International Journal of Pharmaceutical Science and Research
ISSN: 2455-4685; Impact Factor: RJIF 5.28
Received: 23-11-2018; Accepted: 27-12-2018
www.pharmacyjournal.net
Volume 4; Issue 1; January 2019; Page No. 39-52

The pharmacists in ambulatory care

AK Mohiuddin
Assistant Professor, Department of Pharmacy, World University of Bangladesh, Bangladesh

Abstract
Ambulatory care pharmacy practice is defined as the provision of integrated, accessible healthcare services by pharmacists who are accountable for addressing medication needs, developing sustained partnerships with patients, and practicing in the context of family and community. This is accomplished through direct patient care and medication management for ambulatory patients, long-term relationships, coordination of care, patient advocacy, wellness and health promotion, triage and referral, and patient education and self-management. The ambulatory care pharmacists may work in both an institutional and community-based clinic involved in direct care of a diverse patient population.
A variety of specialty clinics are available for allergy and immunology, pulmonology, endocrinology, cardiology, nephrology, neurology, behavioral health, and infectious disease. Such services for this population may exist as a primary care clinic or an independent specialty clinic, typically in a PCMH, which is instrumental in coordinating care between various providers. Once a practice site is identified, it is important to establish a strong, trusting, and mutually beneficial relationship with the various decision-makers (e.g., administrators, providers) involved with the clinic. If pharmacy services are currently in existence, the pharmacy director may be able to identify and initially contact the appropriate person. If another pharmacist is providing clinical services, this person would be a resource to help determine areas for expansion of patient care and to whom to direct the proposed business plan. Additional individuals to consider as an initial point of contact include the clinic manager, clinic medical director, or administrative assistant to either of these persons. If the clinic setting is affiliated with a medical school, it may be necessary to contact the Department of Family Medicine head.

Keywords: community pharmacist, provider, medication, outpatient, care

1. Introduction
Ambulatory refers to patients not occupying beds in hospitals or other inpatient settings. Ambulatory patients are non-institutionalized patients who have the responsibility for obtaining their medication, storing it, and taking it. They may or may not be outpatients, depending upon where they receive their treatment. They may even be in a wheelchair and, strictly speaking, not ambulatory, but if they are not institutionalized, they will have the same basic responsibility for their medication as walking patients. Various designations are used to categorize patients: institutionalized, non-institutionalized, inpatient, outpatient, bedridden, and ambulatory. Ambulatory patients may be inpatients of an institution, such as a hospital or extended-care facility, if they are not confined to bed. However, the term ambulatory patient has become more restrictive in its modern usage simply to mean a non-institutionalized patient. Whether patients consult a physician who may prescribe medication or whether they decide to treat themselves, the community pharmacist more than likely will come into contact with them. It is important, therefore, for the pharmacist to have an understanding of these patients so that as a pharmacist and member of the health-care team, the best possible health care for ambulatory patients may be provided through proper use of knowledge and judgment.

1.1 Purpose of the study
Discussion and projection of pharmacists' roles and responsibilities in ambulatory care settings.

1.2 Methodology
The research is conducted through secondary data search from several sources from books, technical newsletters, newspapers, journals, and many other sources. The present study was started from the beginning of 2018. PubMed, ALTAVISTA, Embase, Scopus, Web of Science, and the Cochrane Central Register of was thoroughly searched. The keywords were used to search for different publishers' journals like Elsevier, Springer, Willey Online Library, Wolters Kluwer were extensively followed.

1.3 Findings
Ambulatory Care Pharmacy addresses the provision of integrated, accessible healthcare services of ambulatory patients transitioning from the hospital to home or another care facility. Given the focus on ambulatory care as an option for health system renewal, it is important to evaluate the provision of home care services to ensure that care is optimized and meets patient needs.

1.4 Limitation of the study
There are too many information available regarding ambulatory pharmacists' roles and responsibilities, superiorities in healthcare arena among others in healthcare profession. Information only available from reputed journals are added here.

1.5 Practical Implication
Students, researchers and professionals of different background and disciplines pharmacists, doctors, nurses and health regulatory authorities have to acquire much from this article.

Fig 1: Ambulatory/Outpatient Care Center

Ambulatory care or outpatient care is medical care provided on an outpatient basis, including diagnosis, observation, consultation, treatment, intervention, and rehabilitation services. This care can include advanced medical technology and procedures even when provided outside of hospitals.

Fig 2: Primary and Ambulatory Care Experience Pictogram.

Most of the patients referred to the Complex Care Clinic have seen multiple physicians, are taking multiple medications, and are at risk of clinical deterioration and admission to hospital. The clinic's inter professional team consists of internal medicine physicians and residents, pharmacists, social workers, occupational therapists, physiotherapists, respiratory therapists, a nurse, and a home care case coordinator. The team partners with patients to develop comprehensive care plans that support self-management. Patient referrals may entail a one-time consultation or, more commonly, coordinated care on an ongoing basis (Source: Practice spotlight: pharmacists in a centre for ambulatory care education. Can J Hosp Pharm. 2012; 65(4):317-8).

1.6 Scope of Ambulatory care Practice

Healthcare reform has created a demand for change in the delivery of healthcare services. Encouraging the introduction of the medication expert in providing patient-centered care is an important element in the advancement of delivering quality clinical services. The ambulatory setting is where most individuals in the US receive health care [1]. Consequently, ambulatory care is a growing field of pharmacy practice. Employment of registered pharmacists is projected to rise dramatically in physician offices and medical center outpatient clinics within next 10 years. The literature also supports the positive effects of pharmacy practice in ambulatory care settings, such as decreased benzodiazepine use, improved anxiety scores, improved cardiac outcomes, and improved compliance [2]. Healthcare payment reform will have far-reaching effects on health-system behavior, including a shift of resources from inpatient care to ambulatory care. Health systems will give renewed attention—well beyond lip service—to classical public health initiatives (i.e., disease prevention and health promotion). They have higher expectations for leadership by pharmacists on a broad array of medication-use issues that affect institutional success. Given the focus on ambulatory care as an option for health system renewal, it is important to evaluate the provision of home care services to ensure that care is optimized and meets patient needs. A nearly 85% affirmative response obtained that nearly all health systems will have strong financial incentives to keep their patients healthy and not in need of high-cost healthcare services, particularly inpatient care, reinforces the importance of keeping "at-risk" populations healthy. A major implication of this prediction is that health-system pharmacy must embrace ambulatory care [3]. Pharmacy Forecast 2016–2020, published by the American Society of Health-System Pharmacists Research and Education Foundation, predicts that health care payment reform will result in a significant shift of health-system resources from inpatient to ambulatory care. Health care delivery and financing will move assertively to expand pharmacist services in ambulatory-care clinics [4, 5]. The forecast is the fourth annual report the foundation has produced for hospital and health-system pharmacists. Other highlighted topics include:

- The need to optimize the deployment of pharmacy talent.
- An emerging oversupply in some regions of pharmacists for entry-level positions.
- New tools to measure and improve pharmacist and departmental performance.
- Continuing attention to "meaningful-use" requirements for information technology.
- Implications of the patient empowerment movement for pharmacies [6].

Optimizing pharmacy workforces over the next five years will involve placing greater emphasis on ambulatory care. Three-fourths of the forecast panelists believe that at least a quarter of health systems will require patient-care pharmacists to be responsible for both inpatients and outpatients. Also, at least a quarter of health systems are expected to shift 10% or more of their inpatient pharmacy positions to ambulatory-care positions. This shift towards ambulatory care is expected to result in a vacancy rate of at least 10% for ambulatory-care pharmacy leadership positions [7].

