

# Consultation of the Vidal electronic dictionary in the Rouen University Hospital: analysis of the first year of utilisation (1992-1993)

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Medical documentary information systems, integrated into the Hospital Information System, have been defined as a necessity and a priority in the Rouen University Hospital.

Information about drugs is essential to patient care and management. Computerised access to the French drug information reference "Dictionnaire Vidal" has been chosen as the first step of our medical documentary system. The aim of this application is to provide on-line access to drug monographs with queries and displays as close as possible to the printed edition of the Vidal Dictionary. Headings specific to the Rouen University Hospital were included : availability of a drug in the pharmacy and its cost. Electronic Vidal is operational on IBM and BULL mainframes and on Unix platforms. In the Rouen University Hospital, Electronic Vidal has been in use since November 1992 on the 800 terminals and microcomputers located in care units. In 1993, daily, 150 accesses are performed and 270 drug monographs are displayed ; in 1998, figures are nearly doubled (294 accesses and 481 drug monographs) . The next step will be the development of the access to drug interaction data. Electronic Vidal will become the core of the drug documentary information system.

## Key-words

databases, factual; drug information services;

## 1. Introduction

The constant provision of up-to-date information in an hospital is of crucial importance for good clinical practice but dissemination of relevant medical reference material is an expansive and time consuming activity.

Availability of reliable and frequently up-dated information and knowledge is necessary to improve directly patient care and management. It can also acts indirectly by avoiding time loss due to information search. Recent improvement in the information management technology have provided new opportunity to face the challenge.

The achievement of computer-based 'information and knowledge banks' was defined as a priority in our hospital.

'Information and knowledge banks' are necessary when:

- 1) this information is of limited access on existing information materials such as books and reviews;
- 2) this information has to be frequently searched and consulted by a large population of end-users;
- 3) the information and knowledge update have to be easily, quickly and simultaneously updated on all sites of consultation; Implementation of an 'information and knowledge banks' implies:
  - 1) the previous creation of a scientific and technical committee in charge of organisation, evaluation and decisions about the 'information and knowledge bank';

- 2) the choice of information and knowledge sources and suppliers; it have to be admitted as a reference for all the end-users;
  - 3) a fast information search and retrieval system as convenient and simple as possible, optimising the recall and not the fallout;
  - 4) an ergonomic design allowing an easy and reliable screen consultation.
- Among the information searched daily, drug-related topics are particularly important because of the growing complexity of drug-management and the number of critical changes in drug specifications that may occur at any time. Frequency of updating is a key-feature in this field.
- The drug-related information are checked several times a day by a large population of end-users in care units, such as physicians, nurses, students, secretaries, etc. In France, the most used reference document is the Vidal dictionary. It compiles the regulatory texts of drug characteristics which are released along with the marketing authorisation given to pharmaceutical companies and validated by the French Ministry of Health (at least for the drug monographs released after 1979). One monograph is released for each drug and all the monographs have the same headings pattern which complies with the European guidelines for drug monographs (EEC. Directive 83/570 art. 4bis). The monograph sequence is shown in table 1.

Table 1  
Monograph sequence

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1. Brand name
  2. Pharmaceutical form and presentation
  3. Composition : - actives substances and excipients
  4. - dosage and unit dose
  5. Pharmacokinetics
  6. Pharmacological properties
  7. Indications (efficacy mentions)
  8. Contra-indications
  9. Warnings
  10. Precautions of use :
  11. - use in pregnancy
  12. - nursing mothers
  13. - drug interactions
  14. Vigilance and driving
  15. Side effects and adverse reaction (frequency and gravity)
  16. Dosage and administration
  17. Storage (exceptional condition)
  18. Overdosage
  19. Legal category
  20. Product licence number and year marketed
  21. Public price
  22. Manufacturer
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Usually, the topic of a single consultation of a drug monographs in the printed edition is limited to one heading. Therefore it is easy to display it on a computer screen.

The compliance of this kind of information to the previous enumerated criteria was obvious. That is why the computerisation of information and knowledge about drug became the first step of our 'information and knowledge bank'.

