The non radiological imaging phycisians health and social care essay

In 2011, the Southern Philippines Medical Center acquired a Picture archiving and communication system (PACS) in the hope to help facilitate fast, speedy and reliable, cost-effective radiological imaging portals. On its one year of operations, a number of issues were raised like needs of additional viewing stations, medical grade and non-medical grades alike, offering of seminars and workshops to help end-user learn how to use the viewing stations for better visualization of images, and problems on retrieving images and their storage. These issues were raised time and again in the hospital's ER, OPD, MEDMANCOM, EXECOM and Training Office meetings. But a detailed evaluation and assessment on the aforementioned issues were not validated. This study is a timely assessment on SPMC-PACS one year operations as perceived by our client.

Review of Related Literature

Picture archiving and communication system (PACS) is a medical imaging technology which provides economical storage of, and convenient access to, images from multiple modalities. Electronic images and reports are transmitted digitally via PACS; this eliminates the need to manually file, retrieve, or transport film jackets.(1)Electronic health information systems, such as picture archiving communication systems (PACS), are commonly believed to reduce the need for duplicate testing.(2) However, empirical data to support this belief in Southern Philippines Medical Center are not available. PACS allows for a near filmless process, with all of the flexibility of digital systems. It also removes the costs associated with hard film processing and releases valuable space previously used for film storage. Most importantly, PACS is helping to transform patients' experience of the

care they receive across the NHS. It does this by enabling a speedier diagnosis and by removing the risk of images being lost or misplaced. (3)Picture Archive and Communication Systems (PACS) are comprehensive management systems for diagnostic imaging studies that are increasingly used in hospitals and health care systems. It is essential for PACS to be an integrated part of the total hospital electronic information system in order to be maximally effective. The main objective of any new information system in health care is to improve the effectiveness and efficiency of health care. Although the initial implementation of PACS is costly, the ability for care providers to have faster access to diagnostic imaging information allows care to be delivered more expediently, which improves the overall quality of care patients receive. (4)Picture archiving and communication systems (PACS) present an opportunity to radically change film-based radiology services both inside and outside the hospital setting. In the past, the usual medium for capturing, storing, retrieving, and viewing radiology images was hard copy film.(5)Conventional film and paper-based information systems are currently being replaced by information technology in many hospitals and imaging centers. Radiology information systems (RIS) typically support administrative functions, frequently also reporting of results, while picture archiving and communication systems (PACS) typically acquire, store, transmit, display, and process digital images.(6)One of the main benefits that PACS provides is the ability to provide a timely delivered and efficient access to images, interpretations and related data throughout the organisation. This helps to ease consultations between physicians who can now simultaneously access the same images over networks, leading to a better diagnosis process.(7)It is also beneficial to physicians in emergency

situations, as they need not wait for long periods in order to view a patient's radiological images as these are instantly available on the network when ready.(7)Another feature of PACS is the ability to digitally enhance the images, providing more detailed and sharper images. This improves diagnostic capabilities at radiological examinations.(7)The high costs of PACS has led to vendors offering mini-PACS, which is a cheap alternative for organisations that cannot afford the cost of a full PACS system or those seeking to implement some form of a digital image management system but would rather start off with something small.(7)

Advantages of PACS

Rapid access to critical information to decrease exam-to-diagnosis time. This is especially useful in emergency and operating rooms.(7)Elimination of film, handling and storage costs.(7)Images can be easily shared between reading radiologists, other physicians and medical records.(7)Images can be archived at secure locations using database servers manages the transfer, retrieval and storage of images and relevant information; the archive provides permanent image storage.(7)Radiologists can access soft-copy images instantly after acquisition to expedite diagnosis and reporting at the almost any available workstation.(7)Web servers can be used to most cost-effectively share images with other departments, even referring physicians across town. They can access the images using the Internet or the local intranet.(7)No similar studies done in this institution upon the advent of PACS system in November 2011 until this day. Published studies for national and regional levels are likewise not demonstrated on literature review. Thus, this serves as a pilot study.

Research Problem

The increasing number of patients in the emergency room (ER), in-patient and out-patient, department as well as in the operating room entails faster, efficient, safer, and larger storage space thus the need to avail of the PACS coupled with problems with regard to lost films, film packet, storage problems, immediate access to and availability of images and immediate access to radiology reports.