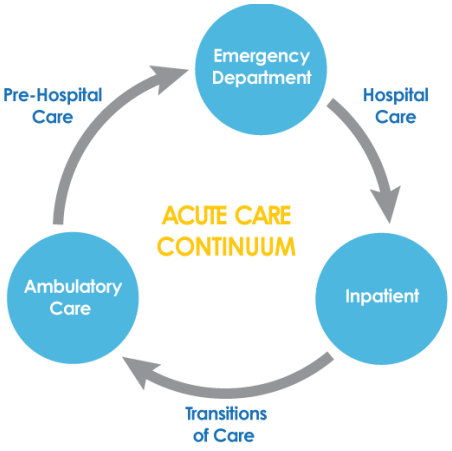

Fig 3: The continuum of acute care delivery in the US

Multidisciplinary, policy-relevant, health services research of acute-care utilization, quality, effectiveness, and outcomes requires consideration of how the healthcare delivery dynamics within one setting impact the care delivered in subsequent settings. "Seamless care" is a smooth and safe transition of a patient from the hospital to the home. Optimizing delivery of care at stages of transitions has been a prominent focus of healthcare reform. The delay and limited transfer of information on patients' medical histories from outpatient providers to the acute care setting can lead to omitted and/or redundant evaluations, which can result in increased length of stay and increased risk of morbidity and mortality (Web Acute care Research Unit, University of Michigan)

1.7 Pharmacists in Ambulatory care

All people who take medications are at risk of actual or potential drug therapy problems. These problems are a significant source of morbidity and mortality when left undetected and unresolved and drive huge costs across the health system. As drug therapy experts, pharmacists provide drug therapy management services built around a partnership between the pharmacist, the patient (or his or her caregiver), physicians and other members of a patient's health care team. As ambulatory care pharmacy practice grows, there has been an ongoing effort to identify the desired role of the staff pharmacists in outpatient care and to provide linkages to preferred outcomes. In at least 25% of health systems, patient care pharmacists will have umbrella responsibilities, encompassing both inpatients and outpatients, for pursuing the best outcomes from drug therapy [4]. Their vision is to be a reliably standard setting in its provision of direct patient care and to continuously develop methods that improve this practice. They facilitate safe, effective, efficient and economical use of medications with the aim of optimizing patient care by qualified and trained staff. Pharmacists play an essential role in the safe, quality and effective use of medications in improving patient's physical and mental wellness [8]. They are instrumental in managing medication-related issues to complement the holistic care for patients throughout the organization. Pharmacists provide education to patients and caregivers on the safe and appropriate use of medications, counsel on medication compliance, monitor and manage medication side effects, as well as screen for dangerous drug interactions [9]. In addition, they specialize in recommending optimal medication therapy for concurrent medical problems, with the aim of enhancing treatment outcomes and facilitating the continuity of care as patients integrate back into the community [10-14].

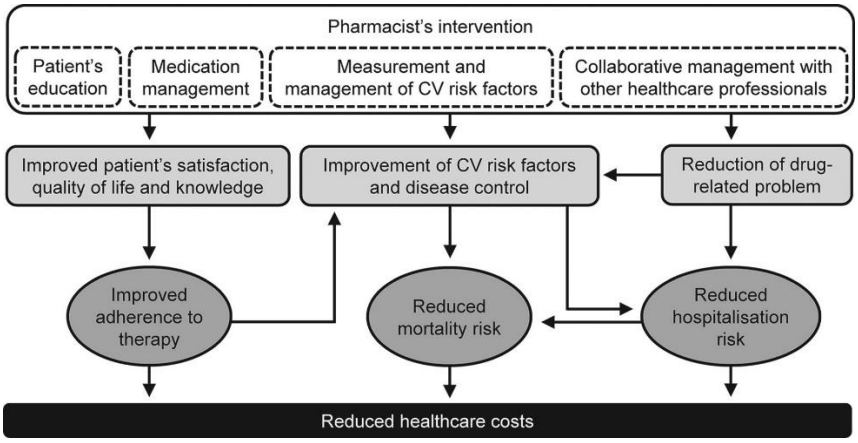

Fig 4: Benefits of pharmacist's intervention

Because of their accessibility, pharmacists are in a distinct position to provide appropriate interaction and/or collaboration with patients and physicians to ensure successful treatment. Pharmacist involvement from screening patients right up to initiation of therapy and follow-up had proved to be essential in achieving positive outcomes in most but not all patients with cardiovascular risk factors or diseases. Interventions provided by pharmacists are in general beneficial in the management of major cardiovascular risk factors such as hypertension, dyslipidaemia, diabetes or smoking cessation, and in heart failure, with a positive effect on clinical outcomes. The net effect of the pharmacist's intervention is the use of fewer healthcare resources and cost saving, although this evidence still needs to be confirmed in large intervention trials (Source: Omboni S, Caserini M. Effectiveness of pharmacist's intervention in the management of cardiovascular diseases. Open Heart 2018; 5:e000687. doi: 10.1136/openhrt-2017-000687)

2. Expertise in Therapy Management

The goal of pharmacy service is to identify and resolve actual or potential drug therapy problems for patients and to promote the safe and effective use of medications and enable patients to achieve positive, targeted therapy outcomes. The medication management framework includes the following:

2.1 Assessment

The pharmacist assesses each patient through observation, dialogue and consideration of clinical indicators. Medication counselling opportunities are key times for pharmacists and patients to discuss medications and patients' concerns about their therapy. Communication Accommodation Theory (CAT) describes behavioral, motivational and emotional processes underlying communication exchanges. Five CAT strategies (approximation, interpretability, discourse management, emotional expression and interpersonal control) permit identification of effective communication. In most European countries, feedback is embedded in education, training and daily professional activities. It is a valuable tool for indicating whether things are going in the right direction or whether redirection is required. Treatment alternatives are assessed for appropriateness, effectiveness and safety (including interactions), to prevent and resolve medication-related problems [15-17].

2.2 Care plans

The pharmacist creates a plan in consultation with the patient and, when necessary, other members of the health care team. The care plan includes goals and actions to achieve the patient's personal health goals through optimal drug therapy. Patient participation means involvement of the patient in decision making or expressing opinions about different treatment methods, which includes sharing information, feelings and signs and accepting health team instructions [18]. Actions include patient and/or caregiver education about chronic disease, writing a prescription to continue care, initiating new treatment and disease prevention such as immunization and lifestyle modification programs. There is a huge opportunity for pharmacists to have a significant impact on reducing healthcare costs, as they have the expertise to detect, resolve, and prevent medication errors and medication-related problems [19]. Care plans also include medication support systems such as compliance packaging and medication reminders.

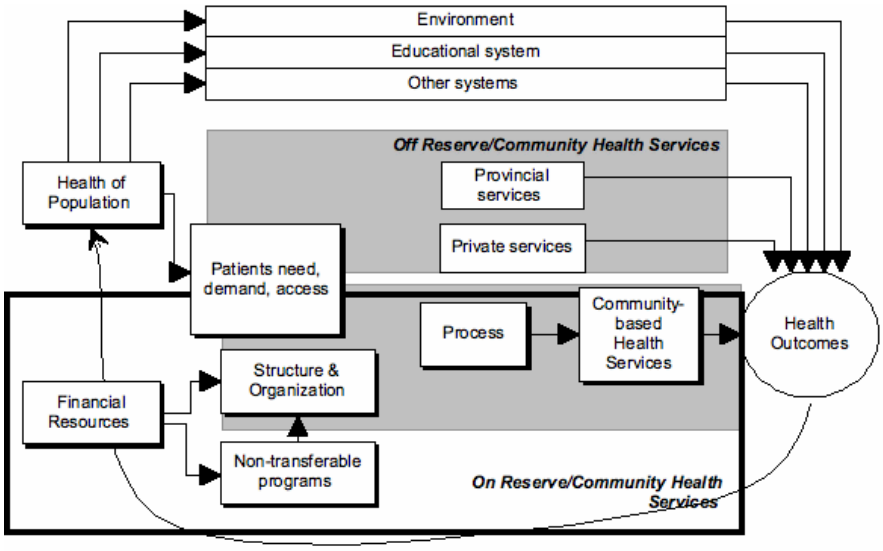

Fig 5: Community Care Planning

Broadly, care planning involves: Anticipatory rather than reactive discussions about patient care; Defining roles and tasks among team members, including the patient; Negotiating agreements that facilitate care within and across organization; supporting patients to manage their own health; Promoting shared decision making; Promoting care that is consistent with scientific evidence and the patient's preferences. Care planning have been implemented in health care systems including Australia, Canada, the US and UK. The Chronic Care Model was developed in response to concerns about the effectiveness of primary care for people with long term conditions. It recognizes that all long-term conditions present a "common set of challenges" to individuals and their families. It aims to support management of the "physical, psychological, and social demands" of conditions through "productive interactions" between practice teams and patients that consistently provide (a) assessments, (b) support for self-management, (c) optimization of therapy; and (d) proactive follow-up (Source: Burt J, Rick J, Blakeman T, Protheroe J, Roland M, Bower P. Care plans and care planning in long-term conditions: a conceptual model. Prim Health Care Res Dev. 2013; 15(4):342-54).

2.3 Monitoring compliance and evaluating effectiveness

Adherence to therapies is a primary determinant of treatment success. Failure to adherence is a serious problem which not only affects the patient but also the health care system. The pharmacist monitors the patient's compliance with and response to drug therapy through regular follow-ups [20, 21]. Tertiary hospitals manage patients with complex care needs. Hospital pharmacists frequently dispense medicines when there is limited global experience with use, but where local prescribers feel their benefit outweighs the risk. These allow for progress evaluation and support and early detection of adverse effects, drug misuse or abuse [22].