## **2. Description of the Electronic Vidal**

The choice of the Vidal dictionary as the drug reference book led to a partnership with the editor of the Vidal dictionary, the OVP company. The rules of this partnership are the following:

- 1) the drug text must be exactly as it could read in the printed edition of the Vidal dictionary; no information could be added to the original text;
- 2) the source files of drug monographs and indexes are provided and updated by OVP;
- 3) the computerisation of the Electronic Vidal is performed by the Information System and Informatics Department of the Rouen University Hospital;
- 4) the marketing of the data and the retrieval software is ensured by OVP.

Additive headings were included, allowing each hospital to link specific information to the monographs e.g. availability of a drug in the hospital pharmacy and its hospital cost per unit.

The software of Electronic Vidal was developed with Pacbase (workbench of the CGI company). In Rouen, it is operational on a IBM mainframe 3090 (MVS). Bull DPS 7 version (TDS and GCOS7), IBM ES 9000 (VSE/ESA) version and Unix version are also available.

Document indexes was performed by Vidal scientific group which also realised the text formatting specific to the screen lay-out, taking into account the screen limitations (25 lines x 80 rows, fixed space font, 16 colours or monochrome brightness levels). This formatting was realised to preserve as far as possible the look and spacing of the original printed document.

In Rouen, the computer network with 800 terminals and microcomputers located in care units provides an easy access to the Electronic Vidal.

The menu-driven software offers three ways of access : trade name, substance name and therapeutic classification. Regardless of the way of access, the end-user is offered the display of the 24 headings of the Vidal Dictionary.

Only the first letters of the names of drugs or substances need to be keyed in. If the keying is non ambiguous, the corresponding monograph is displayed, otherwise the list is displayed starting from the first matching name. The user may display any part of the monograph by vertical scrolling, one page or one line at a time. The current monograph title is repeated on every screen together with the indication of the availability of the current drug at the hospital pharmacy.

One key-press gives access to the list of the other drugs containing the same active substance as the current drug. Another key-press give access to a short list of those which are available at the pharmacy and shows the hospital cost for each.

The way of access by the therapeutic classification requires only the three first letters of any therapeutic class or sub-class. The entire list is also available on a key-press. The corresponding list of drugs is available for each class.

Headings specific to the university hospital are accessed from the screen which displays the monograph content. This heading contains the list of the corresponding drugs available in pharmacy, their hospital cost, the last updating date and its author. A comment may be linked with each drug.

The monograph and their indexes are updated quarterly by OVP. The hospital-specific information is updated by the hospital pharmacist. The access to the Electronic VIDAL is available only for authorised health professionals: each user has to enter his identification and his password.

## **3. Results : statistics of the Electronic Vidal during the first year of utilisation**

The Electronic Vidal is in use in the Rouen University Hospital since November 1992. Reactions to implementation of this first data base have been remarkable. From that moment, the printed edition of the Vidal dictionary have not been available in any locations of care unit, excepted for those which were not equipped with terminals, specially the outpatient rooms.

Several statistical indices was included in the software design. This numeric data emphasise the quantitative importance of consultation.

Since the availability of the electronic dictionary (between November 23rd 1992 and October 31st 1993), 52760 accesses were performed and 90635 monographs were displayed. An average of 155.2 daily accesses are performed, corresponding to the daily consultation of 266.6 monographs; an average of 1.72 drug text is displayed per connection. During the second trimester 1998, the numbers have nearly doubled: an average of 294 daily accesses are performed, corresponding to the daily consultation of 481 monographs; an average of 1.63 drug text is displayed per connection

Each month 40% of overall monographs are displayed. After one year, three quarter of monographs are displayed at least once.

The access by trade name is the most frequent (91%), followed by the access by substance name (5.8%) and the access by therapeutic class (3.4%). The accesses are spread out in the 60 departments of the hospitals (median of 79 monthly accesses with a maximum of 288 and a minimum of 2). The three biggest consumer departments of our hospital are : intensive care unit, pneumology and cardiology.

The typology of end-users are the following: in the absolute: nurses (36.7%), residents (19.3%), physicians (13.7%), medical students (9.8%), secretaries (9.5%), pharmacists (5.1%), informaticians (3.4%), and midwives (2.5%). Divided by their respective number in the hospital, the pharmacists are the biggest consumers of the Electronic Vidal with 25 accesses per month and per pharmacist followed by the residents (3.4 accesses per month and per resident), the medical students (1.8 accesses per month and per student), the physicians (1.6 accesses per month and per physician) and the nurses (1.4 accesses per month and per nurse).