Significance of the Study

A picture archiving and communication system (PACS) is a computerised means of replacing the roles of conventional radiological film: images are acquired, stored, transmitted, and displayed digitally. When such a system is installed throughout the hospital, a filmless clinical environment results. The main purpose of building a complete filmless and paperless system for a hospital is to improve the quality of medical and patient service. At the same time, its cost-effectiveness is also important and we need to give due consideration in the benefit on hospital management. This study aims assess how useful the PACS in service delivery for radiological imaging using x-ray, CT scan and MRI requests from non-radiological imaging physicians.

OBJECTIVES

General Objectives

1. To assess the usefulness new picture archiving and communication system (PACS) in Southern Philippines Medical Center on its one year operation.

Specific Objectives

1. To determine the users point of view with regard to the new PACS2. To determine the advantage and disadvantages of a PACS3. To determine the problems encountered by non-radiological imaging physician of the Southern Philippines Medical Center on their one year use of PACS.

DEFINITION OF TERMS

Digital imaging and communications (DICOM) systems: A standard for the facilitation of electronic medical imaging, consisting of a standardized image format and a standardized communications protocol.(4)Electronic health record (EHR): An electronic system that is used to capture, retrieve, store, transmit, manipulate, and link any information that relates to the past, present, and future health or conditions of any person for the primary purpose of providing health care or health-related services. EHRs are usually based on the Health Level Seven (HL7) standard.(4)Health care information system (HIS): An integrated system of both hardware and software that is used by a health care provider to support and conduct all information aspects of providing quality patient care and the business of health care. (4)Radiology information system (RIS): An electronic system that is used to manage medical imaging information such as diagnostic imaging orders, scheduling, and diagnostic imaging interpretations/reports and to prepare billing information. RIS is usually based on the HL7 standard.(4)Picture Archive and Communication System: A system for digital image data management. The main components of PACS include image acquisition, data management, data transmission, image display, interfaces to printers and portable media, and communication routes to other electronic systems. PACS

are usually based on DICOM standards.(4)Health Level Seven (HL7): An electronic communication standard for health care applications that facilitates clear communication in the health care community through an agreed upon format or protocol for electronic data exchange.(4)

II. MATERIALS AND METHODS

Overview of study design: ProspectiveStudy Setting: Southern Philippines Medical Center – a government–owned tertiary hospital in Davao City. The study will be done over a period of two months (January 2013 to April 2013)

Study Participants

All non-radiological imaging physicians connected to Southern Philippines Medical Center, whether they are consultants and residents alike are qualified to join in the study. A total of 247 consultants and resident physicians serve the SPMC as of 2012. Of these physicians, a total of 222 are non-radiological imaging physicians.

Baseline Data Collection

A questionnaire will be devised with the assistance of the hospital Quality Assurance and Quality Control section. It used a combination of responses to statements and questions, graduated from 1 to 6. Respondents will invited to allocate a score from 1, if they thought they could not agree with the question or statement at all, to 6 if they were in complete agreement with the statement or question.

Outcome Measures

Independent variable:

Resident physician and consultants.

Dependent variable:

Points of view regarding PACS. Advantage and disadvantages of PACS as perceived by non-radiological physicians. Problems encountered by non-radiological imaging physician.

Data Handling and Analyses

Data will be summarized using descriptive statistics. The replies were collated and the responses were tabulated.

Sample Size Considerations

A total of 247 consultants and resident physicians serve the SPMC as of 2012. Of these physicians, a total of 222 are non-radiological imaging physicians. If 80% of them will consent to join the study at alpha error of 0. 05, a total of 176 non-radiological physicians will be the sample size.

ETHICAL CONSIDERATIONS

Prior to enlisting in the program, the consent of the participant must be obtained.

Ethics Review

The proponents of the study will secure an approval from the Cluster Ethics Research Committee of The Southern Philippines Medical Center prior to doing the research.

Informed Consent: Form

A written consent is obtained from the potential participants who will be invited to answer the survey questionnaire.

Informed Consent: Signatory

The signature of the participant should appear in the consent form.

Informed Consent: Witness

No witness will be required in order for the informed consent to be binding.

Informed Consent: Proxy Consent

There will be no proxy consent aside from that of the participant will be allowed.

Informed Consent: Process

Prior to signing the consent form, the potential participants are informed about the study rationale and objectives.

Informed Consent: Timing and Venue

The informed consent will be taken prior to the administration of the questionnaire. It will be done in a conference room in Southern Philippines Medical Center after office hours.

Disclosure of Study Objectives, Risks, Benefits and Procedures

The participants will be informed of the study objectives and what is expected of them. They will also be told that there are no risks involved in the study and that there will be no direct benefits to them as study participants.

