ABSTRACT

Medication-related problems are common among home care patients who take many medications and have complex medical histories and health problems. The goals of home health care services are to help individuals to improve function and live with greater independence; to promote the client’s optimal level of well-being; and to assist the patient to remain at home, avoiding hospitalization or admission to long-term care institutions. Home care is an arrangement of care given by gifted experts to patients in their homes under the heading of a doctor. Home medicinal services administrations incorporate nursing care; physical, word related, and discourse dialect treatment; and therapeutic social administrations. Doctors may allude patients for home social insurance administrations, or the administrations might be asked for by relatives or patients. The scope of home social insurance benefits a patient can get at home is boundless. Contingent upon the individual patient’s circumstance, care can extend from nursing care to specific therapeutic administrations, for example, research facility workups. Normal analyses among home social insurance patients incorporate circulatory infection, coronary illness, damage and harming, musculoskeletal and connective tissue sickness and respiratory malady.

Keywords: Pharmacists; Patient; Ambulatory Care; Compliance; ADR; Palliative Care; Elderly

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Figure 1. Patient Centered Medical Home Management. The American Academy of Family Physicians defines a medical home as one that is based on the Joint Principles of the Patient-Centered Medical Home (PCMH), the Shared Principles of Primary Care, and the five key functions of advanced primary care. Through implementing medical home functions, practices seek to improve the quality, effectiveness, and efficiency of the care they deliver while responding to each patient's unique needs and preferences. The American Academy of Pediatrics (AAP) introduced the medical home concept in 1967, initially referring to a central location for archiving a child's medical record. In its 2002 policy statement, the AAP expanded the medical home concept to include these operational characteristics: accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective care. The American Academy of Family Physicians (AAFP) and the American College of Physicians (ACP) have since developed their own models for improving patient care called the “medical home” (AAFP, 2004) or “advanced medical home” (ACP, 2006) (Source: Cox JV, Kirschner N. Patient-centered medical home: Renewing Primary Care. J Oncol Pract. 2008 Nov;4(6):285-6. doi: 10.1200/JOP.0861501. PubMed PMID: 20856760; PubMed Central PMCID: PMC2793908).

1. Introduction
The scope of pharmacy services available in home-care continues to expand. Home care is a course of action of care given by talented specialists to patients in their homes under the heading of a specialist. Home restorative administrations organizations fuse nursing care; physical, word related, and talk lingo treatment; and remedial social organizations. Specialists may imply patients for home social protection organizations, or the organizations may be requested by relatives or patients. The extent of home social protection benefits a patient can get at home is unfathomable. Dependent upon the individual patient's condition, care can stretch out from nursing care to explicit remedial organizations, for instance, look into office workups. Typical investigations among home social protection patients join circulatory contamination, coronary disease, harm and
hurting, musculoskeletal and connective tissue affliction and respiratory ailment. Patient-centered communication is associated with increased patients' satisfaction, better recall of information and improved health outcomes and requires active participation of both the pharmacist and the patient. Patients should be encouraged to express their needs and concerns regarding their medication, which pharmacists should address to support patients in making informed decision. Current viewpoints to consider in building up or assessing clinical pharmacy administrations offered in a home care setting include: staff competency, perfect target tolerant populace, staff security, utilization of innovation, community associations with other medicinal services suppliers, exercises performed amid a home visit, and pharmacist self-sufficiency. Picking up knowledge in the correspondence amid these home visits could be profitable for advancing these visits; and therefore, to enhance persistent well-being at readmission to essential care. A home visit convention empowers pharmacists:

- To address known major challenges during the transition from hospital to primary care
- To address patient's dissatisfaction about health care is important as it facilitates patient participation during consultation and acceptance of pharmacists' advices
- To discuss patients' medication beliefs and adherence issues more frequently, which might be facilitated by additional pharmacist training and increasing patient engagement

2. Client Recruitment and Home Visits

Upon admission to the office, any home care customer taking at least nine medications, including over-the-counter items and herbal enhancements, is offered a pharmacist home visit. Prior to the home visit, the pharmacist audits the customer's rundown of requested medications and graph notes from other home care clinicians, for example, attendants, word related therapists, and physical therapists. Amid the home visit, the pharmacist examines each drug, including over-the-counter items and herbal enhancements, with the customer and caregiver to evaluate their sign, adequacy, well-being, and consistence, including reasonableness. After the main home visit, the pharmacist contacts the customer's prescriber with any suggestions for upgrading drug therapy. This correspondence is finished by electronic wellbeing record, phone, or fax. Basic proposals incorporate ceasing pointless or copy therapies or changing medicine portions. Follow-up care is composed by the pharmacist and nurse [1].

