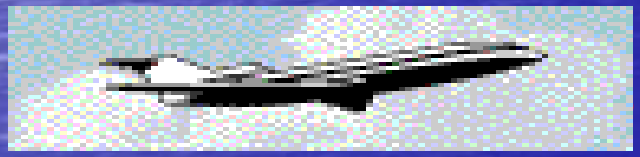
NEAR EAST UNIVERSITY
35 Years in Education

Faculty of Pharmacy

Pharmaceutical and Medicinal Information Management -1



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There is no a power greater than knowledge for future creation…

The Aim of This Course:

To describe and provide guidance on the knowledge and skills involved in finding, interpreting and communicating information about medicines.

The Title of This Course:

‘Drug Information’

‘Medical Information’

‘Research/Scientific Information’

Pharmaceutical and Medicinal Information Management

Course Content

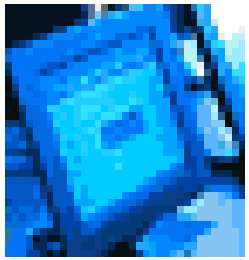
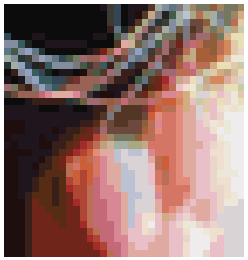
- Introduction
- Information Resources:
  - Categorization of Information Resources
  - Evaluating and Choosing Resources
- Information Technology
- Information and Knowledge Management
- Providing Information
- Analysing and Evaluating Information
- Developing Professional and Managerial Skills

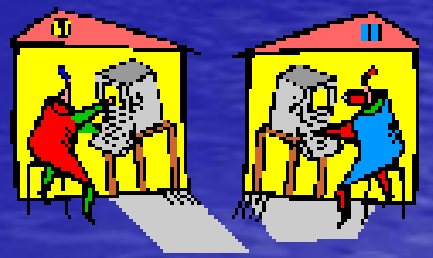
Introduction

- 'Information Age',
- Information needs,
- Information Technology,

Introduction

- Results of extensive research programmes,
- Huge volumes of medicinal information,
- Modern medicines,

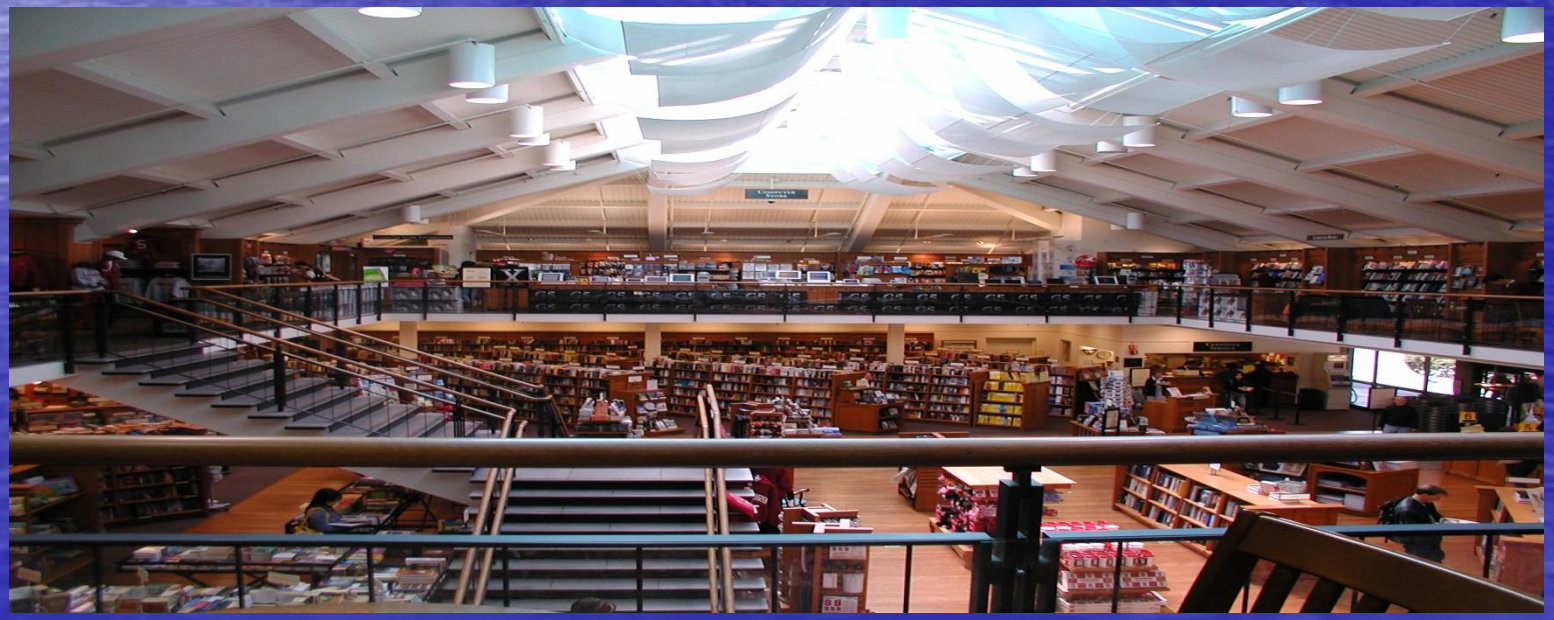



Introduction

- Reliable,
- Usable,
- Up-to-date,
- Accurate
- … information and knowledge about medicines

Introduction

- Pharmacists,
- Information centres/departments,
- … play a key role for information and knowledge about medicines



Introduction

- Research & Development,
- Registration of medicines,
- Marketing & Sales Activities,
- Pharmaceutical industry - ‘Information intensive’ industry / Knowledge-based industry

Introduction

- Skills (in finding information, in analysing and evaluating it and in communicating it etc.),
- Tools (IT etc.) and
- Knowledge,

Introduction

- Importance of Library and Information Services

Introduction

- Hospital-based drug information centres
- Information departments in the pharmaceutical Industry

