# The Need for a Computerised Patient - Record System for the Public Hospitals in Andhra Pradesh.

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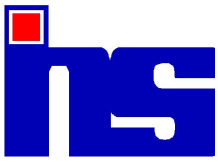

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# The Need for a Computerized Patient-Record System for the Public Hospitals in Andhra Pradesh

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## I. Introduction

The patient record is the principal repository for information concerning a patient's health care. It affects in some way, visually everyone associated with providing, receiving, or in any way related to health care services. Despite the many technological advances in health care over the past few decades, the typical patient record in the public hospitals in Andhra Pradesh, India, have virtually remained unchanged. Patient record improvement could make significant contribution to improving the health care system in the public hospitals in Andhra Pradesh.

This interest in a patient care information system has basically emerged from the belief that, it would help overcome current breakdowns and inefficiencies in patient information system and that the quality of care and inefficiencies are greatly due to reliance on paper-based records. In several cases it has also been seen that, prior medical records have been almost impossible to retrieve from the pile of existing ones and examinations as well as investigations are unnecessarily repeated. This not only results in incurring unnecessary expenditure and waste of time, but also deprives the hospitals, with limited resources, to respond to everyone's health needs. Who is to blame here? The clinicians, the hospitals or patients? The clinicians are overburned with the large volume of patients, the hospitals lack any sort of information system to deal with this problem and the patients using the public hospitals are not literate enough to preserve all the medical reports and reproduce in their next visit.

Public hospitals in Andhra Pradesh, India, constitute a major portion of the health sector. They consume a major share of the health services expenditure. Government expenditure on public hospitals accounts for about one third of the health services expenditure on public hospitals accounts for about one third of the health services expenditure (Mahapatra & Berman, 1994). Thus, improving efficiency in these public hospitals could free up resources, forother service expansion or improvements of quality and reliability of care. Within constrained resources, the government needs better/appropriate information systems to handle the volume of patients effectively and efficiently. Currently, these hospitals do not use any kind of information system to assist in their daily operations, as is common in any American

hospitals. Hence, the best step for the introduction of information system, would be towards developing a computerized patient record system in these hospitals.

I would like to propose for a computerized patient record system for the public hospitals of Andhra Pradesh. First, I would give a brief description of the organization of the public hospitals in Andhra Pradesh. Then, I would discuss the problems that these hospitals are facing due the system of paper based records. Then, I would discuss the advantages of having a computerized patient record system. Finally, I would like to highlight the problems that one would likely face, in developing such a system in Andhra Pradesh, and overcome them. I would also like to mention that there is a private sector which is quite large. The reason I have only dealt with the public hospitals relates to the disorganized state of affairs in the public hospitals and the large volume of patients that they receive. Private hospitals usually have a comparatively manageable volume of patients and have some amount of automation in place. But, it would be worthwhile to have an integrated approach, once some standards have been developed. I have discussed this aspect in the later part of this paper.

A. **The Organization of Public Hospitals in Andhra Pradesh**

Before going into further details of the need and introduction of a computerized patient record system, let me first give some light into the organizational structure of the public hospitals in Andhra Pradesh. They are basically organized in a three tier system, the tertiary level, the secondary level and the primary level.

1. ***Tertiary:*** The tertiary level hospitals are designed to provide a complete range of treatment, which include such specialties as radiotherapy, neurosurgery, thoracic surgery, plastic surgery, along with the other specialties commonly provided in all hospitals. They are usually teaching hospitals and located in the state capital as well as district headquarters.
2. ***Secondary:*** The secondary level hospitals are the intermediate level hospitals of about 100 beds, and provide medical, surgical, obstetrical, and other specialize treatments. These hospitals are otherwise referred to as the first referral hospitals, the referrals from the primary level institutions are most likely directed to them. They represent the level of care and facility in between the primary level and the tertiary care institutions.

3. ***Primary:*** These are small local (rural/community) hospitals of 20 to 100 beds, probably undifferentiated, to provide where necessary general, medical, surgical and maternity care. They are at the lowest level in the three tier system.

## II. The Present Scenario of Patient/Medical Records

At present, the condition of patient records system, in the public hospitals, is quite discouraging. The clinicians record patient information, diagnosis and treatments in paper, in a free style manner, which is called the "Case Sheet". There have been some attempts in the recent past to standardize the manual forms, but there is still a long way to go. The paper medical records remain the legal and official record of patient care. Although, some super-specialty hospitals have started using computer-generated information as part of the medical record, file folders full of slips of paper and massive file rooms are the still the norm in the public hospitals in Andhra Pradesh. I have listed below a few point to describe why it is essential for the hospitals, to switch from this system of paper records to an electronic one.

