opening even faster. In many cases, the direct entry of a URL is the fastest way to open a website, when the names are obvious like 'efccna.org' or 'nokia.com'. The 'Address' line also has a drop-down button and, when clicked, it lists all URLs recently entered in the 'Address' line. As with most other software, there are several ways to obtain the same result. The user must gain experience and try to sort out different ways of using the software, and develop personal preferences after learning by doing.

The standard navigation buttons are placed at the top of the browser screen. 'Arrows' make it possible to go back and forth between pages visited, and the 'House' button always brings the browser-defined default start page back (although this can be changed by experienced users). It is very important to know how to store important websites as bookmarks when valuable information is found and the user wants to return to it at a later stage. Bookmarks, made by storing URLs, can easily be made by using one of the alternatives available under <Favourites>, <Add to Favourites> or <Organise Favourites> in Internet Explorer, and similar tools in other browsers. A little time spent on systematically organising bookmarks and placing them in folders is necessary, but is worth it in the long run.

So far, basic use and functionality and use of the internet have been described. More systematic use of the internet, particularly for professional or educational reasons, requires more advanced user experience and knowledge.

Search engines and directories

The web has tools to help locate pages that are relevant to your particular topic. Each works slightly differently and you need to try them out to find the ones that suit you. With some of the resources, you can 'browse' categories of information, e.g. health or medicine, which may contain a sub-section on nursing, or you can 'search' by typing one or more terms into a box.

Search engines, such as Alltheweb <http://www.alltheweb.com>, Google <http://www.google.com> and AltaVista <http://www.altavista.com>, all index literally billions of web pages by using automated pieces of software to visit web sites and follow their links. The search engines then index the full text (or at least a significant part of the text) of all these pages and allow users to search for them by typing in keywords or subject terms. The search engines may index hundreds of millions of web pages, but no single search engine indexes every web site on the internet.

Key points about search engines

❖ To use a search engine, you must know what you are looking for, as you have to create your own search terms.

❖ Search engines gather web sites automatically; there is no human intervention and no quality control.

❖ When you are using a search engine, you are not searching every site on the internet! You are only searching the pages indexed and found by the search engine you are using.

❖ Always look at the help pages provided by each search engine, as they all work in slightly different ways and knowing how best to organise your search terms can save time and greatly improve your search results.

❖ When you are using search engines, you should use one or two regularly in order to become familiar with each one's specific searching techniques. It is far better to use one search engine well than to use five badly!

Directories are sometimes confused with search engines but operate slightly differently. Some directories are partly automated and resources are found by a piece of software and are then arranged into categories by a human editor. However, other directories use human editors for selection and organisation. Read the 'About' section to find out how the directory you are using is

created. In both cases, resources are organised hierarchically and allow you to browse through a range of health subject areas that are arranged from the broad to the specific. In addition to browsing, web directories also support searching and you can use search terms and key words to search the directory's internet resources, e.g. Yahoo <*http://www.yahoo.com*>.

Subject gateways

Gateways facilitate internet browsing and searching and are specifically designed to help you find high quality internet sites and resources. Subject gateways are characterised by the fact that they are built by highly qualified people – often academics, librarians or professionals. This enables them to offer unrivalled quality control, with each internet site being hand picked, described and classified by specialists.

Gateways are often geared to support academic learning and research communities. Some gateways specialise in particular subjects while others cover a range of subjects. Well known examples are the UK subject gateways built for the academic community, now pulled together under a service called **The Resource Discovery Network (RDN)** < *http://www.rdn.ac.uk*>.

Key points about subject gateways

❖ Subject gateways provide access to evaluated web sites that can support learning and research, but the site coverage is relatively small.

❖ When you search a subject gateway, you may want to use broader search terms than you would use in a search engine. This is because the collections are smaller due to the amount of human effort required. Also, remember that you are searching catalogue records that describe internet resources and are not searching the actual resources themselves.

❖ When you browse a subject gateway, remember that although you are browsing a relatively small collection of resources, it is a high quality collection.

❖ Resource descriptions are provided for each web site and have usually been written by information professionals or subject specialists. Read them and you will get a good idea of whether the site in question is suitable for your needs or not.