Introduction

- Entrants to pharmaceutical information work

Introduction

- Specialist academic courses

Introduction

- Specialist academic courses (in the UK) in association with:
  - PIPA (The Pharmaceutical Information and Pharmacovigilance Association) the association was formed in 1974 and was previously known as AIOPI (the Association of Information Officers in the Pharmaceutical Industry)
  - UK DIPG (Drug Information Pharmacists Group)

Introduction

For the pharmacists and the information professions in the pharmaceutical environment:

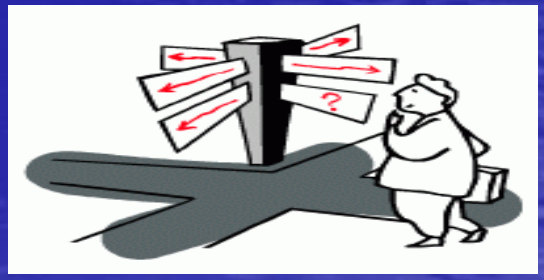
To develop their careers and to demonstrate the value that their services provide,

Improving the image and standing.

Information Sources:

The Information sources available to support the discoversy, development and effective use of medicines are numerous, varied and rapidly changing.

- To make no attempt at an exhaustive listing of useful resource.
- A general overview of the kinds of resources available, with some examples.

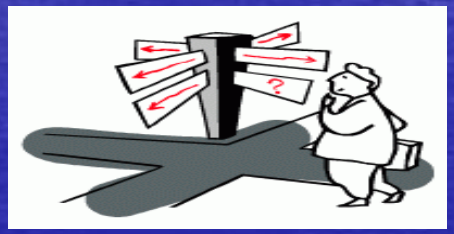


Information Sources:

Categorization of Information Resources

There are four general ways in which information resources may be categorized:

- by subject,
- by format,
- by location,
- by type of material.



Information Sources:

Categorization of Information Resources:

Subject Categorization

- A breakdown by subject is not the most useful way of dealing with the topic

- It is worth noting at this point the breadth of subjects which are relevant to pharmaceutical information in the broadest sense.
  - It is possible to define a core set of subjects
  - It well-night impossible to set clear boundaries around the subjects.

Information Sources:
Categorization of Information Resources:

Subject Categorization

- An illustration of the breadth of scope, and the diversity, of information sources :
  - Commercial Databases
  - Patent Documents and Associated Literature
  - Trade and Industry Periodicals
  - Trade and Association Reports
  - Newswires
  - National Newspaper Articles
  - Press Releases with Company News
  - Press Releases Concerning Scientific or Medical Developments
  - Articles and Interviews in ‘General’ Magazines

Information Sources:
Categorization of Information Resources:

Subject Categorization

- An illustration of the breadth of scope, and the diversity, of information sources : (Continuation)
  - Articles in 'Local' Newspapers and Magazines
  - Scientific and Medical Primary Literature
  - Meetings Abstracts
  - Meetings and Seminar 'Hand-Outs'
  - Calls for Proposals for Research Grants
  - Announcements of Grants and Similar Funding
  - Company Quarterly and Annual Reports
  - Other Company Publications
  - In-House Company Magazines

Information Sources:
Categorization of Information Resources:

Subject Categorization

- An illustration of the breadth of scope, and the diversity, of information sources : (Continuation)
  - Product Brochures
  - Company Filings and Accounts
  - Reports of Court Cases
  - Financial and Industry Analysts' Reports
  - 'Freedom of Information Act' Documents
  - Consultancy Reports
  - Directories
  - Recruitment Advertisments
  - Business School Case Studies

Information Sources:

Categorization of Information Resources:

Subject Categorization

- 'Published' Literature and
- 'Grey' Literature

Information Sources:

Categorization of Information Resources:

Format Categorization

- The second form of framework is one based on format of information:
  - Printed Material (printed book, periodical, almanac, etc.)
  - Electronic Material (electronic book, bibliographic database, web page, etc.)

Information Sources:

Categorization of Information Resources:

Format Categorization

- General trend has been towards new formats being added to previous formats.
- Print-on-paper is still of considerable significance.
- Internet sites with relevance to pharmaceuticals are numerous, diverse, and rapidly changing.

Information Sources:

Categorization of Information Resources:

Format Categorization

- The ‘traditional’ online host systems are still an important means of access to information.
  - For pharmaceuticals, Dialog, Datastar and STN provide access to the key online databases.
- These host systems have been considerably changed under the influence of graphical interfaces and the internet.

Information Sources:

Categorization of Information Resources:

Format Categorization

- The continuing importance of the human expert should be noted;
- individual contacts are still important in a digital age.

Information Sources:

Categorization of Information Resources:

Location Categorization

- The third form of categorization divides resources according to location
  - Legislative and regulatory aspects

Information Sources:

Categorization of Information Resources:

Location Categorization

- Internal Information Sources:
  - Created and maintained within an organization,
  - Generally including unpublished and proprietary information.
- External Information Sources:
  - Publicly available resources.

Information Sources:

Categorization of Information Resources:

Type Categorization

- The fourth type of framework is one based on type of material:
- Resources are categorized as follows:
  - Primary
  - Secondary
  - Tertiary
  - Quaternary

Information Sources:

Categorization of Information Resources:

Type Categorization

- Primary: The orginal information
- Secondary: 'Worked over' knowledge
- Tertiary: they do not provide substantive 'subject' information in themselves
- Quaternary: Give access to resource listings

Information Sources:

Categorization of Information Resources:

Type Categorization : *Primary*

- Journal articles, pre-prints (paper and electronic)
- Reports
- Data tabulations
- Diaries
- Memoranda, letters, e-mail messages, postings to newsgroups
- Conference proceedings
- Thesis, dissertations
- Patents
- Standards
- Regulations and legislation
- Trade and Product information, technical manuals
- Course notes, interactive training materials, syllabi
- Company reports, financial data
- Organizations' and individuals' homepages
- …

Information Sources:

Categorization of Information Resources:

Type Categorization : *Secondary*

- Reviews and summaries of progress
- Indexing and abstracting services
- Data compilations, databanks
- Monographs, textbooks, treatises
- Reference works, encyclopaedias, handbooks, data tables
- Dictionaries, thesauri, classification schemes, glossaries
- …