Table 1

Exhibit 1. 6 things that an outpatient pharmacy can do to help maintain alignment with its associated hospital [84]
▪ Make sure that the pharmacy's hours of operation align with the peak discharge hours of the hospital and emergency room.
▪ Create and maintain an open line of communication with the nursing staff, especially from the emergency room and telemetry units.
▪ Make sure that the inpatient pharmacists are detailing and promoting the outpatient pharmacy services at every opportunity.
▪ Ask to participate in the weekly or monthly readmission campaign meetings. What is the hospital doing to help prevent readmissions? How can the outpatient pharmacy participate and help meet readmission goals?
▪ Try to meet with the nurse case managers and social workers. We all know about the importance of medication adherence following complicated cardiac and respiratory related hospital stays.
▪ Begin a discussion with the hospital's pharmacy director to create a plan that details what opportunities the outpatient pharmacy may have to help increase HCAHPS scores, which measure patients' perspectives on their care. Opportunities to increase this score involve spearheading specific program development, funding, and implementation in health systems.

3. Committed Relationship with Patients

Many patients interact with the health system at multiple points. Medication therapy may be started, altered or adjusted at any point along this continuum of care by multiple providers. But pharmacists are the health professionals with the best potential to effectively coordinate medication across the continuum. As important members of the health care team, pharmacists work collaboratively with patients' other health care providers in all types of patient care settings ranging from community pharmacies to hospitals and long-term care facilities [23]. In particular, community-based pharmacists are accessible and uniquely positioned to support a continuum of primary care, the challenges of living with chronic disease, assisting people to remain in their homes as they age and assisting people living with mental illness or chronic diseases [24]. The first step in the provision of pharmaceutical care is the establishment of a committed relationship with the patient. To that end, pharmacists must seek and be granted authority by their patients to intervene on their behalf. Pharmacists also may need to secure permission from other health-care providers and patient caregivers (e.g., in cases in which the patient is a child or unable to visit the pharmacy in person) to provide pharmaceutical-care services. The key to doing so in all instances is effective communication. Building a committed relationship cannot occur at a distance. The pharmacist-patient relationship has changed over the past 30 years from one in which pharmacists focused solely on filling prescriptions without questioning a physician's order to one in which pharmacists recommend drug therapy to prescribers and offer personalized advice to patients on how to maximize the benefits of their medication [25]. In addition, by its very nature, pharmaceutical care is an iterative and ongoing process, as long as the patient has unresolved medication-related problems. Therefore, once a rapport has been established, the pharmacist must interact regularly with the patient to strengthen the relationship and to collect additional data necessary to ensure that the patient's pharmaceutical-care needs continue to be met [26].

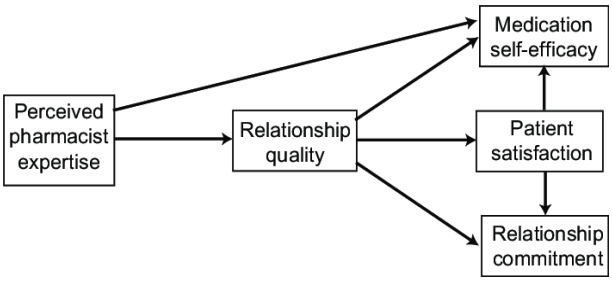

Fig 6: Pathway of the hypothesized model shows the relationships between expertise, therapy optimization, satisfaction and commitment

Patient-perceived pharmacist expertise has been shown to be an independent predictor of patient satisfaction and trust. Relationship quality is "patient's perceptions of his or her provider's social exchange-based, affective qualities, including dimensions of caring, respect, and trustworthiness." The construct of relationship quality in this study has two dimensions: (a) patient trust in a pharmacist and (b) satisfaction with the pharmacist. Relationship commitment can be defined as the likelihood that a patient will seek an interaction and maintain a long-term relationship with his or her pharmacist. Self-efficacy is defined as a patient's confidence in his or her ability to successfully execute a behavior. The Medication Understanding and Use Self-Efficacy scale, has two dimensions: (a) learning about medication and (b) taking medication. The Medication Understanding and Use Self-Efficacy scale has evidence for its validity and reliability. Patient satisfaction is the degree to which patients' expectations, goals, and/or preferences are met by the health care provider and/or service. Patient satisfaction is a unique and multidimensional construct. Various frameworks have been used to conceptualize patient satisfaction with pharmacy services; for instance, patient satisfaction was measured as a single entity and linked with economic, clinical, and humanistic outcomes (Source: Alghurair SA, Simpson SH, Guirguis LM. What elements of the patient-pharmacist relationship are associated with patient satisfaction? Patient Prefer Adherence. 2012; 6:663-76).

4. Provision of Pharmacy Services

In the initial organizational plan or proposal, it is important to detail the individual who will be providing services, the services to be provided, the entity (e.g., patient, caregiver, health care team) to whom services will be provided, the time required for the services, the expected outcomes, and a proposed workflow. Ultimately, the goal would be to implement the Pharmacists' Patient Care Process as defined by the Joint Commission of Pharmacy Practitioners (JCPP). In such a process, the pharmacist is integrated into the delivery of care for the patient in an interprofessional setting [27]. Services to consider implementing include medication reconciliation, MTM, preventative services, and patient-specific medication education and behavioral counseling. However, outpatient pharmacy basic services and functions may include:

4.1 Medication Dispensing

The fundamental concept of medication is to give the right medication to the right patient after proper identification. Drugs should be dispensed at the right dose, route of administration, form and duration of treatment. For patients, the prescription container label may be the only source of instructions on how to take their medicines. In the United States, the legal requirements for a prescription label are set by federal law and state statutes. The container should be comparable to that which manufacturers use to package drug products and should preserve a product's identity, strength, quality, and purity and prevent contamination. Safety features such as a child-resistant closure should be provided. Pharmaceutical products purchased from international online pharmacies are not approved by the FDA and may not meet US guidelines for labeling and packaging. Pharmacy staff works in close collaboration with the different medical departments, nursing services and dietary department to meet customer needs. This is particularly useful with complex patients who have multiple prescribers and more than one condition requiring treatment. Medication dispensing databases are increasingly available for pharmacists on large populations, particularly in countries that provide universal coverage for medicines [28-30].

4.2 Delivery of transition care medications

Usually home care prescriptions are dispensed and refilled from the ambulatory pharmacy as a service to this patient population. Medicare beneficiaries are covered by the US

Social Security Amendment, passed in 1965 and then amended in 1972, which extended health care services to all persons 65 years of age or older. Medicare Part A covers inpatient hospital care, hospice care, and home health care, with deductibles and limits placed on each type of care. Beneficiaries are also eligible for Medicare Part B coverage, which, for a relatively small health insurance premium, allows senior citizens to obtain extended coverage for physician services, outpatient hospital services, home health care services, and a limited number of outpatient drugs (e.g., hepatitis B vaccine, immunosuppressant drugs, pneumococcal and influenza vaccines, and some oral cancer drugs). Optimizing the TOC process, reducing medication errors, and preventing ADEs are important focus areas in the current health care system, as emphasized by The Joint Commission and other health care organizations. Providing a complete and accurate medication reconciliation (MR) at the time of transition is important and improves TOC, especially since most AEs that occur during TOC are adverse drug events. Another study determined that nearly 50% of patients experienced at least one outpatient medical error caused by failure to implement the intended discharge plans for recently hospitalized patients. Ambulatory pharmacists have the unique opportunity and skillset to develop and participate in TOC processes that will enhance medication safety and improve patient care [31-34].

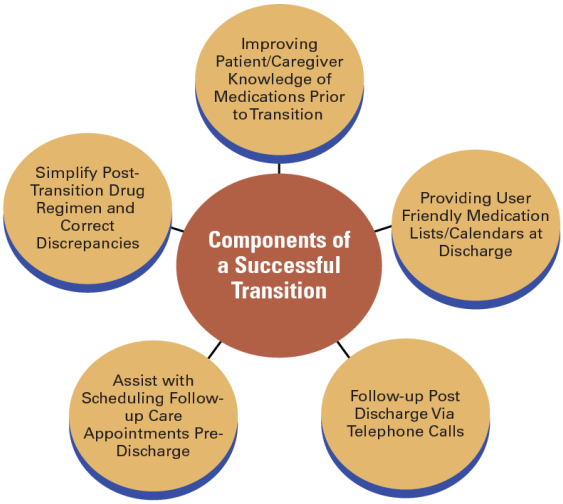

Fig 7: Elements of successful transitional care models

During times of transition, the pharmaceutical care patients receive is often suboptimal and wrought with danger. Home care pharmacists play a pivotal and important role in providing transitional care to patients by identifying and resolving medication discrepancies. Pharmacists must partner with nurses, physicians, and others involved with care transitions to decrease the likelihood of patients experiencing untoward health consequences associated with medications (Coleman & Boult, 2003; Coleman *et al*., 2006; Corbett *et al*., 2010; Dudas *et al*., 2001; Jack *et al*., 2009; Meredith *et al*., 2002; Naylor *et al*., 2004).