Portals

Portals are emerging on the web which enable you to customise your pages, perhaps to your own country or interests, and may provide cross-searching facilities across several databases. Many universities are currently developing institutional portals for their own staff and students, and subject-based portals are under development.

Further help with learning to use the internet is available in books and magazines and on the web itself. Many of these are very general but several have been developed for nurses and allied health professionals. Some of the best interactive tutorials on the net are made by the Research Discovery Network as virtual training suites (VTS):

❖ VTS Internet for Nursing, Midwifery and Health Visiting <*http://www.vts.rdn.ac.uk/tutorial/nurse*> (This tutorial is strongly recommended!)

❖ VTS Internet for Allied Health <*http://www.vts.rdn.ac.uk/tutorial/allied*>

❖ The Internet and IT for busy Nurses and Therapists <*http://www.carol-cooper.co.uk/book*>.

Examples of web sites for critical care nurses

Due to the constantly changing nature of the internet, the descriptions and URLs given below are liable to change after this article has been printed. For a constantly updated gateway of relevant resources, see NMAP, the UK's gateway to high quality internet resources for nurses, midwives and allied professions <*http://nmap.ac.uk*>. Other examples of web sites for critical care nurses are:

❖ European federation of Critical Care Nursing associations (EfCCNa) <*http://www.efccna.org*>

❖ World Federation of Critical Care Nurses (WFCCN) <*http://www.wfccn.org*>

❖ British Association of Critical Care Nurses (BACCN) <*http://www.baccn.org.uk*>

❖ American Association of Critical Care Nurses (AACN) <*http://www.aacn.org*>.

The next article will have a more specific focus on how to use the internet in a professional critical care nursing setting.

Communication

As well as providing a rapid way of accessing information, the internet is a good way of enabling two-way interaction. Whereas the web generally presents pages of information, with occasional forms to fill in, you can use e-mail, electronic mailing lists, Usenet newsgroups, and chat, to communicate with one or more individual around the world. Technical and cultural issues need to be understood to get the best use from these systems.

E-mail

Electronic mail is a quick and easy way of communicating. It is faster and cheaper than a letter and has some of the features of a phone call. The message is quick, often arriving in the recipient's mailbox in seconds. The recipient doesn't need to be at their computer, or able to answer the telephone, as it will be stored until they wish to read it. You can save the message and/or edit it into your own document, and you can, of course, reply.

The message you receive (or send) can also be forwarded to others, enabling collaborative working, without the travel that might be involved in a face-to-face meeting, particularly if long distances are involved, and it is cheaper than a long distance or international phone call. This ability to forward messages easily, potentially to thousands of people, should be borne in mind when writing e-mail messages. Using electronic communication can cut down on the amount of trees demolished to make paper, especially if the message is being sent to multiple recipients.

Viruses

It is possible to transfer computer viruses in e-mail messages and attachments. Therefore, it is important to have an up-to-date virus checker installed on your machine and not to open attachments to messages from people you don't know.

Viruses are programmes that copy themselves from one machine to another, usually without the user's knowledge. Some appear harmless, simply displaying a message, but others can be very damaging, destroying files and software. Even apparently harmless

viruses will reside in the computer's memory and interfere with the working of other software.

E-mail addresses

E-mail addresses look complicated when you first see them, but with a little practice they become easy to use. E-mail addresses need two parts: the name of the mailbox (in most cases the name of the user) and the machine that deals with their mail. They are separated by an '@' symbol. The name of the machine will depend on the user's access provider: often their employer, college or commercial internet service. The last part of the address can tell you about the machine they use, and follows the conventions set out in the section on the world wide web. The machine used by one of the authors (RW) is at the University of the West of England, hence uwe.ac.uk. Therefore his e-mail address is Rod.Ward@uwe.ac.uk.

Headers

All e-mail messages are transmitted with a header, which tells the computers used in their path across the internet what to do with them, and provides information for the recipient(s).
The 'To' box must be completed with the e-mail address of the person you are sending the message to. Most mail programmes also allow you to send a copy to another recipient by putting their e-mail address into the 'CC' box.

Subject line

The subject line is very important. When someone gets their mail, they will initially see a list of who the messages are from and the subject line. Make these pertinent and interesting. If someone receives a lot of e-mail, they might not read your message unless the subject interests them.