2.1. Benefits of the Pharmacy Home Visit Program

Although nurses and therapist, depending on client need and orders, assess all of a client's needs, the pharmacist is able to focus primarily on medications. Through the MOCH program, pharmacists and pharmacy technicians working with their health and social care colleagues and care homes staff, patients and their families, can provide a number of benefits for care homes and their residents including:

- Optimizing medications (halting wrong or hazardous drugs, and guaranteeing meds increase the value of patient's wellbeing and prosperity)
- Patient focused care (shared basic leadership about which drugs care home occupants take and stop)
- Creating better medications frameworks for care homes to decrease waste and wastefulness
- Training and supporting care home staff to improve more secure organization of drugs [2].
- Available investigations have indicated diminished human services usage, diminished expenses to the wellbeing framework, and enhanced drug the executives with pharmacy inclusion in home care.
- Beneficial persistent results of pharmacy practice in home care settings, for example, diminished medical clinic confirmations,
diminished crisis division visits, enhanced personal satisfaction, enhanced consistence, and diminished antagonistic occasions, have been depicted in many created nations.

- Positive impacts of pharmacy practice in walking care settings, for example, diminished benzodiazepine use, enhanced nervousness scores, enhanced heart results, and enhanced consistence.
- Most home care pharmacy programs in created nations give a few administrations, including extensive or focused taking drugs audits; training for patients, families, and staff; and arrangement of medication data [3].

Figure 2. The symptoms of a MRPs with the elderly patients. MRPs is the fourth leading cause of death in the elderly and can also cause disability, depression, gait disturbances, and falls. Some of the factors for increasing the risk of MRP in elderly are suboptimal prescribing (e.g. over use of medications, polypharmacy, inappropriate use, and under use), medication errors (both dispensing and administration problems), patient medication nonadherence (both intentional and unintentional), and multiple medications. These problems are considerably increase the cost of health care system. The adverse drug effects in the elderly population can be reduced and perhaps prevented by the physician anticipating the effects of drug toxicity and understanding how the patient's age and health status will likely affect drug dosing (Ramanath K, Nedumballi S. Assessment of medication-related problems in geriatric patients of a rural tertiary care hospital. J Young Pharm. 2012;4(4):273-8).

2.2. Common MRPs and Success of Pharmacy Visits at Home

Traditionally, nursing homes have been associated with suboptimal drug therapy and MRPs. In contrast, less is known about drug safety in homecare. Significantly more MRPs were detected among patients receiving home nursing care than patients living in nursing homes. While patients living in nursing homes were often undermedicated, documentation discrepancies were more frequent in home-nursing care. MRP categories leading to changes on the medication lists differed between the settings.

- Untreated conditions: The patient has a medical condition that requires drug therapy but is not receiving a drug for that condition.
- Drug use without indication: The patient is taking a medication for no medically valid
A condition or reason. For example, a client may be taking proton-pump inhibitor although he or she does not have a history of gastroesophageal reflux disease or peptic ulcers. Conversely, a client with hypertension and diabetes mellitus may not be taking aspirin, although he or she has an indication for it.

- **Improper sedate determination**: The patient's medical condition is being treated with the wrong medication or a medication that isn't the most fitting for the patient's uncommon needs.
- **Subtherapeutic measurements**: The patient has a medical issue that is being treated with excessively little of the right prescription.
- **Overdosage**: The patient has a medical issue that is being treated with a lot of the right prescription.
- **Effectiveness**: Effectiveness-related issues happen when a medicine portion is excessively low or when a progressively compelling medication is accessible. For instance, a patient with unending torment might take acetaminophen when a narcotic might be progressively successful.
- **ADRs**: The patient has a medical condition that is the aftereffect of an unfriendly medication response or unfavorable impact. On account of more established grown-ups, unfavorable medication responses add to officially existing geriatric issues, for example, falls, urinary incontinence, clogging, and weight reduction.
- **Safety**: When a customer is taking a medicine with a portion that is excessively high or is taking a prescription that causes an unfriendly medication response, the person in question is encountering a security drug related issue. For instance, a customer will be unable to take amitriptyline for a sleeping disorder since anticholinergic symptoms are excessively troublesome.
- **Drug connections**: The patient has a medical condition that is the aftereffect of a medication cooperating adversely with another medication, nourishment, or research center test.