Information Sources:

Categorization of Information Resources:

Type Categorization : *Tertiary*

- Yearbooks, directories
- Bibliographies, reading list, location lists of periodicals, list of abstracting and indexing services, library catalogues
- Literature guides, list of ‘recommended’ or ‘core’ resources
- Virtual libraries, subject gateways, specialist search engines, annotated lists of internet sites
- Subject listings of mailing lists and newsgroups.
- Listing of research in progress, indexes of expertise
- Guides to libraries, online host systems, other sources of information
- Guides to organizations
- Listings of academic departments and courses
- …

Information Sources:

Categorization of Information Resources:

Type Categorization : *Quaternary*

- Lists of lists
- Bibliographies of bibliographies
- Listings of library catalogues and organizations
- …

Information Sources:

Pharmaceutical Examples:

- Pharmaceutical examples of Primary Sources are numerous…
- The pharmaceutical area has a particulary rich set of Secondary Resources…

Information Sources:

Pharmaceutical Examples: *Indexing and Abstracting Services -1*

- Indexing and Abstracting Services are numerous…such as:
  - International Pharmaceutical Abstracts (pharmacy)
  - Excerpta Medica/Embase (medicine)
  - Index Medicus/Medline (medicine)
  - Chemical Abstracts (chemistry)
  - Biological Abstracts/Biosis (biology)
  - Toxline (toxicology and adverse effects)
  - Life Science Abstracts (various biological sciences)
  - Science Citation Index (all areas of science)

Information Sources:

Pharmaceutical Examples: *Indexing and Abstracting Services -2*

- There are other Indexing and Abstracting Services covering specific types of material… for example:
  - Derwent Drug File Literature Database
  - Pharmline Literature Database
  - Pharmaceutical news index
- Evidence-based practise is now of sufficient importance Best known is the:
  - Cochrane Database, from the Cochrane Collaboration, based in Oxford
- Other useful compilations:
  - NHS Centre for Reviews and Dissemination (http://www.york.ac.uk/inst/crd)
  - Sheffield University (http://www.shef.ac.uk/uni/academic/R-Z/scharr)

Information Sources:

Pharmaceutical Examples: *Electronic (online)Sources for Competitive Intelligence -1 (List-1)*

- Adis R&D Insight
- Adis Drugs Alerts
- Current Drugs Fast-Alert
- IMSWorld Drug Market-Companies
- IMSWorld Drug Market-Countries
- IMSWorld Patents International
- IMSWorld Pharmaceutical Company Profiles
- IMSWorld Product Launches
- IMSWorld Product Monographs
- IMSWorld R&D Focus
- Pharmaceutical and Healthcare ındustry News (PJB)
- Pharmaprojects (PJB)
- Pharmacontacts (PJB)
- Drug Data Report
- Drug News and Perspectives

Information Sources:

Pharmaceutical Examples: *Electronic (online)Sources for Competitive Intelligence -2 (List-1)*

- NME Express
- Derwent Drug File
- Derwent Drug Registry
- Derwent Veterinary Drug File
- IDIS Drug File
- Chemical Abstracts
- Derwent Biotechnology Abstracts
- Current Contents Search
- Scisearch
- Embase
- International Pharmaceutical Abstracts
- Medline
- Biobusiness
- Biocommerce Abstracts
- Health News Daily

Information Sources:

Pharmaceutical Examples: *Electronic (online)Sources for Competitive Intelligence -3 (List-1)*

- Marketletters Database
- Pharmaceutical News Index
- DIOGENES FDA Regulatory Updates
- NDA Pipeline: New Drugs
- Inpharma
- Adis LMS Drug Allerts
- Drug Information Fulltext
- IAC Pharmabiomed Business Journals
- Unlisted Drugs
- Reactions Database
- MDIS Pharmaceutical and Medical News

Information Sources:

Pharmaceutical Examples: *Information Sources for End-Users in a Pharmaceutical R&D Organization -1 (List-2)*

- External Literature Sources
  - Current Contents (bibliographic database covering all subjects areas)
  - Medline (bibliographic database of medical literature)
  - SciFinder (end-user searching of Chemical Abstract databases)
- External Competitor Intelligence and News Sources
  - Adis R&D Insight (competitor intelligence)
  - Newsedge (news reports and analysis)
  - Patent Preview (current awareness on patents)
  - Pharmaprojects (current awareness)
  - Iddb (competitor intelligence on drug substances)
  - WDI (compounds in development)

Information Sources:

Pharmaceutical Examples: *Information Sources for End-Users in a Pharmaceutical R&D Organization -2 (List-2)*

- External Cemical /Biological Data Sources
  - ACDFinder (commercial available chemicals)
  - Beilstein (chemical structures in the literature)
  - Martindale (pharmacopoeia)
  - Physicians' Desk Reference (factual drug information)
  - Reaction Browser (databases of published chemical reactions)
  - GPS (bibliographic data on gene and protein sequences)
- In-house Sources
  - Competitor Databases (in-house profiles of competitor compounds)
  - Competitor Highlights (in-house competitor news services)
  - Product Alert (in-house news service on company's own products)
  - In-house Database of Screening Results
  - In-house Industry News Service
  - Database of Internally Generated Documrnts

Information Sources:

Pharmaceutical Examples: *Information Sources for End-Users in a Pharmaceutical R&D Organization -3 (List-2)*

- It is worth noting that the organization also offers:
  - Translation Services
  - Library Services and Document Delivery
  - Electronic Journals
  - CD-ROMs
  - Literature and Patent Searching Services
  - Internal Document Record Services

Information Sources:

Pharmaceutical Examples: *Pharmacopoeias, formularies and drug guides are important sources of information about drugs -1 (List-3)*

- British National Formulary (twice yearly, British Medical Association and Royal Pharmaceutical Society of Great Britain)
- MIMS Monthly Index of Medical Specialities (Haymarket Publishing)
- ABPI Compendium of Data Sheets and Summaries of Product Characteristics (datapharm Publications)

and more general compilations:

- Martindale, the Complete Drug Reference (Pharmaceutical Press)
- Physicians' Desk Reference (Medical Economics Company, New Jersey)

Information Sources:

Pharmaceutical Examples: *Monographs and textbooks for reference information (List-4)*

- Goodman and Gilman's Pharmacological Basis of Therapeutics. McGraw-Hill.
- Meyler's Side Effects of Drugs. Elsevier. (annual)
- Stockly's Drug Interactions. Blackwell.
- Ganong's Review of Medical Physiology. Prentice Hall.