Message style

E-mail is generally much less formal than a printed letter. However, remember that the person reading it cannot see any non-verbal cues, or hear the tone of your voice. A sort of shorthand has emerged to reduce typing frequently used phrases.
Abbreviations used in e-mails:
BTW   By the way
IMHO   In my humble (or honest) opinion
FAQ   Frequently asked question
RTFM   Read the flaming manual
TIA   Thanks in advance
TTFN   Ta-ta for now
   It is worth noting that typing everything IN CAPITAL LETTERS is considered shouting. In an attempt to enable more expression in text, a convention has developed of using emotions or 'smileys', to give the reader clues to the way in which a sentence is meant. To make sense of the examples shown below, turn your head on the side to look at them.

Smileys

:-)   The original smiley – means sent in humour, joking or
          happy
:-(Sad smiley
;-)   Winking
:-0   Surprised
It is always worth taking a few seconds to re-read your message (and use a spell checker) before pressing the send command. Once

it has gone you can't cancel it and the text is all the recipient has to make an impression of you. It is worth thinking before responding in anger to an e-mail. It can be so easy to reply immediately in an instant reaction, which might change on reflection. If your internet access is provided through a university or employer, they will be able to read what you have written and see which web site you are visiting! This information may also be available to governments and other agencies.

Signature files

Many people have a signature file (often shortened to .sig or just sig), which is automatically appended to their e-mail messages. This is a useful way to tell people who you are, your e-mail address, URL of your web page and so on. It is generally considered to be poor 'netiquette' to have a sig file more than four lines long.

Attachments

Just about any computer file (text, graphics, sound, etc.) can be attached to an e-mail message and this is the best method for sending large files. However, some care is needed as different software uses different 'formats or encoding' for mail attachments, and the recipient of your message might have difficulty decoding it. Some formats, e.g. Portable Document Format (**.pdf**) files, require specialised software to be able to read them. In the case of .pdf, which is commonly used by the UK government sites, Adobe Acrobat Reader <*http://www.adobe.com*> is required. Other problems can arise if the attachment was created by one version of a software programme and the recipient has an older version. For word processor files, this can be overcome by sending them as Rich Text Format (**.rtf**).

   Some attachments can be large files and some recipients may have to pay per minute for call charges to download them. Sometimes this can be reduced by the use of 'zip' files, but the the recipient needs the appropriate software to 'unzip' them.

E-mail lists

You can create mailing lists in most e-mail packages in the address book; the exact details will vary depending on the e-mail package you are using. This is fine for small groups of people you frequently want to send the same message to. However, a wide variety of mailing lists have been set up to enable people with shared interests to communicate.

   E-mail lists can provide an opportunity for networking with others with similar interests or areas of practice and reduce professional isolation. They can be used to ask questions and discuss new ideas or research.

   These lists are automated to enable subscribing (free) and unsubscribing. Once subscribed, any message sent to the list will be distributed to everyone else who is a member of the list. The programme that achieves this is called a listserv (or listproc or majordomo), with which you interact using specific commands.

   Any list you subscribe to should send you a welcome message, describing the purpose and areas of discussion. Whatever the subject area, these lists enable open and rapid discussion across geographical (and professional) boundaries. It is worth reading a few messages on the list before posting yourself to make sure that your comments are 'on-topic' for the list and that you think the other subscribers will be interested and helpful in response to your comment. You should not take any comments on an e-mail list too

personally, they are often written very rapidly and may come from people of different cultures; don't be put off if you receive negative responses.

Newsgroups
Usenet newsgroups have been around for a long time on the internet. They are open access discussions that anyone can read and anyone can post to. There are now over 45,000 newsgroups covering every topic you could think of (and a few that you couldn't!). Newsgroups are similar to mailing lists, but there is no central machine or subscription mechanism. The posts are sent from each service provider to a few nearby machines along with any new messages received from them every few minutes or hours. It can take a few days for this mechanism to distribute the message around the world. It is up to the news administrator at your ISP to decide which groups that service provides.

