# ICT IN PHARMACEUTICAL CARE

**Prof. BRINDA SREELESH**
Asso. Professor,
NCRD's STERLING INSTITUTE OF PHARMACY, Nerul, Navi Mumbai:

**SAKINA IQBAL H. BIKANERI**
Student, NCRD's STERLING INSTITUTE OF PHARMACY,
Nerul, Navi Mumbai:

sakina3102@gmail.com

## ABSTRACT:

*In today's healthcare environment, demands with respect to quality, security and efficiency are continually increasing. These demands, together with a growing and rapidly ageing population, challenge healthcare systems. ICT is a term frequently used to label technological systems and applications that are designed to manage and communicate information in healthcare settings which can help to overcome these challenges Reaching beyond real-time claims adjudication, ICT creates value for pharmacies and opportunities for pharmacists to use their professional skills in innovative ways in today's evolving value-based care systems. Electronic prescription (EP) services have made the dispensing and reimbursement processes more efficient. ICT can enable the storage of structured patient records thus ease in patient diagnosis and can also help in comparing the diagnosis results among the patients. ICT can, automate the handling of medicines in the supply chain and provide tools for monitoring the efficacy and safety of medicines in use. ICT can therefore improve patient safety, enable professionals to provide high quality care and help patients make the most of their medicines .In the field of pharmaceutical sciences, ICTs can further enhance the qualities of services provided by community pharmacist to indoor and outdoor patients. As lots of modifications and newer drugs are coming in the market, it is quite a challenging task to a pharmacist to update knowledge to serve the society in an efficient way. ICTs can be utilized in health care sector to improve quality of patient centric services.*

***Keywords:*** *Challenges, technology, healthcare, pharmacists, patients*

## INTRODUCTION

The use of communication technology has brought positive changes to the healthcare delivery system of today. Both healthcare professionals and patients have found a better option to access relevant health and drug information. Ideally healthcare providers should make use of the latest technology in patient care to improve their services and to evade

human errors. In pharmaceutical care, the uses of new technologies to reduce the number and severity of medication errors have been endorsed and in some cases, mandated. During last 40 years, information and communication technologies have major impact on the health care services for patients. Automated information processing has an advantage, hence most of countries are using computer technology. Properly used technology can enhance data collection, manage information and, ideally improve the overall quality of patient care.

## WHAT IS PHARMACEUTICAL CARE?

Pharmaceutical care involves process through which a pharmacist cooperates with the patient and other professionals in designing, implementing and monitoring a therapeutic plan that will produce specific therapeutic outcomes for the patients.

Basic elements of Pharmaceutical care are:

1. Patient oriented.
2. Stress on prevention of drug related problems.
3. Documented systems on patients record need and care.
4. Emphasis on optimizing patient's health quality of life.
5. Offering continuous care in a systemic way.

The outcomes of Pharmaceutical care are:

1. Cure of a disease.
2. Elimination or reduction of patient's symptomology.
3. Arresting or slowing of a disease process; Preventing a disease or symptom.

## IMPACT OF ICT IN PHARMACEUTICAL CARE:

### Electronic medical records (EMRs):

An EMR is the legal patient record that is created in digital format in hospitals and ambulatory environments. EMRs may include a variety of personal and clinical information.

This computerized system works by sending the clinical information into the healthcare provider's inbox on each visit of the patient and thus allowing the complete examination of patient records in less time. Appointments and test requests are also clearly listed in the EMR, which benefits both clinicians and patients. The system can be programmed to provide

reminders for disease management, annual screenings, or required immunizations. Finally, the system can provide accurate and rapid billing and collection of information. EMR helps to scale back medical errors by utilizing computerized prescription entry, predicting drug interactions and displaying a warning for the health-care supplier, aiding clinicians in accommodative patient medications, and most important, maintaining a detailed and legible medical record. EMR databases may serve as a big asset of research since detailed clinical information of a huge sum of population is available for investigations.

EMRs have been slow to develop, but there is considerable promise that automated records would be more complete and accurate, and would enable much more accurate diagnosis and reduce costly medical errors.