Other kinds of secondary sources of importance to drug information include:

- Handbooks, e.g.: Merck Index and Handbook of Pharmaceutical Excipients. Pharmaceutical Press.
- Encyclopaedias, e.g.: Encyclopedia of Controlled Drug Delivery. Wiley.
- Dictionaries, e.g. Dictionary of Antibiotics and Related Substances. CRC Press. & Dorland's Illustrated Medical Dictionary. WB Saunders.
- Thesauri, e.g. UK DIPG's Pharmline Thesaurus.

Information Sources:

Pharmaceutical Examples: *Selective list of printed medical information sources -1 (List-5)*

- Dictionaries:
  - Butterworth's Medical Dictionary. Ed. M. Critchley. London: Butterworth.
  - Dorland's Illustrated Medicinal Dictionary. Ed. D.M. Anderson. Philadelphia: WB Saunders.

- Drug Names and Synonyms:
  - Index Nominum, International Drug Directory. Swiss Pharmaceutical Society. Stuttgart: Medpharm Scientific Publishers.
  - Organic-Chemical Drugs and their Synonyms. Ed. M. Negwer. Berlin: Akademy Verlag.

Information Sources:

Pharmaceutical Examples: *Selective list of printed medical information sources -2 (List-5)*

- Drug Guides and Data Sources:
  - ABPI Compendium of Data Sheets and Summaries of Product Characteristics. Association of the British Pharmaceutical Industry. London: Datapharm Publications. (every 15 months)
  - British National Formulary. London: British Medical Association & Royal Pharmaceutical Society of Great Britain. (twice yearly)
  - MIMS, Monthly Index of Medical Specialities. London: Haymarket Publishing.
  - Physicians' Desk Reference. Montvale. NJ: Medical Economics Company. (annual)
  - Martindale, the Extra Pharmacopoeia. London: Pharmaceutical Press.
  - Therapeutic Drugs. Edinburgh: Churchill Livingstone.

Information Sources:

Pharmaceutical Examples: *Selective list of printed medical information sources -3 (List-5)*

- Textbooks:
  - Goodman and Gilman's Pharmaceutical Basis of Therapeutics. Ed. J.G. Hardman et al. New York: McGraw Hill.
  - Pharmacology. Ed. H.P. Rang et al. Edinburgh: Churchill Livingstone.
  - Textbook of Pharmaceutical Medicine. Ed. J.P. Griffin et al. Belfast: Queens University of Belfast.
  - Oxford Textbook of Medicine. Ed. D.J. Weatherall et al. Oxford: Oxford Medical Publications.
  - Davidson's Principles and Practice of Medicine. Ed. C.R.W. Edwards; I.A.D. Bouchier. Edinburgh: Churchill Livingstone.
  - Review of Medical Physiology. Ed. W.F. Ganong. East Norwalk: Lange.

Information Sources:

Pharmaceutical Examples: *Selective list of printed medical information sources -4 (List-5)*

- Drug Safety:
  - Meyler's Side Effects of Drugs. Ed. M.N.G. Dukes. Amsterdam: Elsevier.
  - Side Effects of Drugs Annual. Ed. J.K. Aronson. Amsterdam: Elsevier.
  - Drug Interactions. Ed. I.H. Stockley. Oxford: Blackwell.
  - Detection of New Adverse Drug Reactions. Ed. M.D.B. Stephens et al. London: MacMillan.

Information Sources:

Pharmaceutical Examples: *Selective list of printed medical information sources -4 (List-5)*

- Evidence-Based Practice:
  - Evidence-Based Medicine, How to Practise and Teach EBM. Ed. D.L. Sackett et al. Edinburgh. Churchill Livingstone.
  - How to Read a Paper, the Basics of Evidence-Based Medicine. T. Greenhalgh. London: BMJ Publishing Group.
  - Medical Statistics, a Commonsense Approach. Eds.M.J. Campbell; D. Machin. Chichester: John Wiley.
  - The Pocket Guide to Critical Appraisal. I.K. Crombie. London: BMJ

Information Sources:

Pharmaceutical Examples: *Selective list of printed medical information sources -5 (List-5)*

- Directories:
  - Medical Directory. London: FT Healthcare. (annual)
  - Medical Register. Cambridge: General Medical Council/Cambridge University Press. (annual)
  - Annual Register of Pharmaceutical Chemists. London: Royal Pharmaceutical Society of Great Britain.

Information Sources:

Pharmaceutical Examples: *Recommended medical information sources - 1 (List-5)*

- Reference Sources:
  - Martindale, The Extra Pharmacopoeia.
  - Goodman and Gilman's Pharmacological Basis of Therapeutics
  - Applied Therapeutics-The Clinical use of Drugs.
  - Meyler's Side Effects of Drugs.
  - Side Effects of Drugs Annual.
  - ABPI data Sheet Compendium.
  - British National Formulary.
  - American Society of Hospital Pharmacists Drug Information Monographs.
  - Drugdex (Full-text database)
  - Patient Information Leaflet Compendium (ABP)

Information Sources:

Pharmaceutical Examples: *Recommended medical information sources - 2 (List-5)*

- Secondary Services:
  - Inpharma
  - Clin-Alert
  - International Pharmaceutical Abstracts
  - Pharm-Line
  - Iowa Drug Information Service
  - Medline
  - Excerpta Medica
  - Review Journals, Especially Drugs and Clinical Pharmacokinetics

Information Sources:

Pharmaceutical Examples: *Recommended medical information sources - 3 (List-5)*

- Primary Sources:
  - Scientific Journals: Particularly British Medical Journal, Lancet, Journal of the American Medical Associations and New England Journal of Medicine.
  - Manufacturer's Promotional Materials.