4.3 Pharmacists-led medication reconciliation

Medication discrepancies arising at care transitions have been reported as prevalent and are linked with adverse drug events (ADEs) (e.g. re-hospitalization) [35]. More than 25% of errors can be attributed to incorrect medication histories, demonstrating that this is an error-prone process. Gleason and colleagues found that more than 33% of patients had at least one medication discrepancy at admission, and 85% of these originated from the medication history. Obtaining an accurate medication history during transitions of care has been shown to reduce errors that could lead to patient harm and is the foundation of the medication reconciliation process. Reconciliation involves building a complete list of a person's medications, checking them for accuracy, reconciling and documenting any changes. Pharmacy personnel can play a key role in medication safety and prevention of discrepancies upon hospital admission. Buckley and colleagues discovered that greater than 97% of medication histories documented by health care providers other than pharmacists were associated with at least one medication discrepancy [35-40].

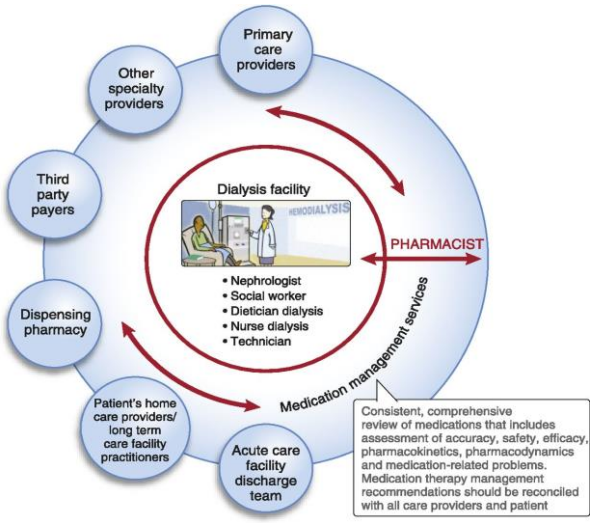

Fig 8: Dialysis facility-centered medication management services model

Providing medication reconciliation and therapy management services is critically important to avoid costs associated with medication-related problems, such as adverse drug events and hospitalizations in the ESRD population. The Medicare Modernization Act of 2003 included an unfunded mandate stipulating that medication therapy management be offered to high-risk patients enrolled in Medicare Part D. Medication management services are distinct from the dispensing of medications and involve a complete medication review for all disease states. In this model of care delivery, a pharmacist can provide crosscutting medication management services by communicating bidirectional between the dialysis unit team and the patient's care providers, family, and payers, closing the loop of communication, improving medication list accuracy, and identifying and resolving MRPs. The pharmacist in this model could function like a consultant, providing medication management services to patients in several dialysis units (Source: Pai AB, Cardone KE, Manley HJ, *et al*. Medication reconciliation and therapy management in dialysis-dependent patients: need for a systematic approach. Clin J Am Soc Nephrol. 2013; 8(11):1988-99).

4.4 Patient counseling and education

In the counseling process, a multi-cultural competence of dispenser is among the key factors affecting his/her successful communication with patients for achieving optimal use of medications. Patient counseling by dispenser is a key competency element in the medication treatment process. To this end, it is critical for the dispensers to provide

desirable and understandable information to patients about their dispensed medications. The dispenser is in a critical position to answer whatever concerns and enquiries of patients toward their medications and even alternate therapeutic approaches they may seek or hear from others. Accordingly, the Australian Pharmaceutical Advisory Council outlines the type of information and resources that should be delivered to patients. Moreover, list of medicines provided on exit from the healthcare facility should be prepared in communication and collaboration with the patient for ease of improving adherence to treatment regimens and patient outcomes. However, for a non-teaching facility, the addition of clinical pharmacy services may alter workflow pace because the practitioner may be accustomed to moving from one patient to the next without stopping to discuss the treatment plan with the health care team. It may be more challenging to provide recommendations and interventions for each individual patient, and as such, an alternative workflow may be necessary. This may include a pharmacist-specific patient and family education visit, which may reduce the time the practitioner needs to spend with each patient, thus allowing a potential increase in provider patient volume. Crowd and noisy hospital environment, over-loaded physicians, and innumerable patients limited hospital staffs to supply more professional services. Counseling people were increased 4 folds in 2015 compared to in 2013. On the one hand, with the development of the pharmaceutical counseling center, more and more people realized the importance of drug safety and accuracy [41-46].

4.5 HMR

MMRs are an excellent example of optimal pharmaceutical care delivery. MMRs were originally conducted by pharmacists and have been a prime component of the expanded clinical services provided by pharmacists worldwide. Home medication reviews are a subtype of MMRs in which patients are interviewed by a health professional in their own home. This was originally designed for pharmacists to recover relevant information from the patient's home that is of value and could otherwise be overlooked by health care professionals. It is intended for the pharmacist to observe the patient's management of their medications and to educate the patient so that the quality use of medicines can be achieved. The HMR has the potential to be a useful tool in patients' management of their medications. There are clear benefits when per-formed well. HMR is an Australian initiative introduced in 2001 to improve quality use of medicines. The pharmacist reviews the patient's drug therapies for drug interactions, adverse effects and inconsistencies with the current published views on therapies. GPs plays a vital role in determining whether patients are likely to benefit from this service as HMRs require a referral from a GP. Studies show that GPs believe HMRs potentially improve medication safety, awareness and management. Home medicines review can:

- Clarify and assure patients about proper use of their medications.
- Increase the patients understanding of their physicians' clinical intentions.
- Promote co-operation between the patient and his clinician.
- Promote better patient compliance with medication regimens and dosages.
- Maximize health outcomes from treatment provided [47-51].

5. Barriers to Pharmaceutical Care

A variety of factors have impeded pharmacists' ability to implement pharmaceutical care and can be grouped into four general categories.

5.1 Individual pharmacist characteristics

Studies have been conducted to establish the challenges to Pharmaceutical care implementation in community and hospital pharmacies in developed countries. The pharmacists' attitudes such as the lack of understanding of the concept, misconception such as patients' unwillingness to pay, fear of changing roles and lack of personal motivation reported. Pharmacists who commit to managing the pharmacotherapy of their patients must be familiar with current advances in the treatment of common diseases and with literature resources/ databases that are available to assist them to make sound therapeutic decisions. The attitudes are characterized by conflicts and egos resulting from differences in status/authority, responsibilities, and training. Finally, oral and written communication skills are central to the provision of pharmaceutical care. Pharmacists need to be trained in applying general affective communicative strategies, listening and reflecting, and responding to uttered cues. Combined with non-specific verbal behavior techniques, such as social talk, these techniques are especially important in addressing patient concerns. Pharmacists should refine their communication styles and patterns constantly to ensure patients receive the information they require for effective treatment. They not only create a safe and inviting atmosphere between the pharmacist and patient but also encourage patients to disclose their emotions and concerns. Furthermore, changing the consultation dynamic may also help; from a professional "coolness" approach at the beginning of the consultation to becoming warmer and avoiding non-verbal cut-offs at the end. Incorporating more open-ended questions and follow-up questions throughout the home visit could increase the flexibility of the protocol and might invite patients to express their concerns. [46, 52-56].

5.2 Practice-Setting Constraints

There are numerous constraints involved, consisting of supply-side (e.g. workforce shortages), demand-side (e.g. obstacles of access to healthcare) and healthcare system constraints (e.g. regulatory constraints). Resource constraints and other factors associated with a particular practice setting also are mentioned frequently as barriers to the provision of pharmaceutical care. For example, pharmacists often complain that they do not have time to provide pharmaceutical care in addition to their normal responsibilities. A lack of financial resources also is mentioned often as a barrier to the provision of pharmaceutical care. Under constrained financial conditions, healthcare services need to demonstrate that they remain cost-effective, given the investment in their provision. Purchasing additional equipment, hiring and training additional personnel, and redesigning the pharmacy can be quite expensive. A further complication exists when the management of the pharmacy organization is not committed to the provision of pharmaceutical care. In that situation, support for even minor modifications of the practice environment may be completely absent. Most pharmacists should be able to offer pharmaceutical care to a limited number of patients without incurring large expenses. Then, as the number of patients receiving care is expanded,

pharmacists can gradually modify the environment to be more conducive to patient-oriented services [19, 57-60].

5.3 Intra-professional Barriers

A fragmented system can be defined as one lacking the integration required to achieve unity of effort. Each part of the system tends to focus on internal tasks and resources, overlooking the system as a whole. Fostering IPC has become one of the core demands of policymakers, funding parties, and health care professionals in practice worldwide. Patients benefit when pharmacists work together. Good team functioning is associated with improved patient outcomes, heightened staff satisfaction, and reduced burnout. In contrast, poor team functioning is associated with poor patient care through adverse events, lack of coordination, and spiraling costs. The NAPRA highlights the importance of collaboration in pharmacist practice. This standard applies not only to pharmacist collaboration with other health care professionals but also to pharmacist collaboration with other pharmacists. Thus, pharmacists from all practice settings and the organizations that represent them must work cooperatively to develop a common agenda for the implementation of pharmaceutical care if this new mission is ever to be fully realized by the profession [60-64].