### A. High volume

There is always overcrowding in most of these hospitals, and the utilization rate is very high. This is due to the high demand of health care services and the relative dearth of health care providers and beds compared to the size of the population. Recent studies show that, there are 6 beds for every 10,000 people. This high volume of patients means high volume of medical records. Any amount of proper filing has been unable to handle the high volume of the paper.

### B. Illegibility

The information in the medical records is handwritten, especially patient's problem list, documentation of history and physical, encounter notes in outpatient's order sheets and progress notes in inpatient records. One of the drawbacks of handwritten documentation is obviously illegibility. This is less of a problem for the clinicians, who originally penned the text, but can be extremely difficult for others, who must devote extra time to the task of reading it and may end up with not getting the information they need.

**C. Non-standardization (Lack of any standard format)**

When documentation is handwritten, it tends to be free form and not necessarily complete. Because medical nomenclature is not standardized, it is difficult to ensure that the user of a medical record draws the interpretation from the documentation that the author intended. Thus, this non-standardization aspect of the paper records adds confusion and may lead to lower standard of clinical care or repeated investigations.

**D. Duplication of records**

If a patient has to visit more than one department in the same hospital, hen separate records are created for him/her n the individual departments. Medical records are typically maintained in each care setting. This is done to avoid any chance of losing the record, because of its moving and more duplication of laboratory investigations. This causes unnecessary costs. Patients who obtain care in multiple hospitals, have fragmented, partial documentation of their medical history in a number of different records.

**E. Delay in retrieving records**

Currently, hospitals have elaborate processes in place to pull medical records and make them available to the locations where physicians and providers need the information. Due to the difficulty in locating, a lot of time is wasted and most of the times the patients end up being seen without a medical record.

**F. Missing records**

As a result of all of the above mentioned reasons, one often sees a high rate of missing records. One consequence of missing information is repeated diagnostic tests and procedure. Another consequence is unnecessary delay in inpatient or ambulatory care and treatment. Another consequence is unnecessary delay in inpatient or ambulatory care and treatment. Sometimes it may turn out too costly, and may cost patients' lives.

**G. Inability on part of patients to preserve medical reports**

Most of the patients visiting the public hospitals in Andhra Pradesh, are poor and usually illiterate. They cannot be expected to understand the handwritten papers and preserve them. So, it becomes difficult on the part of the providers to rely on these patients for their medical history/records. Primarily, the hospitals and the providers tend to be responsible for

the medical history/records of these patients. But, the lack of any proper patient record system in these hospitals results in a lot of frustrations to everyone involved in the process.

## III. The Need for a Computerized Patient Record System

All the points discussed above, strongly argue for the necessity of a computerized patient record system for the public hospitals in Andhra Pradesh. Clinical information systems were considered a helpful luxury a few years ago, but today they have become an urgent necessity. The health care delivery system is changing, and today's health care facilities need to share integrated patient information within their own environments as well as across providers. The real question is how are the hospitals going to benefit for this system. Apart from overcoming the various problems that have been discussed above, let me now point out the advantages that a computerized patient record system will have over a paper based one.

### A. Improve efficiency

The most important function of a CPR is increased efficiency, both from the cost and the clinical care perspective. The efficiency can be increased by reducing costs and improving staff productivity, which can in turn be achieved by avoiding duplications, repetitions, delays, missing records and confusions.

### B. Improve Health Care Delivery

It can lead to improved health care delivery by providing medical personnel with better data access, faster data retrieval, higher quality data and more versatility in data display. The ease and speed of obtaining information is one obvious advantage. Some studies have found enhanced care and improved outcomes of care for patients and a reduction in medication errors with the introduction of CPR (Rogers et al., 1982, Garret et al., 1986).

### C. Quality Assurance/Quality Improvement

Automated patient records can also make quality assurance activities possible in the individual hospitals, departments. The clinical data that is captured electronically could be later used for evaluation for quality assurance, quality improvement, examinations of variations in care and studies on utilization and outcomes.

### D. Measure Physician/Hospital performance

Another possible advantage of CPR is making hospital's as well as clinician's performance measurable and comparable (by risk adjustment of course). This will enable the clinicians to rectify any possible problems relating to care. With the Consumer Protection Act. Which started being applicable to health care since September 1995, there will be a necessity for hospitals, as well as the providers to have a documentation of their treatment and advice.