Information Sources:

Pharmaceutical Examples: *Recommended medical information sources - 4 (List-5)*

- Organizations:
  - Royal Pharmaceutical Society.
  - National Pharmaceutical Association.
  - Institute for the Study of Drug Dependence.
  - Release (for drug abuse).
  - Poisons Information Service.
  - Committee on Safety of Medicines.
  - Employment Medical Advisory Service (part of Health and Safety Executive).
  - Malaria Reference Laboratory.
  - National Drug Information Specialist Advisory and Information Services.
  - Pharmaceutical companies, and other manufacturing industry.
  - University and civic libraries.
  - Schools of pharmacy.

Information Sources:

Pharmaceutical Examples: *Selective list of examples of relevant internet sites medical information sources -1 (List-6)*

- General Gateways and Search Engines:
  - SearchEngineWatch www.searchenginewatch.com
  - Pinakes List of Subject Gateways www.hwac.uk/libWWW/irn/pinakes/pinakes.html
  - BUBL Subject Gateway www.bubl.ac.uk
  - Omni Healtcare Gateway www.omni.ac.uk
  - Reuters Health eLine www.reutershealth.com
  - NHS Direct www.nhsdirect.nhs.uk

Information Sources:

Pharmaceutical Examples: *Selective list of examples of relevant internet sites medical information sources -2 (List-6)*

- Subject Specific Gateways and Portals:
  - World Wide Web Virtual Library for Pharmacy WWW.cpb.uokhsc.edu/pharmacy/pharmit.html
  - Pharmweb www.pharmweb.net
  - PharmInfoNet www.pharminfo.com
  - MedicineNet www.medicinenet.com

- Drug Indexes and Online Pharmacies:
  - RxList Internet Drug Index www.rxlist.com
  - Electronic Medicines Compendium www.emc.vhn.net
  - Allcures.com www.allcures.com
  - Pharmacy 2U www.pharmacy2u.co.uk

Information Sources:

Pharmaceutical Examples: *Selective list of examples of relevant internet sites medical information sources -3 (List-6)*

- Associations:
  - Association of the British Pharmaceutical Industry www.abpi.org.uk
  - Association of Information Officers in the Pharmaceutical Industry www.aiopi.org.uk
  - UK Drug Information Pharmacist Group www.ukdipg.org.uk
  - World Health Organization www.who.int

Information Sources:

Pharmaceutical Examples: *Selective list of examples of relevant internet sites medical information sources -4 (List-6)*

- Regulatory Authorities:
  - US FDA www.fda.gov
  - Medicines Control Agency (UK) www.open.gov.uk/mca
  - Committee on Safety of Medicines (UK) www.open.gov.uk/mca/csmhome.htm
  - European Medicinal Evaluation Agency www.emea.eu.int
  - National Institute for Clinical Excellence (UK) www.nice.org.uk/index.htm

Information Sources:

Pharmaceutical Examples: *Selective list of examples of relevant internet sites medical information sources -4 (List-6)*

- Pharmaceutical Companies:
  - Consult the list provided by sources such as PharmWeb and PharmInfoNet

- Information Providers:
  - United States Pharmacopoeia www.usp.org
  - Adis www.adis.com
  - PJB Publications www.pjbpubs.co.uk
  - National Library of Medicine www.nlm.nih.gov.
  - Chemical Abstracts Service www.cas.org
  - Biological Abstracts www.biosis.com

Information Sources:

Evaluating and Choosing Sources:

There is no a power
greater than knowledge
for future creation with
evaluating and choosing !

Information Sources:

Evaluating and Choosing Sources:

- One important task for the pharmaceutical information specialist and pharmacists.
- Argument against evaluating and choosing sources:
  - we can simly ‘use everything we have access to’. This is far from the truth…

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria can be outlined. They will generally include factors such as:
  - Authority,
  - Objectivity,
  - Currency,
  - Accuracy,
  - Coverage,
  - Added Value,
  - Completeness,
  - Format and Design,
  - Access,
  - Alternatives.

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Authority:

    Who provides the information and what are their qualifications to do so ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Objectivity:

    Is the information balanced or biased ?

    Does it reflect a particular point of view ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Currency:

    How regularly is the information updated ?

    Is the age of the information clear ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Accuracy:

    How reliable is the information ?

    What degree of detail ?

    What are the quality control procedures ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Coverage:

    What topics are covered ?

    in what depth, and with what degree of balance ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Added Value:

    Does the source provide evaluation, summarization, expert comment, and similar added value, or does it simply provide ‘raw’ data ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Completeness:

    Is the coverage intended to be complete, or is it limited in some way, e.g. Geographically or by time period ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Format and Design:

    How appropriate to the type of information being handled ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Access:

    What is the convenience and cost of access ?

Information Sources:

Evaluating and Choosing Sources:

- Some generally applicable criteria:
  - Alternatives:

    Is this the only source of this information, or is it one of many alternatives ?

Information Technology:

The Effective Use of Information Technology in Information Work:

- Use of computers and information technology in Pharmaceutical and Medicine Studies
- Information technologies are making a real difference

Information Technology:
Communication and Teamworking Tools:

- Groupware Applications and Technologies
- E-mail
- Newsgroups and Mailing List
- Electronic Diaries and Scheduling Tools
- Workflow Applications
- Knowledgebases
- Synchronous or “Real-Time” Groupware
- Intranet Groupware

Information Technology:

Internet:

- The internet is a worldwide system of computer networks.
- It interconnects a very large number of compatible publicly accessible networks through high-speed links on a global scale.
- It allows a user to communicate privately and publicly, send and retrieve information and find and view information.

Information Technology:

Internet:

- The internet grew out of an experimental network, called the ARPANET, built for the US government in 1969 and initially linking four US academic centres

- This was based on a 'packet-switch' network…

Information Technology:

Internet:

- During the 1970s the ARPANET carried much of the day-to-day US Department of Defense network traffic, and the TCP/IP network protocol...
- .In 1983 the military sites were split off from ARPANET and it became a purely civilian network
- Today the internet is a public facility accessible to hundreds of millions of people world wide...