5.4 Compensation Benefits

Expansion of scope of practice and diminishing revenues from dispensing are requiring pharmacists to increasingly adopt clinical care services into their practices. Pharmacists must be able to receive payment in order for provision of clinical care to be sustainable. However, the body of evidence supports the feeling that pharmaceutical care services add value to patient care by enhancing patient compliance, improving patient outcomes, and reducing healthcare costs. A Canadian strategy for improving the provision of patient-centered care by pharmacists, identifies obtaining remuneration for professional services as a key area of action to support such activities. The cost of the prescription then is based upon the cost to the pharmacy plus a handling charge. As the pharmacy practice literature reporting the clinical benefits of pharmacist cognitive services continues to grow and pharmacy revenues from dispensing alone decrease in light of generic drug price reductions and other factors, the profession is advocating for appropriate payment for clinical services. Pharmacists also, with some success, has billed insurance companies for pharmaceutical care services that were provided to his patients. Indeed, lack of remuneration for services has been cited by community pharmacists as a key barrier preventing the greater provision of clinical services [59, 65-67].

6. Medication risk management

Different medication review procedures are internationally used in both outpatient and inpatient settings. The accurate medication history recording and the medication chart is the basis for safe pharmacotherapy and a starting point for medication reviews. Strategies to prevent ADRs and drug-related hospital admissions are urgently needed, particularly for elderly patients. In addition to other medication safety initiatives, national and international organizations recommend including pharmacists on health care teams to improve medication safety [68, 69]. For each DRP, a specific recommendation should be addressed to the health care team. Each recommendation should be discussed with the healthcare team, and the physician decided if he followed the recommendations. The medication should be checked again and registered, if the recommendation is partly or fully followed.

Table 2

Exhibit 2: Potential Drug Therapy Problems [70]
▪ Use of drug when no drug is necessary
▪ Medical condition which is self-limiting itself
▪ An inappropriate therapy for a specific condition
▪ Incomplete vaccination
▪ Inappropriate dose, dosage regimen, dosage form, dose schedule, route or method of administration
▪ Therapeutic duplication
▪ Hypersensitivity of patient to component of a drug
▪ Adverse drug or devise related events or potential for such event
▪ There are clinically significant drug-drug, drug-disease, drug-food or drug-reagent interaction (during diagnosis)
▪ Drug or non-drug therapy has been affected by social, recreational or non-traditional drug use by the patients or others
▪ Patient is not receiving the full benefit from the prescribed drug or non-drug therapy
▪ Drug or non-drug therapy affected by the financial condition of the patient
▪ Patient's lacking in understanding/misconception of the drug/therapy
▪ Patient non-adherence to drug/therapy

High prevalence of polypharmacy in older adults has been widely reported1. Multiple studies have mentioned that polypharmacy increases the risk of adverse drug reactions, hospitalization, falls, mortality, and other adverse health outcomes in elderly patients. Pharmacogenomics allow identify how hereditary profile affects an individual response to drugs. As a strategy for optimizing medication usage, pharmacogenomics became an important element of precision medicine. A recent study has demonstrated that precision medicine has significant potential in people with polypharmacy particularly in older adults with history of urgent care utilization [72].

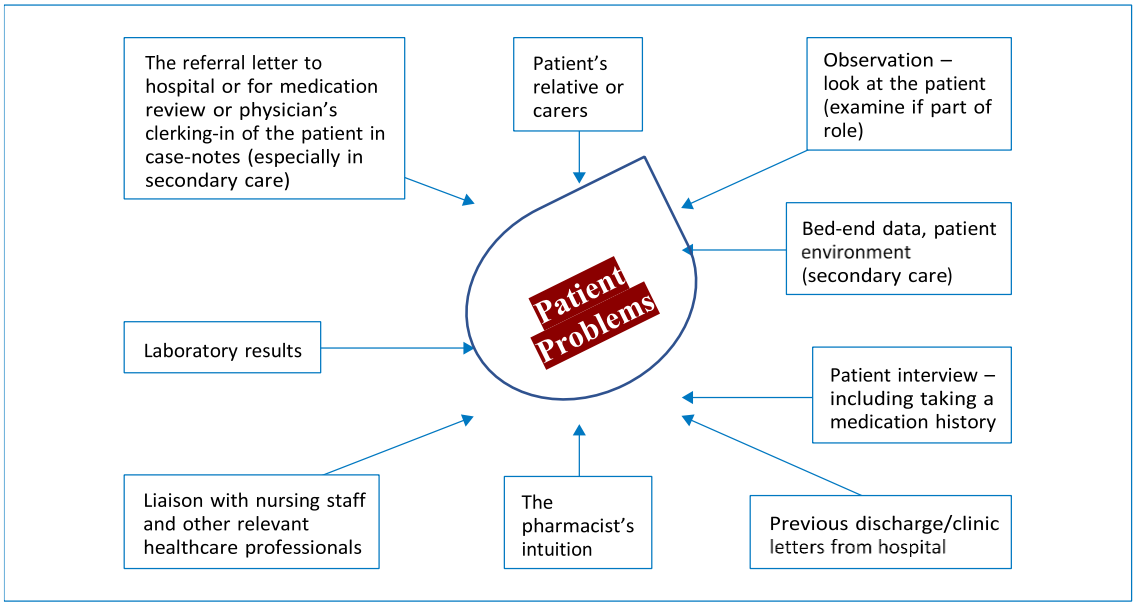

Fig 9: Common sources for deriving the problem list [71]

Poor medication management during or immediately after hospital admission increased the risk of readmission in the next month by 28%. Hospital admissions and discharges, interdepartmental transfers, or care shared between a specialist and a GP, are often dangerous times for patients, especially those with long-term conditions or taking multiple medicines. Patients may take a number of medicines in complex regimens so there is a high potential for drug interactions, particularly given the substantial comorbidity and mortality rates in this population. There are significant discrepancies between the medicines people take at home, the medicines GPs think they are taking at home, medicines listed in GP referral letters, medicines people obtain from pharmacies, the medicines recorded when they are admitted to hospital, and when they leave hospital, and the medicines detailed in their official discharge summary.

Table 3

Exhibit 3: Drug-Related Problems Encountered by Pharmacist Monitoring [72]
▪ Untreated condition
▪ Improper drug selection
▪ Under-dose
▪ Failure of patient to receive drug
▪ Overdose
▪ ADR
▪ Drug-food interaction
▪ Drug without indication
▪ Nonadherence
▪ Duplicate therapy
▪ Allergies
▪ Requiring renal or hepatic adjustments
▪ Poly-pharmacy

Pharmaceutical care focuses on activities that lead to positive patient outcomes, and accepting end results of medication therapy remains important in providing such services. A pharmacist must be a scientific problem solver, a good communicator, educator and learner. Primary activities involved in pharmaceutical care include: obtaining a medication history, identifying real and potential DRPs, developing a pharmacy care plan to include implementing and monitoring parameters to resolve and prevent drug-related problems, and evaluating the plan to determine if clinical outcomes have been achieved through documentation, patient consultation follow-up to determine if the desired clinical outcomes have been achieved. Future trends in drug development will increase the pharmacist's role in drug selection, in an effort to ensure both safety and cost containment. All this is achievable through competent skills and knowledge gained to provide reliable coordinated services. There was a trend for the number of pharmacist-hours containing at least one potentially serious dispensing error to increase as the prescription-filling rate accelerated. Outpatient pharmacies with high volumes should set a limit to the number of prescriptions filled by their pharmacists and should experiment with quality assurance systems to reduce dispensing errors and subsequent legal liabilities [72-74].

7. Outpatient service through telemedicine

Telemedicine refers to the delivery of clinical services using technology that allows two-way, real time, interactive communication (including telemonitoring and video including follow-up telephone calls) between the patient and the pharmacist at a distant site. In the Unites States, the increasing shortage of primary care providers and specialists represents an opportunity for pharmacists to assume a more prominent role managing patients with chronic disease in the ambulatory care setting. However, lack of reimbursement may pose a barrier to the provision of care by pharmacists using telemedicine [75]. Generally, telemedicine modalities fall into one of two categories: synchronous or asynchronous. In synchronous telemedicine, a confidential, interactive, two-way audio and video connection replaces the in-person, face-to-face visit, using specialized equipment to perform an accurate and reliable history and physical exam. Synchronous telemedicine models are typically used to manage acute and chronic diseases that rely significantly on a real-time patient interaction or the physical exam, such as the management of chronic infectious diseases, pulmonary medicine, diabetes management and telepsychiatry [76].