Renumeration, Reimbursement and Other Benefits

No renumeration or reimbursement will be given to the participants.

Confidentiality

The researchers will not disclose the identities of the participants at any time. Only the main proponent of the study has the personal information of the participants.

Investigator's Responsibility

It is the investigator's responsibility to ensure the confidentiality of any information obtained during the research.

Specimen Handling

N/A

Voluntariness

The participants have the right to refuse to participate in the study.

Alternative Options

If participants decide not to participate in the study, their decision will be respected and will not affect their employment or their regular performance evaluation.

Privacy

Participants will not be contacted by any means after they have answered the questionnaire.

Information on Study Results

The participants will have access to their data. After the data has been analyzed, the overall results will also be made known to the participants.

Extent of Use of Study Data

At present there are no intended plans to use the data aside from the objectives stated in the protocol.

Authorship and Contributorship

The principal investigator is the main author of the study.

Conflicts of Interest

The principal investigator declares no conflict of interest.

Publication

The research may be submitted for national and/or international publication.

Funding

The main proponent of the study is using personal funds to conduct the study.

Duplicate Copy of the Informed Consent Form

A duplicate copy of the informed consent form will be provided to the participants of the study. Additional copies can be made on request.

Questions and Concerns Regarding the Study

The participants will be encouraged by the principal investigator to voice out concerns about their participation in the study.

Contact Details

The participants of the study will be provided with the cellphone number of the principal investigator. The principal investigator is also available for questions, comments and concerns about the study.

III. RESULTS

Sample Table

Questions: Number of respondents/percentages (N= 176)1. How do you rate the quality of the images on the image review workstation? (very poor- very good)1 2 3 4 5 N/A0 0 0 0 1762. how useful is it to have radiology reports on PACS? (not useful – very useful)1 2 3 4 5 N/A0 0 0 0 1763. How do you rate the quality of the images on the Image Review Workstation? (very poor – Very good)1 2 3 4 5 N/A0 0 0 0 1764. Has PACS improved your consultation? a) By helping to show patients their radiology images? (Not improved – Great improvement)b) By reducing the time spent finding images for review? (Not improved – Great improvement)c) By reducing the time spent finding radiology reports? (Not improved – Great improvement)d) By making consultations more time efficient? (Less efficient – More efficient)1 2 3 4 5 N/A0 0 0 0 1761 2 3 4 5 N/A0 0 0 0 1761 2 3 4 5 N/A0 0 0 0 1761 2 3 4 5 N/A0 0 0 0 1765 What change has PACS made to the conduct of ward rounds? a) By changing the way ward rounds are conducted? (No change – Major change)b) By making it more difficult to review images during a ward round? (More difficult – Less difficult)c) By forcing a change in the way ward rounds are conducted PACS has had an impact. (For the worse – For the better)d) By making changes in the way images are reviewed at the beginning of a ward round, the ward round itself is conducted more

efficiently. (Disagree strongly – Agree strongly)1 2 3 4 5 N/A0 0 0 0 1761 2 3 4 5 N/A0 0 0 0 1761 2 3 4 5 N/A0 0 0 0 1761 2 3 4 5 N/A0 0 0 0 1766. Has PACS caused you more or less frustrations than using film? (More frustration – Less frustration)1 2 3 4 5 N/A0 0 0 0 1767 Has PACS improved your professional life? (Made is worse – Improved it greatly)1 2 3 4 5 N/A0 0 0 0 1768 To what extent has PACS changed your working practices? (Not at all – Greatly)Please describe any significant changes to your working practices as a result of PACS. 1 2 3 4 5 N/A0 0 0 0 1769 To what extent has the introduction of PACS met your expectations? (Not at all – Greatly)1 2 3 4 5 N/A0 0 0 0 17610 Please list below the three main work related benefits/disadvantages you have encountered since the introduction of PACS11 How would you rate yourself on your level of computer literacy? (Poor-Excellent)1 2 3 4 5 N/A0 0 0 0 17612 How often do you use the PACS during rounds, clinics or hospital visits? (Never-Always)1 2 3 4 5 N/A0 0 0 0 17613 Did the hospital conducted any workshops conducted to help you learn the use of PACS viewers? (None-Highly Frequent)1 2 3 4 5 N/A0 0 0 0 17614 Please list the areas of PACS viewing operations that you feel the need to conduct workshops for better facilitation of learning. Adapted from JR Pilling. Picture archiving and communication systems: the user's view, pp 519, The British Journal of Radiology August 2003.