Information Technology:

Internet:

- The use of the internet by the pharmaceutical industry:
  - One of the largest commercial sectors on the web
  - The first pharmaceutical company sites were set up to provide information …
  - There are now so many sites …

Information Technology:

Intranets:

- An intranet is an internal internet, closed off from the outside world.
- Many pharmaceutical companies have taken advantage…
- The systems are protected against unauthorized access from outside…
- Intranet technology offers advantages … over traditional database systems or knowledge warehouses in efforts to link corporate data to geographically dispersed sales and marketing professionals, or development data to a number of development sites.

Information Technology:

Extranets:

- Extranets are company intranets which have been extended in one of two ways.
- Many healthcare organizations have taken advantage…
- A common example of this in the healthcare organization is the provision by online database hosts of a customized environment for end-user search access…
- A sophisticated extranet will also allow them to forward information on topics to their office.

Information Technology:

Information Strategy for the NHS:

- The government's information strategy for the NHS was set out in the September 1998…
- *Information for Health* (www.nhsia.nhs.uk/strategy/full/contents.htm)
- Information for Health is a seven-year strategy that sets out an ambitious programme of IT developments for the NHS.

Information Technology:

Electronic Health Record (EHR):

- EHR is the concept of creating a lifelong electronic record of a patient's health and his or her interactions with the NHS,
- An electronic record will allow NHS staff instant access to patient records, 24 hours a day.

Information Technology:

Electronic Patient Record (EPR):

- The EPR will record information about the treatment and care that individual patients receive in hospital.
- The strategy proposes that over seven years all NHS trusts must implement specified minimum level EPR systems.

Information Technology:

NHSnet:

- NHSnet is a secure computer network for the NHS and is based on internet technology
- NHSnet is a wide area network (WAN) linking the local area networks in hospitals and other NHS organizations.
- At present NHSnet is poor in content. Access and bandwidth…

Information Technology:

National Electronic Library for Health (NeLH):

- The NeLH (http://nelh.nhs.uk) intends to take advantage of the rapid expansion of electronic media to help healthcare professionals in accesing reference material
- The NeLH (http://nelh.nhs.uk) intends to take advantage of the rapid expansion of electronic media to help healthcare professionals in accesing reference material…

Information Technology:

Information Services for Patients and the Public:

- The present NHS Direct is 24-hour national helpline and is an increasingly important vehicle for providing health information to members of the public.
- New technology such as internet technology will be used to allow NHS Direct to act as a convenient home-based gateway to the NHS.

Information Technology:

Telemedicine and Telecare:

- Telemedicine is a healthcare–related activity involving a professional and a patient (or one professional and another) who are separated in space, facilitated by the use of information technology.
- Telecare is similar but is delivered in the patient's home.
- Telemedicine can be used by general practitioners to obtain rapid second opinions from disease specialists.
- These technologies may also be used to reduce unnecessary travel and delays for patients by providing direct online access to NHS,

Information Technology:

Conclusion:

- There is a vast array of IT tools available to today's information managers, which when used effectively enable us to improve productivity and the distribution of information..
- This is a rapidly moving field, and if anything the pace of technology change is faster today that it has ever been…

Information Technology:

Conclusion:

- IT only provides the tools to enable us to develop faster and better access to information...
- These tools require skilled professionals for their effective use…

Information and Knowledge Management:

Introduction:

- The purpose of this chapter is to introduce some of the main concepts and issues in the management of information and knowledge, and to show their importance in a pharmaceutical setting....

- Some of the particular factors contributing to this are:
  - the multidisciplinary nature of pharmaceutical research and development, and of the subsequent marketing and use of medicines
  - the diverse and expanding basic science knowledge base
  - an increasingly globalized and competitive situation
  - increasing regulation, and increased consumer awareness.

Information and Knowledge Management:

Introduction:

- Overviews of information management in pharmaceutical settings are given by Abbott (1998), and by Henderson (1994), who argues that pharmaceutical companies have a unique managerial competence of fostering a high level of specialized knowledge within the organization while preventing that information base from fixing the company in the past Dieckmann & Whittall (1998) and Hamilton (1997) give accounts of information management in individual companies.

Information and Knowledge Management:

Introduction:

- Information and Knowledge Management chapter is divided into eight sections, following this introduction:
  - The first three sections deal with basic disciplines within the information and knowledge management frame-work: information resource management; knowledge management; and knowledge organization.
  - The next three sections deal with three significant processes: information mapping and auditing; developing information policies and strategies; and valuing information.
  - The final two sections deal with issues of current importance: information overload and information literacy.

Information and Knowledge Management:

Information and Knowledge:

- It is difficult, and unnecessary for the purposes of this chapter, to make a sharp distinction between the two concepts of information and knowledge.
- It is better to consider a spectrum of forms of information, from data, through information with varying degrees of structure, to knowledge, and perhaps wisdom..
- Knowledge is somehow a higher form, and lesser in volume, but this may sometimes be misleading.

Information and Knowledge Management:

Information and Knowledge:

- Various approaches to quantifying the degree of added value, and hence the extent of transformation of information into knowledge, have been proposed, though none has been generally accepted.

- Others, stemming from studies in the theory of computation, describe the 'logical depth' of the information, i.e. the number of steps necessary to recreate the original information.

Information and Knowledge Management:

Information and Knowledge:

- An alternative view of the information / knowledge dichotomy is to think of knowledge as being the form of information possessed by an individual,
- Information is then the means by which knowledge is transferred between individuals

Information and Knowledge Management:

Foundations for Information Management:

- In order to think about the three interlinked areas of information auditing, information policy and information value.

- The answers to three key questions provide a foundation:
  - What do the people who work for this organization need to know in order to act to achieve its objectives?
  - What information resources do they need to maintain their knowledge?
  - In using information and applying knowledge, how do they need to interact with information, with one another and with the organization's "outside world" ?

Information and Knowledge Management:

Foundations for Information Management: Pharmaceutical Exemplification:

- A pharmaceutical example, based on real·life case studies carried out by one of the chapter, will be used throughout this chapter to give context to the general points made.
- Three key objectives of a large research·based pharmaceutical firm are:
  - to identify new compounds for exploratory research,
  - through the research and development programme, to determine which compounds have appropriate safety and efficacy,
  - to bring these compounds to registration.