Table 4

Exhibit 4: Terminologies Associated with Telehealth [77-79]	
Term	**Definition**
Telehealth	The term telehealth is used to encompass a broader definition of remote healthcare that does not always involve clinical services.
Telemedicine	Telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve patients' health status. Telemedicine is the use of two-way real-time interactive audio and video between places of lesser and greater medical capability or expertise to provide and support health care, when distance separates participants who are in different geographical locations.
Telecare	Telecare is the term that relates to technology that enables patients to maintain their independence and safety while remaining in their own homes. This technology includes mobile monitoring devices, medical alert systems, and telecommunications technology like computers and telephones. Continuous remote monitoring of patients enables telecare to track lifestyle changes over time as well as receiving alerts relating to real-time emergencies.
Teleconsultation	Consultation between a provider and specialist at distance using either store and forward telemedicine or real-time videoconferencing.
Tele-mentoring	The use of audio, video, and other telecommunications and electronic information processing technologies to provide individual guidance or direction.
Telemonitoring	The process of using audio, video, and other telecommunications and electronic information processing technologies to monitor the health status of a patient from a distance.
Telepharmacy	Telepharmacy is defined as the provision of pharmaceutical care to patients through the use of telecommunications and information technologies.
Store-and-Forward "Asynchronous Communication"	Type of telehealth encounter or consult that uses still digital images of patient data for rendering a medical opinion or diagnosis (e.g. in radiology, pathology, dermatology, ophthalmology, and wound care). Store and forward includes the asynchronous transmission of clinical data from one site to another (e.g. email).

In US 20% of the total people are rural based, only 9% of their physicians have posting there. It is estimated that as of 2016 at least 20% of the US population did not have equal access to health care. In addition to rural areas, telemedicine services have also expanded into prisons, military bases, and school systems. Among 110 million medical visits were conducted in 2015, 59 million were conducted on-line, over the internet, or by using mobile devices, accounting more than 50% of patient visits. Since pharmacists are not recognized by CMS as healthcare providers, they cannot be reimbursed for services rendered under most traditional fee-for-service arrangements. In conclusion, pharmacists have a unique opportunity to use telemedicine models as a means to improve access to care and chronic disease management in both rural and urban populations within the ambulatory setting. Electronic health (eHealth) tools incorporate many opportunities for patients to increase their engagement through focused disease-specific learning, options to receive regular feedback and frequent reinforcement (e.g., peripheral monitoring devices). Additional inbuilt support functions that assess progress, provide goal setting and problem solving, aim to increase the patient's skill and confidence in managing their health problems. Supplementary motivational interviewing and cognitive behavioral components can also be provided via the internet, mobile device or telephone [80, 81]. Micro-hospitals are 24-hour, small inpatient facilities with an average of 2 to 10 beds, designed to provide a diversity of healthcare services consistent with community demands. In addition, they seek to combine a cost-effective healthcare vehicle with potential time-dependent triage/transfer capabilities to a nearby large medical center. This smaller cost-effective entity represents an ideal vehicle for telemedicine, whereby specialists are always on hand for interpretation and consultation, with minimal patient waiting [82].

8. Challenges of chronic health management

There are significant differences between acute and chronic disease that require different approaches to care. The American health care system is built on an acute care paradigm; in general, acute care problems have a rapid onset, are short in duration, and result from a single cause. Chronic care problems are slower to develop, longer in duration, and have multiple causes, some of which occur years before the onset of symptoms. These differences limit the current system's ability to deal effectively with a number of unique challenges in managing chronic disease:

- The social, behavioral, and psychosocial elements associated with chronic disease (e.g., the often-unrecognized elements of self-image related to being a person with disease).
- The need for continuing care, often throughout the remainder of the patient's life.
- The influence of chronic disease on the patient's extended family and the very real need for the family's ongoing support for long-term success.
- The influence of lifestyle factors in both the causation and long-term management of chronic disease.

Caring for the population of patients with chronic conditions requires a new paradigm-one that encompasses longitudinal care and unplanned episodes of care. To a large extent, the development and implementation of such a system will hinge on addressing 4 specific challenges17:

- Realigned Reimbursement—In general, payment for health care services is triggered by acute care episodes. There must be a mechanism whereby providers are compensated to manage a broad range of chronic conditions that never resolve and that are not characterized by episodes of care.
- Team-Based Care-An adequate number of non-physician health care team members in disciplines such as nursing, social work, community health coaching, and pharmacy must be trained and available to coordinate proven team-based care.
- Patient and Family Engagement-expanded opportunities for patient and family engagement in self-management programs are essential for improving patients' ability to

manage their conditions and adhere to treatment plans.
- Information Sharing-The current acute episode-focused medical record system must be redesigned to improve clinicians' ability to share information regarding patients with chronic disease and facilitate the use of evidence-based decision support in their care [83].

9. Conclusion

In most countries, existing health care systems do not optimize the practices of all health professionals and cost an increasing amount without comparable increases in quality and accessibility. Numerous proposals have been made on how to address these shortcomings. Achieving these goals require different health professionals to work in collaboration with each other to meet the health needs of patients. In order for that to happen, governments must work with all key professional groups to use all available resources of the system most effectively and, importantly, pharmacists must be recognized as the professional that coordinates drug therapy management. In addition, governments must put in place policies and a regulatory and funding environment that facilitates team-based care and acknowledges and supports the professional competencies of all health professions.

10. Article Summary

Pharmacy is evolving from a product-oriented to a patient-oriented profession. This role modification is extremely healthy for the patient, the pharmacist, and other members of the health-care team. However, the evolution will present pharmacists with a number of new challenges. Now, more than in the past, pharmacists must make the acquisition of contemporary practice knowledge and skills a high priority, to render the level of service embodied in the concept of pharmaceutical care. Pharmacy educators' organizations and regulatory bodies must all work together to support pharmacists as they assume expanded health-care roles. Pharmacy and the health-care industry must work to ensure that the pharmacist is compensated justly for all services. But before this can happen it will be necessary for pharmacy to demonstrate value-added to the cost of the prescription. Marketing of the purpose of pharmacy in the health-care morass and of the services provided by the pharmacist is needed to generate an appropriate perceived value among purchasers and users of health-care services. Pharmacists should view themselves as dispensers of therapy and drug effect interpretations as well as of drugs themselves. Service components of pharmacy should be identified clearly to third party payers and be visible to consumers, so that they know what is available at what cost and how it may be accessed. In the future, pharmacy services must be evaluated on patient outcome (i.e., pharmaceutical care) rather than the number of prescriptions dispensed, and pharmacy must evolve toward interpretation and patient consultation, related to the use of medication technologies.

11. References

1. Rondinelli JL, Omery AK, Crawford CL, Johnson JA. Self-reported activities and outcomes of ambulatory care staff registered nurses: an exploration. Perm J. 2014; 18(1):e108-15.
2. Walus AN, Woloschuk DMM. Impact of Pharmacists in a Community-Based Home Care Service: A Pilot Program. Can J Hosp Pharm. 2017; 70(6):435-442.
3. ASHP Foundation Trends Report. Pharmacy Forecast 2016–2020 Strategic Planning Advice For Pharmacy Departments In Hospitals And Health Systems. Available From: http://www.ashpfoundation.org/PharmacyForecast2016
4. Beans BE. Experts Foresee a Major Shift From Inpatient to Ambulatory Care. PT. 2016; 41(4):231-7.
5. Knoer SJ. Healthcare delivery and financing: staying ahead of intense competition. In: Zellmer WA, editor. Pharmacy Forecast 2016–2020. Strategic Planning Advice for Pharmacy Departments in Hospitals and Health Systems. Bethesda, Maryland: ASHP Research and Education Foundation; Dec, 2015, 5-8
6. Zellmer WA, editor. Pharmacy Forecast 2016–2020. Strategic Planning Advice for Pharmacy Departments in Hospitals and Health Systems. Bethesda, Maryland: ASHP Research and Education Foundation; Dec, 2015. Available at: www. Ashpfoundation.org/PharmacyForecast2016 Accessed February 8, 2016.
7. Williams C. Pharmacy work force: market forces stimulate change in pharmacy practice models. In: Zellmer WA, editor. Pharmacy Forecast 2016–2020. Strategic Planning Advice for Pharmacy Departments in Hospitals and Health Systems. Bethesda, Maryland: ASHP Research and Education Foundation, 2015, 25-28.
8. Institute of Medicine (US) Committee on the Health Professions Education Summit; Greiner AC, Knebel E, editors. Health Professions Education: A Bridge to Quality. Washington (DC): National Academies Press (US). Chapter 3, The Core Competencies Needed for Health Care Professionals, 2003.
9. Kehrer JP, Eberhart G, Wing M, Horon K. Pharmacy's role in a modern health continuum. Can Pharm J (Ott). 2013; 146(6):321-4.
10. Manolakis PG, Skelton JB. Pharmacists' contributions to primary care in the United States collaborating to address unmet patient care needs: the emerging role for pharmacists to address the shortage of primary care providers. Am J Pharm Educ. 2010; 74(10):S7.
11. Kiel WJ, Phillips SW. Impact of Pharmacist-Conducted Comprehensive Medication Reviews for Older Adult Patients to Reduce Medication Related Problems. Pharmacy (Basel). 2017; 6(1):2. Published 2017 Dec 31. doi:10.3390/pharmacy6010002
12. National Academy of Engineering (US) and Institute of Medicine (US) Committee on Engineering and the Health Care System; Reid PP, Compton WD, Grossman JH, *et al*., editors. Building a Better Delivery System: A New Engineering/Health Care Partnership. Washington (DC): National Academies Press (US); 2005. 2, A Framework for a Systems Approach to Health Care Delivery.
13. Hata M, Klotz R, Sylvies R, *et al*. Medication therapy management services provided by student pharmacists. Am J Pharm Educ. 2012; 76(3):51.
14. Murphy-Menezes M. Role of the Pharmacist in Medication Therapy Management Services in Patients With Osteoporosis. Clin Ther. 2015; 37(7):1573-86. doi: 10.1016/j.clinthera.2015.03.023. Epub 2015 Apr 23. Review. PubMed PMID: 25913920.
15. Hardavella G, Aamli-Gaagnat A, Saad N, Rousalova I, Sreter KB. How to give and receive feedback effectively. Breathe (Sheff). 2017; 13(4):327-333.
16. Chevalier BAM, Watson BM, Barras MA, Cottrell WN. Investigating strategies used by hospital pharmacists to