**E. Can be used as a teaching/research tool**

CPR can support health service research and accommodate future developments in health care technology, policy, research, finance etc. Health care professional schools and organizations could enhance educational programs for students and practitioners in the use of computers, CPR's, and CPR systems for patient care, education and research. They could make medical knowledge more accessible for use by practitioners when needed. CPR could also support information management and independent learning by health care students and professionals in both patient care and clinical research settings. Tools for such learning include clinical decision support systems, bibliographic and knowledge links, and statistical software.

**F. Force orderliness and standardization**

Studies show that the accuracy and completeness of the data in the medical records have improved after the introduction of computerized patient record system (Metzer,..). Further, it is also possible to program the entry in such a manner so that it would be necessary to fill in all the required places. This would force some kind of standardization, where the integration of patient data would be possible. Many problems that providers face due to non-standardization, would be overcome by introduction of CPR.

**G. Increase accountability**

CPR would also make providers more responsible and accountable for their actions. I would assume that the number of adverse events linked to physician's irresponsibility would definitely come down. Increased accountability would also help the providers more efficient both from the cost as well as the clinical care perspective.

**H. Managerial tool**

Finally, CPR could also be used as a managerial tool to provide total, cost-effective access to more complete, accurate patient care data and to offer improved performance and

enhanced functions that can be used to meet those information management challenges. They can play an important role in improving the quality of patient care and strengthening the scientific basis of clinical practice; they can also contribute to the management and moderation of the health care costs.

## IV. Areas of Caution

While introducing CPR, one has to keep in mind that merely automating the form, content, and procedures of the existing patient records will perpetuate their deficiencies and will be insufficient to meet user needs. So, an in-depth analysis and needs assessment of the potential users is necessary before the introduction of the CPR. Depending on the requirement of the users, the CPR may be designed with special features to cater to their needs. CPR should offer enhanced communications capabilities and must be able to transmit detailed records reliably across substantial distances.

If users are to derive maximum benefits from CPR system, they must fulfill four conditions. First, users must have confidence in the data, which implies that the individual who collects data must be able to enter them directly into the system and that the system must be able to reliably integrate data from all sources and accurately retrieve them whenever necessary. Second, they must use the records actively in the clinical process. Third, they must understand that the record is a resource for use beyond direct patient care. Fourth, they must be proficient in the use of future computer-based record systems and the tools that such systems provide (e.g., links to bibliographic databases or clinical decision support systems).

Further, I would recommend that before the implementation of any CPR, some activities that are very critical to CPR development, should be undertaken. They are, proper identification and understanding of the CPR design requirements, development of standards, CPR and CPR systems research and development, demonstrations of effectiveness, costs and benefits of the CPR system, coordination of resources and support for CPR development, diffusion, education and training of developers and users.

## V. Obstacles to Overcome

### A. Absence of any system of Unique ID

One major problem in the introduction of CPR in Andhra Prades, would be identification of patients. There is no system of social security numbers or any other identification numbers. Further, there are a few similar names that many people have. So, it would be very difficult to have a database of similar names and no other Ids. One way to overcome this problem is to have their parents as well as their village names in the database. This would differentiate the individuals with similar names. The database could be developed, having this problem in mind. Currently, the government of Andhra Pradesh is developing the system of social security identification numbers. So, this problem will be dealt with effectively.

**B. Acceptability by the Providers**

One major barrier to the introduction of CPR is the acceptability by the providers in the hospitals. Sometimes, there are providers who are eager to learn new things, while there are some who would object to any change in their lifestyle, especially one that would require interactions with a computer. They may feel threatened by the consequences of the CPR. Here, it is crucial that, some good leadership figures are identified, who would become champions and positive role models in the use of CPR.

**C. Postal Addresses**

It is very likely that many poor people do not have any postal address. They either live in temporary houses or share houses. Sometimes, they would build a thatched house beside a railway station or a bus stand, then they would pack up and find another convenient place. So, it is very difficult to track these people. The health care delivery system would be missing a big chunk of the population, if it does not have any system of having them in the database. Some system has to be worked out to identify these people when they come in frequently to the hospitals.

**D. Multiple Languages**

A big problem one faces in any part of India, is the use of multiple languages. In Andhra Pradesh, people speak several languages. Some of them are Telegu, Urdu, Hindi and English. So, which language should the CPR use ? If it uses Telegu, then many people do not know how to read and write it. Similar is the case with the other languages. So, I feel that this may pose a major problem, unless there is a built in translator in the program. English is also a good alternative, as most PC users know English.

**E. Cost Component**

One important influencing factor, whether the public hospitals would adopt CPR, is the size of investment required on the part of the government. Acquisition costs for CPR are substantial, but are difficult to estimate, because, the purchase of a system does not reflect the total implementation cost. It excludes the cost of training, potential losses of productivity during transition to the system and previous level of automation/computerization. One cost analysis of the implementation of CPR (ambulatory care) found that the cost per patient encounter of a computer based system was 26% greater than the direct costs associated with operation of a manual system (Koster et al., 1987).