Information and Knowledge Management:

Foundations for Information Management: General areas of knowledge required:

- medical research
- health service
- markets (actual and potential)
- pharmaceutical industry
- competitors and their products
- social and economic environment
- company's own past and current research
- company's critical success factors for evaluating exploratory research proposals
- developments in research methods and technologies
- regulatory requirements, institutions, relevant legislation
- customers
- suppliers
- knowledge of sources and skills in searching them
- relevant developments in higher education.

Information and Knowledge Management:

Foundations for Information Management: Information resources to maintain required knowledge:

- relevant databases
- periodicals
- abstracting services
- statistical series
- market reports
- competitor intelligence service
- government publications
- database of company's own research projects, accessible on company intranet
- Human Resources database with answers to questions such as: who knows about...? - who has skills in ... ? who has training in '" ?
- contacts database
- customer database
- conference reports
- company's own information products, internal and external
- supporting systems/IT infrastructure, including intranet and WWW access.

Information and Knowledge Management:

Foundations for Information Management: Necessary information flows and interactions for making use of knowledge and information:

in-house

- researchers
- information/knowledge specialists
- systems/IT
- HR
- legal
- sales
- marketing
- senior management.

External

- customers
- suppliers
- professional and trade bodies
- researchers in other companies
- regulatory institutions.

Information and Knowledge Management:

Information Resource Management:

- It is now customary, in information management circles, to regard information as a resource. Hence the term 'information resource management'. Information is sometimes described more specifically as the 'fourth resource', by analogy with the other three main kinds of resource, which may be possessed by an organization: material, human, and financial..

- Some commentators argue that information should not be regarded as a resource at all, but something more like a public good.

Information and Knowledge Management:

Information Resource Management:

- Typical is the list given by Eaton & Bawden (1991):
  - Information is acquired at a definite measurable cost,
  - Information possesses a definite value, which may be quantified and treated as an accountable asset ,
  - Information can be consumed, and its consumption can be quantified

  cost-accounting techniques can be applied to help control the costs of information,
  - Information has identifiable and measurable characteristics,
  - Information has a clear life·cycle: definition of requirements, collection, transmission, processing, storage, dissemination, use, disposal,
  - Information may be processed and refined, so that raw materials (e.g. databases) are converted into finished products (e.g. published directories)
  - Substitutes for any specific items or collection of information are available, and may be quantified as more or less expensive,
  - choices *are* available to management in making trade-offs between different grades, types and prices for information,

Information and Knowledge Management:

Information Resource Management:

- Information possesses certain unique, even paradoxical, qualities. Examples of these qualities (Eaton & Bawden 1991) are:

  • Although information is instantiated in physical objects, information itself is intangible, a collection of 'abstract objects‘,

  • Information is expandable, increasing with use,

  • Information is compressible, able to be summarized, integrated, etc.

  • Information can substirute for any other resource in many circumstances,

  • Information is transportable virtually instantaneously,

Information and Knowledge Management:

Knowledge Management:

Knowledge is classification. (John Dewey)

- ⇨ Knowledge management (hereafter K.M) is an over-used term, with many slightly varied definitions.
- ⇨ For our purposes, it can best be regarded as a variant on, and extension of, information management. Its major feature is that it deals with a kind of 'soft', 'tacit' or 'implicit' information-'knowing how', 'knowing who' and 'knowing why'-often ignored by conventional information systems, which concentrate on hard facts and figures.

Information and Knowledge Management:

Knowledge Management:

- Quite what is involved in KM is a matter for debate. .
- . It is now generally agreed that cultural aspects are equally, if not more, important. In this view, the most important aspect is to promote, and facilitate, a willingness to share knowledge..
- There is still, however, a reluctance to give due weight to knowledge content and organization.

Information and Knowledge Management:

Knowledge Management:

It is best to regard KM as comprising three linked aspects:

- *Technical:* the means by which knowledge may be stored, retrieved and communicated.
- *Cultural:* the ways in which the organization adapts its reward and recognition systems, and other behavioural norms,
- *Intellectual:* the means by which the knowledge to be managed can be identified-issues of 'content'-and the ways in which it can be represented and organized for subsequent access.

Information and Knowledge Management:

Knowledge Management:

This third aspect is crucial for the success of KM, but is often overlooked in an enthusiasm to get the first two components right.

- ⇨ Pharmaceutical information services are likely to become involved in knowledge management in one of two ways.
- ⇨ Others focus on systems for the identification of individual expertise--the 'expertise index' or 'electronic yellow pages'-on the basis that the only way to transfer such knowledge is by putting the enquirer in direct contact with the knowledgeable person.

Information and Knowledge Management:

Informatiom Mapping and Auditing:

Definitions:

The definition proposed by the Aslib Information Resources Management Network has become a standard in the UK: a systematic examination of information use, resources and flows, with a verification by reference to both people and existing documents, in order to stablish the extent to which they are contributing to an organization's objectives.

Orna (1999) defines what the audit examines as:

- the information an organization holds which can be turned into knowledge by people and applied in their work to meet its objectives
- the resources for making information accessible to those who need to turn it into knowledge
- the ways in which it uses information to further its objectives
- the people who are involved in using information
- the 'tools' it uses for doing things with information
- the criteria it uses to assess the costs and values of information.

Information and Knowledge Management:

Informatiom Mapping:

Information auditing as just described is comparable to the 'information resource discovery process' described by Burk & Horton (1988) in their *Infomap: A complete guide to discovering corporate information resources.*

This has four main steps:

- Preliminary resource inventory-starting from a tentative model of what you expect to encounter
- Examination of the cost and value of entities identified in the first step with the aim of getting 'some kind of cost/value ratio ... even if only rough approximations'
- Analysis: examination of the findings from the first two steps to find where resources are distributed, the basic nature of each, the magnitude and location of costs and values. This leads to 'charts and maps' which form springboards for raising questions on management policies, etc. and highlight gaps, overlaps and redundancies
- Synthesis: assessment of the quality of identified resources expressed in terms of relative strengths and weaknesses.