effectively communicate with patients during medication counselling. Health Expect. 2017; 20(5):1121-1132.
17. Blenkinsopp A, Bond C, Raynor DK. Medication reviews. Br J Clin Pharmacol. 2012; 74(4):573-80.
18. Vahdat S, Hamzehgardeshi L, Hessam S, Hamzehgardeshi Z. Patient involvement in health care decision making: a review. Iran Red Crescent Med J. 2014; 16(1):e12454.
19. Dalton K, Byrne S. Role of the pharmacist in reducing healthcare costs: current insights. Integr Pharm Res Pract. 2017; 6:37-46. Published 2017 Jan 25. doi:10.2147/IPRP.S108047
20. Jimmy B, Jose J. Patient medication adherence: measures in daily practice. Oman Med J. 2011; 26(3):155-9.
21. Omboni S, Caserini M. Effectiveness of pharmacist's intervention in the management of cardiovascular diseases. Open Heart. 2018; 5(1):e000687. Published 2018 Jan 3. doi:10.1136/openhrt-2017-000687
22. Keith C. Automated adverse drug reaction detection. Aust Prescr. 2018; 41(5):138.
23. American Pharmacists Association (APhA). Pharmacists' Impact on Patient Safety. A Joint Project of the American Pharmacists Association Academy of Pharmacy Practice and Management and Academy of Pharmaceutical Research and Science. Available From: https://www.pharmacist.com/sites/default/files/PharmacistsImpactonPatientSafety_Web.pdf
24. Gallagher HC. New fitness-to-practice requirements for pharmacists in Ireland: implications for undergraduate pharmacy education. Med Teach. 2010; 32(2):e71-7. doi: 10.3109/01421590903199635. PubMed PMID: 20163219.
25. Haddad AM. Reflections on the Pharmacist-Patient Covenant. Am J Pharm Educ. 2018; 82(7):6806.
26. Wolters M, van Hulten R, Blom L, Bouvy ML. Exploring the concept of patient centred communication for the pharmacy practice. Int J Clin Pharm. 2017; 39(6):1145-1156.
27. Joint Commission of Pharmacy Practitioners. Pharmacists' patient care process. Available From: http://www.amcp.org/patientcare-process/. Accessed December 19, 2017.
28. Bhimji SS, Scherbak Y. Medication Errors. [Updated 2018 Oct 27]. In: Stat Pearls [Internet]. Treasure Island (FL): StatPearls Publishing, 2018.
29. Veronin M. Packaging and labeling of pharmaceutical products obtained from the internet. J Med Internet Res. 2011; 13(1):e22. Published 2011 Feb 15. doi:10.2196/jmir.1441
30. Pratt N, Roughead E. Assessment of Medication Safety Using Only Dispensing Data. Curr Epidemiol Rep. 2018; 5(4):357-369.
31. Scott DM. United States Health Care System: A Pharmacy Perspective. Can J Hosp Pharm. 2016; 69(4):306-15.
32. American College of Clinical Pharmacy. Hume AL, Kirwin J, Bieber HL, Couchenour RL, Hall Dl, Kennedy AK, LaPointe NM, Burkhardt CD, Schilli K, Seaton T, Trujillo J, Wiggins B. Improving care transitions: current practice and future opportunities for pharmacists. Pharmacotherapy. 2012; 32(11):e326-e337. doi: 10.1002/phar.1215.
33. Sen S, Bowen JF, Ganetsky VS, *et al*. Pharmacists implementing transitions of care in inpatient, ambulatory and community practice settings. Pharm Pract (Granada). 2014; 12(2):439.
34. Moore C, Wisnivesky J, Williams S, McGinn T. Medical errors related to discontinuity of care from an inpatient to an outpatient setting. J Gen Intern Med. 2003; 18(8):646–651.
35. Redmond P, Grimes TC, McDonnell R, Boland F, Hughes C, Fahey T. Impact of medication reconciliation for improving transitions of care. Cochrane Database Syst Rev. 2018; 8:CD010791. doi: 10.1002/14651858.CD010791.pub2. Review. PubMed PMID: 30136718.
36. Digiantonio N, Lund J, Bastow S. Impact of a Pharmacy-Led Medication Reconciliation Program. P T. 2018; 43(2):105-110.
37. Abdulghani KH, Aseeri MA, Mahmoud A, Abulezz R. The impact of pharmacist-led medication reconciliation during admission at tertiary care hospital. Int J Clin Pharm. 2018; 40(1):196-201. doi: 10.1007/s11096-017-0568-6. Epub 2017 Dec 16. PubMed PMID: 29248986.
38. Mekonnen AB, McLachlan AJ, Brien JE, Mekonnen D, Abay Z. Evaluation of the impact of pharmacist-led medication reconciliation intervention: a single centre pre-post study from Ethiopia. Int J Clin Pharm. 2018; 40(5):1209-1216. doi: 10.1007/s11096-018-0722-9. Epub 2018 Aug 28. PubMed PMID: 30155773.
39. Cheema E, Alhomoud FK, Kinsara ASA, *et al*. The impact of pharmacists-led medicines reconciliation on healthcare outcomes in secondary care: A systematic review and meta-analysis of randomized controlled trials. PLoS One. 2018; 13(3):e0193510. Published 2018 Mar 28. doi:10.1371/journal.pone.0193510
40. Bonetti AF, Reis WC, Lombardi NF, Mendes AM, Netto HP, Rotta I, Fernandez-Llimos F, Pontarolo R. Pharmacist-led discharge medication counselling: A scoping review. J Eval Clin Pract. 2018; 24(3):570-579. doi: 10.1111/jep.12933. Epub 2018 Apr 24. Review. PubMed PMID: 29691955.
41. Lampkin SJ, Gildon B, Benavides S, Walls K, Briars L. Considerations for Providing Ambulatory Pharmacy Services for Pediatric Patients. J Pediatr Pharmacol Ther. 2018; 23(1):4-17.
42. Hirko N, Edessa D, Sisay M. Exit-Knowledge of Ambulatory Patients about Medications Dispensed in Government Hospital in Eastern Ethiopia: The Need for Focused Patient Counseling. Front Public Health. 2018; 6:254. Published 2018. Doi: 10.3389/fpubh. 2018.00254
43. Australian Pharmaceutical Advisory Council (APAC) Guiding Principles to Achieve Continuity in Medication Management. Camberra, ACT: Commonwealth of Australia, 2005, 1-52.
44. Utilization Review Accreditation Commission (URAC) Supporting Patient Medication Adherence: Ensuring Coordination, Quality and Outcomes. Columbia, WA: URAC, 2011, 1-22.
45. Gu H, Sun L, Jin R, Li F, Wei Y, Xie Z. Evaluation of counseling environmental alteration on pharmacy-patient communication qualifications: A case-control study. Medicine (Baltimore). 2016; 95(52):e5738.
46. Ensing HT, Vervloet M, van Dooren AA, Bouvy ML, Koster ES. Patient-pharmacist communication during a post-discharge pharmacist home visit. Int J Clin Pharm. 2018; 40(3):712-720.