- **Compliance**: The patient has a medical condition that is the aftereffect of not getting a prescription because of monetary, mental, sociological, or pharmaceutical reasons. Compliance-related problems describe instances when a client prefers not to take a medication, does not understand how to use a medication, or cannot afford a medication. A client is experiencing a compliance-related problem if he or she does not understand how to use an inhaler or prefers not to take a medication to treat a condition [1], [4], [5].

The core of the PATCH service is the ability of pharmacists to provide comprehensive patient-centered care by identifying MRPs and making evidence-based recommendations to providers to optimize medication use. MRPs have been estimated to cost approximately $177.4 billion per year and are estimated to be one of the top 5 causes of death in the elderly population. Identifying, resolving, and preventing MRPs can lead to cost savings as well as improved patient outcomes [6]. Traditionally, the availability of clinical pharmacy services has been in the purview of hospitals where increased clinical pharmacy services has been associated with reduced length of stay and mortality. Acknowledgment of the estimation of the job of the pharmacist has brought about development of clinical administrations into outpatient settings, including quiet homes. For instance, the HMR program that was built up in Australia in 2001 gives financing to pharmacists to visit patients at home to survey their drug regimens. In Canada, commonplace governments are repaying pharmacists for giving prescription audits (MRs) for non-hospitalized patients and furthermore approving pharmacists to endorse [7].
Figure 3. Pharmacist involvement in Post-discharge warfarin management. In the post-discharge setting, a RCT of home visits and point-of-care (POC) INR testing by a pharmacist improved the initiation of warfarin therapy and resulted in a significant decrease in hemorrhagic complications in the first 3 months of therapy. The objective of this trial is to develop and implement a sustainable program to enable the smooth transition of both newly anticoagulated patients and those already taking warfarin from the hospital to community setting. An HMR involves the patient, after referral by their GP, being visited at home by an ‘accredited’ pharmacist who reviews their medication regimen, delivers education and provides the GP with a report and management suggestions. The GP and patient then agree on a medication management plan. The process is facilitated by the patient’s regular community pharmacist, which further assists in the development of cooperative working relationships between the members of the patient’s healthcare team. Based on the excellent results of the previously trial program, this service has been proposed as a potential solution to many of the issues faced in the post-discharge period by patients taking warfarin. The aim is to incorporate POC INR monitoring and warfarin education into the existing HMR remuneration structure to produce a streamlined and sustainable model more pragmatic for widespread implementation into practice (Source: Stafford et al.: A role for pharmacists in community-based post-discharge warfarin management: protocol for the ‘the role of community pharmacy in post hospital management of patients initiated on warfarin’ study. BMC Health Services Research 2011 11:16. doi:10.1186/1472-6963-11-16).
Figure 4. The Pharmacist Advancement of Transitions of Care to Home (PATCH) model, developed by CDC in 1983. PATCH was created for application among diverse partners at the local level, but also within the context of vertical collaboration within the governmental public health infrastructure (federal, state, and local levels) and horizontal collaborations with voluntary organizations, academia, and other partners at all levels. PATCH has five critical elements or phases. (1) community member participation, (2) data-based program development, (3) collaborative development of a comprehensive health promotion strategy, (4) evaluation for feedback and improvement, and (5) the enhancement of community capacity for health promotion. Although PATCH encourages the active engagement of local governmental health agencies, it recognizes that these may not always be the "most appropriate and/or effective focal point for PATCH" and "primary care clinics, university groups, businesses, and other nongovernmental organizations may be in a better position to exercise leadership for a PATCH program" with the support and facilitation of the local health agency. The implementation of PATCH highlighted several elements that seem to be associated with successful community-based public health planning and action. These include the existence of a core of community support and participation, data collection and analysis, setting of objectives and standards to help with planning and evaluation, the adoption of multiple strategies on multiple fronts, sustained monitoring and progress evaluation to fine-tune projects, and the support of the governmental public health infrastructure nationally and locally (Institute of Medicine (US) Committee on Assuring the Health of the Public in the 21st Century. The Future of the Public's Health in the 21st Century. Washington (DC): National Academies Press (US); 2002. B, Models for Collaborative Planning in Communities. Available from: https://www.ncbi.nlm.nih.gov/books/NBK221247/)

3. Residential Care Pharmacists into Aged Care Homes

Endorsing in the private matured care populace is perplexing, and requires continuous survey to avert medicine misfortune. Coordinating an on
location clinical pharmacist into private care groups is an unexplored chance to enhance quality utilization of drugs in this setting. Pharmacist-drove drug audit is viable in decreasing prescription related issues; be that as it may, current financing plans explicitly bar pharmacists from routinely taking an interest in inhabitant care [8].