Information and Knowledge Management:

Essential Resources and Support for Information Auditing:

- Support from top management and clear reporting line to top level of decision making via management champion
- people with knowledge, experience, judgement and standing to run it
- time allowance
- guaranteed access to people and documents
- appropriate finance (information auditing need not be a costly business, compared with other expenditures which are accepted without question.

Information and Knowledge Management:

Planing – Selecting Key Areas for Projects:

- The safest and most productive way of running an information audit is through a series of projects;
- It allows learning on the job with minimal risks, and gives the chance of 'quick wins' that gain support for the process.
- The best areas are those where information has high strategic importance and/or potential for adding value;
- A project area should have a clear boundary and not be too big;
- It should be tackled by people who are information-aware and/or have a problem they really want to crack

Information and Knowledge Management:

Planing – Selecting Key Areas for Projects:

Health Organization Example:

Following structural changes in the health organization mentioned earlier, which resulted from a study of how its investment in IT was supporting the business, the organization set up two auditing projects:

- Analysis of documents it produced for regulatory submissions, to identify the actual and potential information sources and the way information was used in submissions
- Investigation of how systems development related to organization information needs and to researchers' work tasks.

Information and Knowledge Management:

Who does it and who do they need to talk to?

The current consensus is probably that the audit should be managed and controlled from inside the organization, with the main work done by the organization's staff-drawing on appropriate internal and external expertise and support.

The core audit management team needs people of good standing, with strategic knowledge of the organization and ability to interact with others. Project management groups should involve those close to the project area.

The main groups of people with whom information auditors need to talk are: the 'guardians' responsible for managing specific kinds of information on behalf of the organization; and the stakeholders-people who need particular kinds of information in their work, and therefore have a legitimate interest in how it is managed.

Information and Knowledge Management:

Methods

There is no single best method of information auditing.

A variety of methods can be successffully used .

They include:

- ✓ Analysis of documents and databases;
- ✓ Observation of people carrying out information tasks and trying out tasks for oneself;
- ✓ Structured interviews;
- ✓ Cross functional working groups;
- ✓ Questionnaires;
- ✓ Visual representations;
- ✓ Soft systems analysis.

Software support for some of these methods is available.

Information and Knowledge Management:

Health Organization Example:

Methods used in the exemplar Health Organization for the projects:

−Cross-functional and cross-discipline groups for exchange of ideas;

−User workshops to formulate problems, run by users with systems/IT specialists as a knowledge resource, and a 'management champion' to hold the ring;

−Managers' workshops, to look at the problems identified by user workshops, selected the agenda of the next stages. The output consisted of a list of all systems for which users had stated requirement; and the facts on document architecture.

Information and Knowledge Management:

Key Areas:

- ✓ Information resources;
- ✓ Guardians and stakeholders;
- ✓ Information flow and interactions;
- ✓ Systems and technology supporting information use;
- ✓ How the cost-effectiveness of information is assessed.

A lot of preparation time needs to go into deciding the questions to ask and how to ask them, trying them out to ensure that they are unambiguous, and making sure that all the people concerned in finding the answers agree about what they are doing.

The audit team needs to meet frequently, to exchange news of what they are finding, resolve unexpected problems, note points that look likely to require recommendations for action.

Information and Knowledge Management:

Interpreting the findings-matching what is with what should be

The heart of information auditing is matching 'what is' with 'what shouJd be' to identify good and bad matches in areas where information is of high strategic importance.

The picture of where there is convergence or divergence between the two makes the foundation for meaningful presentation of results, and proposals for action.

Information and Knowledge Management:

Health Organization Example:

- ✓ A variety of Computers and software were in use and users were often without any support
- ✓ There was no standardization on word-processing soft"Jare
- ✓ End-user computing projects were going on in many locations without any overall evaluation and coordination
- ✓ There were no agreed priority criteria for ranlcing user requests for professionally developed systems to support research, and nobody had responsibility for coordinating these requests
- ✓ Incompatible equipment slowed data transfer
- ✓ There were no standards for content and layout of internal documents
- ✓ There were organizational problems in getting data from support departments.

Information and Knowledge Management:

Health Organization Example:

Actions Recommended:

- ✓ Selection of integrated end-user system development kit
- ✓ Corporate standards for systems development, and adoption of single word-processing standard throughout organization
- ✓ Set of critical success factors based on business objectives to be used as criteria for allocating priority among requests for systems development
- ✓ Working party on how reports were compiled, with remit of defining standards
- ✓ Continued monitoring by 'management champion' and presentation of findings to the organization's board.

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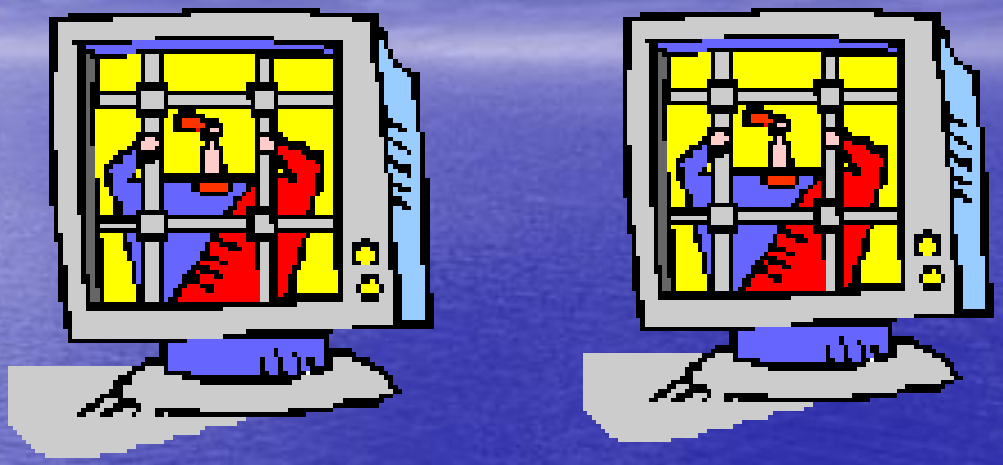

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