



Characteristics of a Hybrid Picture Archiving and Communication System Serving a Neurosurgical Facility

Carolina Martins MD PhD; Thalita Santos RN; Luiz Roberto Aguiar MD; Marcelo Valença MD; Valdenice Melo RN; Gilberto Falbo; Caio Souza-Leão MD

Hospital Pelópidas Silveira - IMIP/SES/SUS, Recife, Brazil, Universidade Federal de Pernambuco - UFPE, Recife, Brazil, Pontifícia Universidade Católica do Paraná - PUC-PR, Brazil



Introduction

Hospital Pelópidas Silveira (HPS-IMIP-SES-SUS) is a 300-bed, neuro-specialized facility in Northeast-Brazil. BIC-HPS is a web-based, hybrid picture archive and communication system designed to store clinical images of patients and serve as a research databank.

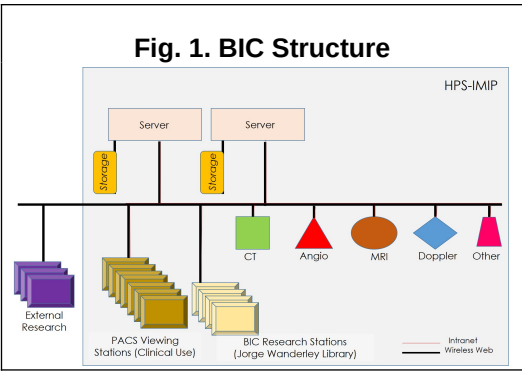
This study describes the characteristics of a hybrid picture archive and communication system to serve a neurosurgical facility.

Methods

Specific needs for a web-based, hybrid picture archive system that gives support to clinical and research uses have been devised and compared to the literature.

Results

Information technology and software allow for storage of clinical images. This process ensure quick access to clinical images into a medical facility, guarantees longevity of data and, following ethical principles, can comprise an appropriate databank for research. Images stored can be measured/compared, reconstructed/analyzed on its anatomical, clinical, pathological and anthropological aspects. The requirements and characteristics of such a system to attend the needs of a neuro facility should be divided to include a) Infrastructure, b) Capture, c) Visualization, d) Storage, e) Retrieval of images (Fig. 1).



1. Capture/Storage

Involves gathering all clinical image acquired at the Hospital, through the web, to servers. At HPS-IMIP, data from X-Ray, CT, angio, MRI and Ultrasound (Fig. 2) are comprised and involve a dozen equipments. Simultaneous back-up is made outside the physical premises of the Institution. A mirror, anonymized image of each patient data is also automatically stored, simultaneously feeding the research databank, updated in parallel to the clinical image bank.

Fig. 2. Image Production at HPS-IMIP-SES-SUS per Month

Image Type	Exams/Month	Number of Images	Matrix	Volume
X Ray - CR	2.000	6.000	—	60 GB
CT	850	340.000	512 X 512	170 GB
MRI	200	50.000	512 X 512	25 GB
Angio Cardio	200	1200	512 X 512	45 GB
Ultrasound/Doppler	300	3.600	256 X 256	0,6 GB
Angio Neuro	200	7200	512 X 512	3,66B
TOTAL	3750	408.000	—	304,2 GB

2) Visualization/Retrieval of Images

User type 1 of the BIC databank accesses the system for daily clinical use of image data, possible throughout the Institution. For research, signature privileges differ (User type 2), are bounded to a Research Project previously approved at the Institution and is possible at the Research Stations located at the Hospital library. Besides online and other bibliographical references, text editing and reference organizing softwares, the BJW library houses working stations equipped with FDA-approved image treatment softwares. In the future, external researchers will be able apply and consult the databank (Fig. 3).

Fig. 3. Jorge Wanderley Library (BJW-HPS)

BJW-HPS houses the research working stations for BIC and provides infrastructure for researchers

3) Team/Ethics

BIC-HPS has a technical team comprised of IT and health professionals for monitoring, troubleshooting, granting access and improving the system. Ethical precautions are taken according to recommendations of the Institutional Ethics Committee and BIC is closely monitored by a Committee of experts from other (local and national) Institutions.

Conclusions

BIC is the first hybrid (clinical/resarch) PACS in Brazil. It is housed in a public, neurological and neurosurgical facility in Northeast Brazil. This study can provide useful information to foster creation of other collections of scientific interest in the neurosurgical field.

Learning Objectives

1. Understand the fundamentals of a picture archiving system useful for clinical use and research

References

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