According to a study by Klienke (1998) he saw the electronic medical record as the essential technology. The NHIMAC (2001) suggested that: *Latest computer hardware and software are now used for storage, sharing and use of health knowledge for communication to common masses by health care service provider. By sharing health information using information and communication technologies, lifestyle of peoples can be improved.* [1] [2]

Various studies were designed on quality and safety outcomes of health information and technology based on a triangle model. This model is based on identification of structure-level predictors, including the technology itself; the health care service provider; and the patients. It specifies the variables to be estimated in the study and include both qualitative and quantitative analysis of data. Impact of health information technology on quality, efficiency and cost of health care services are specifically studied. As per survey in 2010, 14% of community pharmacies are using inpatient computerized order entry, having decision support system. Health care professionals can update their knowledge and can contribute to the welfare of society. The field of pharmaceutical sciences can be further improved by using health information and technology. Patients may be cared efficiently and medicine information can be provided efficiently. [3]

## Electronic prescribing systems (EPS):

EPS makes it possible for your prescriptions to be sent electronically to the pharmacy or dispenser of your choice. This means you'll no longer have to collect a paper repeat prescription from your GP practice – instead, you can go straight to the nominated pharmacy or dispensing appliance contractor to pick up your medicines or medical appliances.

There are a number of local and national initiatives being developed to address these issues, such as the NHS Connecting for Health Electronic Discharge Implementation Toolkit with standard discharge headings, schemes such as the East Lancashire "Refer to pharmacy" system, designed to ensure that community pharmacists are in the discharge communication process and the Royal Pharmaceutical Society's standard pharmaceutical care record program. [4]

EP systems were pioneered within the United States of America within the early Nineteen Nineties, however there area unit still comparatively few hospitals within the kingdom with whole-hospital EP systems. Timely and correct transmission of a patient's discharge prescription from secondary to medical aid is very important to make sure seamless patient care, and conjointly to stop errors arising from miscommunications. Electronic prescribing promises for cost savings, greater efficiency and improved healthcare outcomes. Electronic prescribing (EP) systems automatically prescribe, supply and help administration of medicines in hospitals, where they have been shown to reduce medication errors and have a major impact on patient safety. However, the result on error reduction relies on system style and poorly enforced system will truly increase error rates.

## Telecare:

The use of online technologies for direct provision of health care presents exciting opportunities to increase consumer and provider access to a range of health services, particularly for those living in remote and rural communities. The emergence of internet based technologies and distributed systems, together with business integration and improvement, are increasingly seeing the merging of telehealth with mainstream health care delivery. Online communication between patients and their doctors tends to be resisted by doctors, concerned about the time it will take and whether that time can be billed; but driven by patients, who would like a more flexible relationship. It involves the use of digital communications technology (audio and visual) to provide healthcare consultations and services to patients remotely at home. Telecare has numerous potential benefits: it puts patients at the centre of their care and supports individualized medicine; it improves access by reducing the requirement for hospital attendance (for individuals with poor quality, or those in remote areas); and it can reduce the travelling times and costs of healthcare professionals. However, the exact benefits provided by telecare vary between different

applications and care scenarios, and, at present, the literature suggests that more evidence of outcome benefits, and more cost-effectiveness data area unit needed to justify additional investment in telecare.

This system provide care to old and handicap patients and supports them in their medication. Due to telecare services pediatric and geriatric patients may have efficient healthcare services and decreases their inconvenience of attending hospital. In pharmacy, use of remote consultations, together with EPS and an internet pharmacy supply service, could transform the way that pharmacy services are provided. However, adoption of telecare in pharmacy would be addicted to the provision of reliable communications and integration architectures, the willingness of pharmacy operators to invest in these and also a vital mass of domestic use of digital technologies all told patient demographics.

Benefits of tele-care include:

1. Increased access to appropriate health services for both providers and consumers in regional and remote areas.
2. Reduced time away from work and home for health consumers living in regional and rural area.
3. More efficient delivery of health services through reduced delays and costs relating to patient transfers.