Naming – the Usenet hierarchy
There are several headings or hierarchies under which newsgroups are located.
Examples of newsgroup headings:
sci   scientific
alt   alternative
misc   miscellaneous
rec   recreational
uk   United Kingdom
   Within each of the major headings are subcategories, for example, within sci there is a subgroup called med (medicine), within which there is a subgroup of nursing. Therefore, the title of the main nursing group is sci.med.nursing. There is also a UK-specific nursing newsgroup: uk.sci.med.nursing.

A note of caution
As newsgroups are open to anyone, there are some where 'bad' language or a lack of courtesy can be detected. This tends to be particularly in the alt. groups, which are also the source of much of the bad press about the internet.
   Other dangers include 'spamming' (sending a message to multiple lists) and advertising, although this is discouraged on some groups. If someone sends a derogatory comment on a group, it is known as a 'flame'. If others respond in the same vein, a 'flame war' might develop.

Chat
Chat enables 'real time' communication between users over the internet, enabling almost instant discussion. Two or more participants in a virtual chat room can type in messages that can be seen and responded to by the other users.
   The ability to communicate requires someone to be at the other end at the same time, so you can either arrange a time when you know someone else will be online, or take pot luck. Most users of chat are American, therefore, in the UK, the late evening is the best time to access chat. Very often in chat rooms people may not be who they claim to be, with men pretending to be women, women pretending to be men and occasionally people pretending to be small furry animals! Therefore, caution is required about the type of information that you give out about yourself.

CONCLUSION
Many critical care nurses are already using the internet for literature searches relating to their practice, and are communicating with others interested in similar areas across the world. This is likely to increase and become as commonplace as using the telephone. Many useful research reports, clinical guidelines and other useful resources are now only being published electronically. There are also new journals, like Connect, which are only published on the web. Many of the traditional paper journals are moving some or all of their content towards this medium along with their paper-based journals.
   It is important that critical care nurses can access this vast resource and find the materials that are relevant to them and use the information in the best possible way (Maggs-Rapport 2001). Once they have found suitable materials, it is vital that they make sure that the information is properly evaluated and, if appropriate, incorporated into practice.
   Many patients and relatives are also using internet resources to help them manage their own health concerns with up-to-date information and specialised knowledge. Changes like this will necessitate new ways of learning and working for critical care nurses. The possibility to update knowledge within education, research and clinical practice remains a great challenge. Those unable or unwilling to take advantage of the opportunities available are at risk of potentially providing lower quality of care to their patients.

The next article will:
❖   bring more general information about internet functionality
❖   focus on ethical guidelines and how the user can assess quality of content on web sites
❖   describe some useful web sources for research literature that can provide professional and updated information
❖   present some important standardisation organisations
❖   discuss international organisations working within the field of nursing informatics and healthcare informatics.

GLOSSARY OF TERMS
Attachments: any file attached to an e-mail.
Browser: software used to display pages on the internet.
Chat: software enabling real-time communication between users.
Directory: software partly automated and partly edited by humans, which lists hierarchies of information on the internet.
Domain: part of the URL (see below) showing the origin of the website.
E-mail: software for electronic mail.
E-mail lists: lists created by a user, or automated lists, which users with shared interests can subscribe or unsubscribe to.
File transfer protocol (FTP): software for the transmission of files between computers in a network.
GIF (Graphical Interchange Format): compressed image format based on proprietary compression algorithm. Compressed images take less time to send over networks.
Hypertext: 'clickable' text files or pictures linked with other underlying files.
Hypertext mark-up language (HTML): programming language for pages presented in a browser.
Hypertext transfer protocol (HTTP): standardised protocol for exchange of files on the internet.

JPEG (Joint Photographic Experts Group): standardised image compression mechanism – the original name of the committee that created the standard.

Netiquette: ethical standard for proper communication on the internet.

Newsgroups: similar to e-mail lists, but without subscription mechanisms.

Portals: websites enabling customisation by the user, depending on the user's interests.

Search engine: automated software to locate information on the internet.

Subject gateways: specialised websites edited by experts, often related to academic learning or research communities.

Unique resource locator (URL): unique name identifying a web address.

Viruses: programmes that copy themselves, normally without the user's knowledge. They vary from harmless to very damaging to files or software.

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