Figure 5. Pharmacovigilance in Polypharmacy issues in elderly. The Slone Survey reported that 60% and approximately 20% of elderly patients in the US receive more than five and 10 or more medicines, respectively. Consequently, polypharmacy is common among the elderly. Polypharmacy is related to increased risk of being administered PIM. Other PIM criteria including STOPP/START have been used. These criteria are suitable for determining the appropriateness of prescriptions. The STOPP and START tools identify inappropriate medications in elderly, including drug-drug and drug-disease interactions, drugs that increase the risk of falls, and drugs that duplicate therapy. The Beers and STOPP tools are used to address over- and misuse of medications. The START tool allows the detection of potentially inappropriate drug omissions (Source: Abe J, Umetsu R, Uranishi H, et al. Analysis of polypharmacy effects in older patients using Japanese Adverse Drug Event Report database. PLoS One. 2017;12(12):e0190102. Published 2017 Dec 21. doi:10.1371/journal.pone.0190102).

3.1. Medication Use in Older Adults
Prescribing in the older population is highly complex. Age-related pharmacokinetic and pharmacodynamic changes lead to variations in drug bioavailability, increased drug sensitivity, and decreased regulatory mechanisms, altering the effects of drug usage from those observed in younger populations. In addition, the presence of multiple co-morbidities necessitating multiple medication usage equates to an increased risk of medication misadventure in older adults. Advancing age is
positively correlated with increased prevalence of chronic disease, and increased number of co-morbidities correlates with increased medication use [9-13]. ADEs can significantly impair occupational and cognitive functioning, and quality of life. All medications have the potential to cause an ADE, particularly in older adults, as a result of pathophysiological decline, inappropriate polypharmacy, and involvement of multiple health providers. This can worsen cognitive impairment, frailty, disability, frequency of falls, and mortality [12,13].

3.2. Transitions of Care and ADEs
Changing into matured care has been recognized as an especially high-chance point where inhabitants are defenseless against drug mistakes and ADEs. Advances of care for occupants incorporate new affirmation from the network or medical clinic to a RACH, or coming back to the RACH post-release from emergency clinic. Clumsy care advances and miscommunication can result in intruded on coherence of care and unfriendly occasions, which may prompt improper re-admission to medical clinic or introduction to crisis offices. A study shows Hypertension (nearly 50%) was the highest prevalent chronic disease among the study participants followed by osteoarthritis (35%), diabetes mellitus (more than 25%), respiratory disorders (14%) and cerebro-vascular accidents (11%) in old-age homes of Malaysia. Roughly 20% of inhabitants encounter a noteworthy postponement in drug organization and missed dosages following affirmation or re-admission to a RACH. Change related prescription blunders are seen in 13–31% of RACH inhabitants, frequently include high hazard drugs, for example, warfarin, insulin, psychoactive operators, and narcotics, and have more serious danger of making genuine damage the occupant [14-17].

Figure 7. Schema of the medicine reconciliation process at admission and discharge. This includes all prescribed medicines, nonprescription and OTC products. It is an opportunity to discuss with the patients their adherence, including questioning if they have any swallowing...
difficulties or issues such as being unable to open containers or remove the tablets from the blisters, and if they are experiencing any adverse effects from their medicines, which may be affecting their adherence. Research has shown that for patients in hospital, a quarter of medication errors can be directly attributed to reconciliation of medications taken prior to admission not being completed. An unintentional change to regular medications is considered a discrepancy as is an intentional change that has not been documented in the patient medical record. Every patient should have their medications reconciled on admission by a pharmacist, but often in the hospital setting, due to the pressure on pharmacy resources, a prioritization system is required to reconcile patients who are considered to be at higher risk for medication errors (Nicholls J, MacKenzie C, Braund R. Preventing drug-related adverse events following hospital discharge: the role of the pharmacist. Integr Pharm Res Pract. 2017;6:61-69. Published 2017 Feb 13. doi:10.2147/IPRP.S104639).