I would urge that an international funding agency be requested to aid in this kind of an innovative approach to health care delivery.

**F. Maintenance of computers in rural areas**

As I have mentioned before, the primary hospitals, which are the lowest in the three tier system are located in the rural areas of Andhra Pradesh. It may be extremely difficult to automate these hospitals. Should they be excluded from the CPR system or should there be some way to deal with these hospitals ? My suggestions are to first conduct a study, where we collect data about the capacity and utilization of such hospitals. Then, it will be possible to get some idea as to how much investment is necessary to include these hospitals in the system and how much do we lose by excluding them. Any new system should not be over ambitious from the beginning.

**G. Uninterrupted Power Supply**

One of the minimum requirements of a CPR system is uninterrupted electrical power supply. A major problem in most of the states in India is the frequent breakdown of power supply. Most hospitals have some sorts of alternative power supply systems, to handle cases during these breakdowns. It would be advisable to, either have better Uninterrupted Power Supply (UPS) system, or upgrade the existing system, if they are good enough to support the CPR system.

**H. Dearth of Trained Personnel**

A CPR system would require a good number of trained personnel for development, implementation and finally maintenance of the whole system. At present, there may not be

adequate professionals in this field. But, once people come to know that there are opportunities in this area, many would opt to be trained in order to get employment in the hospitals. I recommend that such courses be introduced in colleges as subjects, so that there would not be any dearth of trained personnel, in a few years to come.

**I. Confidentiality**

The issue of confidentiality is substantial, but not a big, as it is in the Western societies. To me, this is more of a cultural issue. India is a collective society, and privacy is not so much of a big issue. There are much more grave and competing issues to be attended to than this one. This does not imply that one should not make any attempts toward protecting patients security, during the development of a CPR system. I personally feel that some standards should define the limits and scope of privacy and confidentiality for sensitive data (abortions, AIDS, psychiatric problems, drug use or alcohol problems) in clinical information of the CPR systems. However, any amount/level of sophistication is never enough to deal with the social deviants. So, one should realize the tradeoff between efficiency, effectiveness and privacy of patients.

**J.Standardization**

There would be a need to develop guidelines, in order to standardize the clinical practices. At present, there is no standardized format or clinical guidelines that are existing to aid in the development of the CPR. Some attempts have been done by the Commissionerate of Medical Services in 1989. Major steps towards standardization is essential for a successful CPR. There should be no confusion regarding what should be entered to convey what. All records need to be accurate, accessible, authenticated, organized, confidential, secure and complete.

## VI. Summary and Conclusion

The promise offered by fully computer-based patient records for improving quality of care and advancing medical knowledge is enormous. Therefore consorted efforts should be made to overcome the technological and the non-technological barriers that stand in the way of full development of computer-based records system.

One needs to recognize that considerable work needs to be accomplished and practical difficulties resolved before CPR become the standard mode of documenting and

communicating patient information and before they are perceived and used as vital resource for improving patient care. The challenge of coordinating CPR development efforts in a pluralistic health environment, as in Andhra Pradesh, is great. Further, achieving maximum benefit from CPR systems will require that they linked to an information infrastructure (e.g. Network) that allows patient data, medical knowledge, and other information to be transmitted and accessed when and where needed, subject to appropriate confidentiality and security. The desire to improve the quality of and access to patient data should be shared by patients, practitioners, administration, researchers and policy makers in the state of Andhra Pradesh. The CPR, at present, is an essential technology for health care, to be adopted by the public hospitals in Andhra Pradesh. The following recommendations would help in making the whole process possible:

1. The public and the private sector should collaborate and establish a committee to promote and facilitate development, implementation, and dissemination of the CPR.
2. Cost analysis studies should be conducted to understand the feasibility of a statewide CPR system.
3. They should develop and promulgate uniform state level standards to facilitate implementation of the CPR. A variety of standards need to be developed, tested, and implemented before the CPR can realize its full potential at all levels.
4. There should be a survey for the demand for such a system. The full cost of implementing and operating a CPR may be shared by those by those who benefit from them.
5. Health care professional schools and organizations in Andhra Pradesh, should enhance their educational programs for students and practitioners in the use of computers, CPR, and CPR systems for patient care, education and research.
6. The committee should work out and develop a system of identification numbers for the patients, that would be used by the CPR system.

If appropriate steps are taken before the development of a computer-based patient record system, I am sure that the whole process would be a success and ease a lot of problems that clinicians currently face in public hospital settings.

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