During the first year of utilisation, the four most displayed monographs are Mopral(omeprazole) with 337 accesses (0.4% of the overall accesses), Augmentin (amoxicilline and clavulanic acid) with 317 accesses, Prozac (fluoxetine) with 315 accesses, and Depakine (valproic acid) with 307 accesses. Sorted by active compound regardless of multi active compound drugs, the three most displayed active compound are: paracetamol (1600 accesses and 2% of the overall accesses), ascorbic acid (1386 accesses), and amoxicillin (940 accesses). The most frequently displayed monographs belongs to the following therapeutic classification: cardiology (10655 and 17.6% of the overall accesses), infectiology (8204), and neurology & psychiatry (7532). The five most frequently displayed therapeutic classes are : antihypertensive agents (5351 and 6.6% of the overall accesses), antianginal drugs (3225), drugs of cardiac failure (2305), penicillins (2045) and anxyolitics (1938). The typology of the displayed headings are the following: composition (47%), indications (19.1%), posology (18.3%), contra-indications (9,1%), public cost and name of the manufacturer (3.9%), and overdosage (2.7%). The end-users are consulting the hospital specific headings in 3.9% of the connections. The average number of connections of Saturdays and Sundays are representing respectively 53% and 34% of the average number of connections of a weekly day. On the nyctohemeral period, there are two maximum of consultation: one at 11am (with 54 connections in an hour) and the other at 15pm (32 connections in an hour).

## 4. Discussion

Several textbooks and dictionaries contain information about drugs, including properties and management guidelines. Data have in some occurrences better structure than in the Vidal Dictionary which helps to an easier computerisation. However, the health care professional end-user do not know them well, their update is less reliable and the information is not validated by any official committee. That is why the Rouen University Hospital has chosen the Vidal Dictionary as the reference as the electronic textbook about drugs.

More generally, the achievement of 'information and knowledge banks' in hospitals is far from easy: it is difficult to index and maintain information and knowledge, there is a lack of a normalised medical language [1]. Documentary information systems must overstep these problems; some research projects are under way : UMLS project [2], natural language processing.

Information about drugs are consulted every day. Several drug information banks already exist in France and in the world : BIAM (French acronym for automated drug information bank) since 1984

[3], French THERIAQUE [4], both accessible by videotex (Minitel), Drugdex [5], Electronic PDR [6], Europharm, CD-ROM containing several European drug dictionaries, such as the German Rote Liste, the Italian Farmadisco, the English Martindale, the Swiss Compendium and the French Vidal. Outside Vidal CD-ROM, Vidal Dictionary is also available on Data Discman, ideal tool for attending health care professionals.

At the contrary, Electronic Vidal is implemented in an hospital computer network. Its exploitation cost is independent of number of connections. It contains only officially validated information. Its index have nonetheless several limits. It is not possible for the moment to use full-text or Boolean queries, using key-words (e.g. searching of all drugs which are contra-indicated in "myasthenia" using the word "myasthenia" in the heading contra indication). Electronic Vidal has few other limits : some French drug are not included in the Electronic Vidal, drug-drug interactions are not yet available. Some of these limits will be fulfilled in 1994.

Vidal electronic dictionary shows many advantages. Using the network facilities with many terminals, it can be accessed simultaneously on 800 screens instead of 220 printed editions. This limited number was responsible of the use of old versions. Quarterly updates released by OVP give access to fresh information. Headings specific to the university hospital extent the range of information with data that where not of easy access before. This information may help the prescripitor in adapting therapy to the available commercial products in the pharmacy. To be aware of the drug price may incite the prescripitor to consider the cost of a prescription.

These advantages may explain the importance of the impact and the number of daily connections realised by health care professionals of our hospital although the functionality's of Electronic Vidal are certainly not optimally utilised; particularly the elementary access by trade name is the far most frequent. The foreseen evolution will increase the coverage and treatment of drug-related information.

The Vidal electronic dictionary will be the nucleus of true 'information and knowledge bank' which will associate official information and information specific to the hospital, helping to disseminate each other in a synergistic process.

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