3.3. Communicable Disease Prevention
Five most common infections in the elderly are UTIs, GI infections, Bacterial pneumonia and influenza. Viral infections like herpes zoster (shingles), pressure ulcers, bacterial or fungal foot infections (which can be more common in those with diabetes), cellulitis, drug-resistant infections like MRSA are common skin infections. More than 60% of seniors over 65 get admitted to hospitals due to pneumonia, reported by AAFP (underlying causes are changes in lung capacity, increased exposure to disease in community settings, and increased susceptibility due to other conditions like cardiopulmonary disease or diabetes). Influenza and pneumonia combined add up to the sixth leading cause of death in America — 90% of these in senior adults. Weakened immunity in the elderly, along with other chronic conditions, increases the risk of developing severe complications from influenza, such as pneumonia. Because influenza is easily transmitted by coughing and sneezing, the risk of infection increases in a closed environment like a nursing home. Cough, chills and fever are the common symptoms, though, again, influenza may present different signs in older adults. Influenza is generally preventable through yearly inoculation, and there is adequate proof to help RACH staff immunization to shield inhabitants from flu. The reasonable for this is to enhance openness to the inoculation for individuals from the network who experience issues getting to the antibody through their GP or business, as drug stores are regularly open later and on ends of the week [18-21].

4. Terminal/Palliative Care
Palliative care in U.S. hospitals increasing every year, according 2018 Palliative Care Growth Snapshot issued by the CAPC. The predominance of medical clinics (at least 50 beds) with a palliative care group expanded from 658 to 1,831—a 178% expansion from 2000 to 2016 [22]. Also, By 2056, 480,000 Canadian deaths for every year are anticipated with 90% of those deaths being qualified for palliative care [23]. Patients determined to have a terminal ailment regularly require nonstandard portions that are not accessible financially, so pharmacists thinking about hospice patients may need to compound items to meet individual patients’ one of a kind needs [24,25]. This may incorporate planning arrangements that are seasoned to conquer unfortunate qualities or delivering measurement shapes with elective fixings as well as excipients to maintain a strategic distance from hypersensitive responses or dynamic prejudices. Pharmacists can frequently suggest dosing gadgets that assistance patients and caregivers convey the correct portion of exceedingly powerful drugs. Such gadgets may not generally be promptly accessible to patients in the network.
4.1. Medication Dispensing for Terminal/Palliative Care

Most palliative pain medications are controlled substances and are registered among the most highly controlled Schedule II drugs. IAHPC identified 21 symptoms and included 33 essential medications for control of these symptoms. In addition, according to a recent study based on international expert consensus opinion, four essential drugs were used for alleviation of anxiety, dyspnea, nausea and vomiting, pain, and respiratory tract secretions, as well as terminal restlessness. These include morphine, midazolam, haloperidol, and an antimuscarinic, which should be offered in the last 48 hours of life for patients with cancer [26,27]. Futile medication use in management of terminally ill cancer patients has also been reported, one-fifth of cancer patients at the end of their life took futile medications. Statins met futility criteria in 97% of cases, gastric protectors in 50%, antihypertensive agents in 27%, antidiabetic prescriptions in 1%, bisphosphonates in 26%, and antidementia drugs in 100% of patients. Unlike chemotherapy, there is no framework in place to validate halting radiation therapy either in the name of overutilization or futility [28,29].

4.2. Non-Traditional Administration Routes

Elective organization courses for palliative care are crucial to giving viable patient care. Numerous regularly endorsed medications (eg, promethazine, morphine sulfate) might be utilized in nontraditional courses [30]. Topical gels containing metoclopramide, diphenhydramine or lorazepam may found worthwhile for patients with unmanageable sickness and spewing [31,32]. Usually recommended drugs can have nontraditional utilizations and rectal bioavailability, for example, carbamazepine/Topiramate/Lamotrigine tablets or suspension for spasms; rectal use may permit fast ingestion and halfway maintain a strategic distance from first-pass digestion because of rectal venous deplete [33]. In the event that essential, medications can be intensified into parenterals, arrangements, creams, balms, and transdermal measurements details to enhance quiet adherence and improve AEs, for example, stoppage, queasiness, gastrointestinal issues, and sedation [34]. Different measurement frames, including transdermal patches of scopolamine and terminal infusions of octreotide, are utilized to treat explicit requirements of individual patients [35].