47. Basheti IA, Qunaibi EA, AbuRuz S, Samara S, Bulatova NR. Home medication reviews in a patient care experience for undergraduate pharmacy students. Am J Pharm Educ. 2013; 77(8):173.
48. Ahn J, Park JE, Anthony C, Burke M. Understanding, benefits and difficulties of home medicines review - patients' perspectives. Aust Fam Physician. 2015; 44(4):249-53. PubMed PMID: 25901411.
49. Dhillon AK, Hattingh HL, Stafford A, Hoti K. General practitioners' perceptions on home medicines reviews: a qualitative analysis. BMC Fam Pract. 2015; 16:16. Published 2015. doi:10.1186/s12875-015-0227-8
50. Swain L, Barclay L. Medication reviews are useful, but the model needs to be changed: Perspectives of Aboriginal Health Service health professionals on Home Medicines Reviews. BMC Health Serv Res. 2015; 15:366. Published 2015 Sep 10. doi:10.1186/s12913-015-1029-3
51. Chen TF. Pharmacist-Led Home Medicines Review and Residential Medication Management Review: The Australian Model. Drugs Aging. 2016; 33(3):199-204. doi: 10.1007/s40266-016-0357-2. PubMed PMID: 26961696.
52. El Hajj MS, Hammad AS, Afifi HM. Pharmacy students' attitudes toward pharmaceutical care in Qatar. Ther Clin Risk Manag. 2014; 10:121-9. Published 2014 Feb 18. doi:10.2147/TCRM.S56982
53. Okonta JM, Okonta EO, Ofoegbu TC. Barriers to Implementation of Pharmaceutical Care by Pharmacists in Nsukka and Enugu metropolis of Enugu State. J Basic Clin Pharm. 2012; 3(2):295-8.
54. Acheampong F, Anto BP. Perceived barriers to pharmacist engagement in adverse drug event prevention activities in Ghana using semi-structured interview. BMC Health Serv Res. 2015; 15:361. Published 2015 Sep 7. doi:10.1186/s12913-015-1031-9
55. Wick JY. 5 Tips for Improving Communication in the Pharmacy. Pharmacy Times®, 2015.
56. Phokeo V, Hyman I. Provision of pharmaceutical care to patients with limited English proficiency. Am J Health Syst Pharm. 2007; 64(4):423-9. PubMed PMID: 17299181.
57. Fakeye TO, Adisa R, Olukotun RT, Morawo PK. Hospital and community pharmacists' perception of the scope, barriers and challenges of pharmacy practice-based research in Nigeria. Pharm Pract (Granada). 2017; 15(1):881.
58. Committee on Optimizing Scheduling in Health Care; Institute of Medicine; Kaplan G, Lopez MH, McGinnis JM, editors. Transforming Health Care Scheduling and Access: Getting to Now. Washington (DC): National Academies Press (US), in Access, Scheduling, and Wait Times, 2015, 2.
59. Newton GD. Chapter 123. Ambulatory Patient Care. In: David B. Troy, Paul Beringer. Volume 2 of Remington the Science and Practice of Pharmacy 21st Edition. Lippincott Williams & Wilkins, 2006.
60. Van Baal P, Morton A, Severens JL. Health care input constraints and cost effectiveness analysis decision rules. Soc Sci Med. 2018; 200:59-64.
61. Gobis B, Yu A, Reardon J, Nystrom M, Grindrod K, McCarthy L. Prioritizing intraprofessional collaboration for optimal patient care: A call to action. Can Pharm J (Ott). 2018; 151(3):170-175. Published 2018 Apr 2. doi:10.1177/1715163518765879
62. Lyngsø AM, Godtfredsen NS, Frølich A. Inter organizational Integration: Healthcare Professionals' Perspectives on Barriers and Facilitators within the Danish Healthcare System. Int J Integr Care. 2016; 16(1):4. Published 2016 Mar 31. doi:10.5334/ijic.2449
63. Kaiser L, Bartz S, Neugebauer EAM, Pietsch B, Pieper D. Interprofessional collaboration and patient-reported outcomes in inpatient care: protocol for a systematic review. Syst Rev. 2018; 7(1):126. Published 2018 Aug 21. doi:10.1186/s13643-018-0797-3
64. Miller CJ, Kim B, Silverman A, Bauer MS. A systematic review of team-building interventions in non-acute healthcare settings. BMC Health Serv Res. 2018; 18(1):146. Published 2018 Mar 1. Doi: 10.1186/s12913-018-2961-9.
65. Houle SK, Grindrod KA, Chatterley T, Tsuyuki RT. Paying pharmacists for patient care: A systematic review of remunerated pharmacy clinical care services. Can Pharm J (Ott). 2014; 147(4):209-32.
66. Tannenbaum C, Tsuyuki RT. The expanding scope of pharmacists' practice: implications for physicians. CMAJ. 2013; 185(14):1228-32.
67. Kliethermes MA. Understanding health care billing basics. Pharm Today. 2017; 23(7):57-68
68. Schepel L, Lehtonen L, Airaksinen M, Ojala R, Ahonen J, Lapatto-Reiniluoto O. Medication reconciliation and review for older emergency patients requires improvement in Finland. Int J Risk Saf Med. 2018; 30(1):19-31.
69. Lenssen R, Schmitz K, Griesel C, *et al*. Comprehensive pharmaceutical care to prevent drug-related readmissions of dependent-living elderly patients: a randomized controlled trial. BMC Geriatr. 2018; 18(1):135. Published 2018 Jun 4. doi:10.1186/s12877-018-0814-3.
70. Earls G, Reinhold JA. Chapter 1. Approach to the patient and patient centered care process. In: Jennifer A. Reinhold, Grace Earl. Clinical Therapeutics Primer: Link to the Evidence for the Ambulatory Care Pharmacist, published by Jones & Bartlett Publishers, 2012, 10.
71. Problem identification and prioritization. Available From: http: //www.pharmpress.com/files/docs/pcme_sample_ch.pdf
72. Vadher D, Cannon BC. Chapter 122. Development of a Pharmacy Care Plan and Patient Problem Solving. In: David B. Troy, Paul Beringer. Of Remington The Science And Practice Of Pharmacy 21st Edition. Lippincott Williams & Wilkins, 2006, 2.
73. Wheeler AJ, Scahill S, Hopcroft D, Stapleton H. Reducing medication errors at transitions of care is everyone's business. Aust Prescr. 2018; 41(3):73-77.
74. Viswanathan M, Kahwati LC, Golin CE, *et al*. Medication Therapy Management Interventions in Outpatient Settings [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2014 Nov. (Comparative Effectiveness Reviews, No. 138.) Appendix A, Literature Search Strategies.
75. Littauer SL, Dixon DL, Mishra VK, Sisson EM, Salgado TM. Pharmacists providing care in the outpatient setting through telemedicine models: a narrative review. Pharm Pract (Granada). 2017; 15(4):1134.
76. Telehealth: Increasing Access to High Quality Care by

Expanding the Role of Technology in Correctional Medicine. J Clin Med. 2017; 6(2):20. Published 2017 Feb 13. doi:10.3390/jcm6020020
77. eVisit. What is the difference between telemedicine, telecare and telehealth? Available From: https://evisit. com/what-is-the-difference-between-telemedicine-tele care-and-telehealth/
78. American Telemedicine Association. Telemedicine Glossary. Available From: http: //thesource.americante lemed.org/resources/telemedicine-glossary
79. Center for Connected Health Policy at the National Telehealth Policy Resource Center. NC State Law Telemedicine/Telehealth Definition. Available From: http://www.cchpca.org/nc-state-law-telemedicinetele health-definition
80. Vogenberg FR, Santilli J. Healthcare Trends for 2018. Am Health Drug Benefits. 2018; 11(1):48-54.
81. Parker S, Prince A, Thomas L, *et al*. Electronic, mobile and telehealth tools for vulnerable patients with chronic disease: a systematic review and realist synthesis. BMJ Open. 2018; 8(8):e019192. Published 2018 Aug 29. doi:10.1136/bmjopen-2017-019192
82. Stefano GB, Kream RM. The Micro-Hospital: 5G Telemedicine-Based Care. Med Sci Monit Basic Res. 2018; 24:103-104. Published 2018 Jul 14. doi:10.12659/MSMBR.911436
83. Clarke JL, Bourn S, Skoufalos A, Beck EH, Castillo DJ. An Innovative Approach to Health Care Delivery for Patients with Chronic Conditions. Popul Health Manag. 2017; 20(1):23-30
84. Leuck S. 6 Tips to Align an Outpatient Pharmacy with Its Associated Hospital. Pharmacy Times®, 2016.