A study to provide a proof of an innovative approach to pharmacovigilance conducted in Nigeria by Adedeji et al.Purchase of medicines was actively monitored for 28 days in three community pharmacies and four patents and proprietary medicine store (PPMS) in the community. Information on an experience of ADR was obtained by telephone from 100 volunteers who purchased anti-malarial drug during the 28-days period. Out of the total drugs purchased, 12.4% were completed courses of anti-malaria. Response to mobile phone monitoring of ADR was 57% in the first 24h after purchase and decreased to 33% by day 4. A member of the research team responded to inquiries by phone from patients and categorized the complaint as an adverse drug reaction (ADR). [5]

The use of mobile telephones is widespread in society. Some pharmacies are using text alerts to remind patients that repeat prescriptions are ready or to offer services, but sophisticated apps have been developed for disease monitoring, for example, recording of peak flow readings in asthma, monitoring of blood glucose levels, medication adherence support and health education. These apps will have a greater impact on pharmacy practice in future.

A mobile pharmacy service system (MPSS) was developed to deliver individualized pharmaceutical care via text messages. The MPSS is an SMS-base system that can run on a computer and facilitate pharmaceutical care by sending mobile phone text message to patients. The text messages were: reminders about their medication, practical information about medicines (such as information about method of administration), and information about adverse drug reactions**.** [6] In a three-month trial in a general hospital in China, 100 patients were provided with pharmaceutical care using the MPSS for an average of 3.5 medicines per patient for 12 days each. A survey was then conducted which found that most patients were satisfied with the pharmaceutical care provided by MPSS through text message. Similarly, in a randomized control trial, Pop-Eleches et al, tested the efficiency of short message service (SMS) reminders on adherence to antiretroviral therapy (ART) among patients attending a rural clinic in Kenya. Four hundred and thirty-one adult patients who had initiated ART within three months were enrolled and randomly assigned to a control or one of the four intervention groups. Patients in the intervention groups received SMS reminder that were either short or long and sent at daily or weekly frequency. Adherence was measured using the medication event monitoring system (MEMS). [7] [8]

## ADHERENCE MONITORING:

In drugs, compliance (also adherence, capacitance) describes the degree to that a patient properly follows medical recommendation. Most commonly, it refers to medication or drug compliance, but it can also apply to other situations such as medical device use, self care, self-directed exercises, or therapy sessions. Various technologies are now available to support approaches to adherence monitoring. A number of vendors have developed "smart" packaging, wherever a microchip-containing pill wadding is ready to watch once doses are popped out (not essentially taken) and prompt the patient to record side-effect observance data for the medication in question.

Adherence was measured using the medication event monitoring system (MEMS).

The participants received a new medication in the MEMS bottle. MEMS adherence was calculated as the number of actual bottle openings divided by the number of prescribed bottled openings for the period. Because all patients were prescribed twice-daily, the maximum number of the opening was set to be equal to two so that MEMS adherence was not inflated by extra cap openings. The primary outcome was whether or not adherence

exceeded ninetieth throughout every 12-week amount of study and therefore the 48-week study amount. [7] [8]

A more invasive adherence monitoring technology is the "smart" pill, for example, the Lifenote system, piloted by Lloyd's pharmacy. This consists of a detector pill, ingested by the patient, which transmits data on doses taken, heart rate and body posture to a mobile telephone or tablet device, via a receiver patch on the patient's skin. At present, this is often on the market solely as a dummy pill, however eventually it'll be incorporated into medicines. [9] [10]

## CONCLUSION:

Health information and technologies involve information processing using various software. Software play an important role in pharmaceutical care for storage, accessibility, sharing the information by community pharmacies, Electronic prescribing have made the dispensing and reimbursement processes more efficient. Maintenance of patient record becomes easy for pharmacists in providing patient centric services. Telecare services use digital communication technology to provide consultations and other health care services to rural and suburban patients. Thus internet access and availability of ICT is important to provide information to health care professionals, patient's community pharmacists and all the stake holders. From this review, we can conclude that work is at the primitive level and with confluence of ICT, Pharmaceutical care will reach its pinnacle.

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