Exhibit 1. Alternate routes to oral opioid administration [74]

<table>
<thead>
<tr>
<th>Route</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intravenous</td>
<td>Widely used and accepted by clinicians and patients</td>
<td>May have limited availability, especially in home/nursing home settings</td>
</tr>
<tr>
<td>Enteral</td>
<td>Morphine is compatible with enteral feedings at temperatures from 22 to 50°C</td>
<td>Enteral drug practices vary widely leading to frequent medication errors, including crushing sustained-release tablets and failure to flush the tube before administering medication</td>
</tr>
<tr>
<td>Subcutaneous</td>
<td>Flexible, results in morphine levels equivalent to IV route, availability of SC access sites is virtually unlimited</td>
<td>SC route should be avoided or used with caution in immunocompromised patients and in those patients with bleeding disorders</td>
</tr>
<tr>
<td>Transdermal patches</td>
<td>Ease of administration</td>
<td>Local irritation can occur at patch site</td>
</tr>
<tr>
<td>Intranasal (excluding nebulized medications)</td>
<td>Convenient, rapid onset of action, no hepatic first-pass metabolism</td>
<td>Nasal congestion and local irritation, URIs, change in naso-ciliary function</td>
</tr>
<tr>
<td>Sublingual</td>
<td>Simplicity, rapid onset of action for highly lipophilic drugs (e.g., fentanyl and methadone)</td>
<td>Hydrophilic drugs such as morphine and hydrocodone are poorly absorbed sublingually, bitter taste and burning sensation possible</td>
</tr>
<tr>
<td>Buccal</td>
<td>Simplicity, rapid onset of action for highly lipophilic drugs (e.g., fentanyl and methadone)</td>
<td>High unit price may make branded formulations prohibitively expensive in capitated reimbursement systems (e.g., hospice)</td>
</tr>
<tr>
<td>Rectal</td>
<td>Simplicity, useful in patients with nausea and vomiting or those with dysphagia, GI obstruction, malabsorption, or impaired neuromuscular function</td>
<td>Bioavailability can be affected by multiple factors, including the small surface area of the rectum, insufficient fluid to dissolve tablets or capsules, and presence of feces that can limit absorption</td>
</tr>
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</table>

4.3. Gastrointestinal Issues
Gastrointestinal issues may develop secondary to many chronic conditions (e.g., advanced cancer, neurologic disorders) [36]. Constipation is a standout amongst the most well-known issues patients involvement with the finish of life. The reason can be as straightforward as dietary modifications or the powerlessness to ambulate or work out. Extreme inconvenience and torment from stoppage may course into a persistent decrease in a patient's personal satisfaction, requiring pharmacologic mediation. Security issues amid toileting and the powerlessness to finish poop without help may advance as a perpetual sickness declines, with the extent of individuals with extreme issues expanding as death approaches [37]. Pharmacists can have a vital impact in anticipating and dealing with the side effects of blockage, for example, enteral check, drying out, loss of craving, versatility issues, and drug AEs. Numerous non-pharmacologic methodologies (e.g., dietary changes, evasion of negative natural boosts, conduct estimates, for example, unwinding) may help patients without adding to the pharmacologic weight [38].

4.4. Individualized Care or PCC
The point of palliative care is to enhance the personal satisfaction of patients and families through the anticipation and help of anguish. Palliative care in the home is the arrangement of specific palliative consideration in the patient’s home, regularly given by attendants as well as doctors with or without association with a doctor's facility or hospice. In a study of 1200 Canadians, more prominent than 70% of respondents wanted to be at home close demise [39]. Since palliative consideration regimens are very individualized to address every patient’s issues, coordinating a pharmacist into the interdisciplinary group is fundamental to accomplishing a patient's consideration objectives. Body energy and volume of circulation are changed in patients in end-of-life care.

4.5. Role of The Caregivers
Home care clinicians in the WRHA currently rely on community pharmacists for assistance with medication-related issues. According to NCCN “Palliative care specialists and interdisciplinary palliative care teams, including board-certified palliative care physicians, advanced practice nurses, and physician assistants, should be readily available to provide consultative or direct care to patients/families who request or require their expertise,” [40]. Pharmacists have an exceptional learning base for improving patient consideration while diminishing AEs and toxicity [23], [41]. Palliative care utilizes a group approach, including doctors, medical attendants, social laborers, pastors, and pharmacists. The pharmacist’s job inside palliative care groups is expanding and introductory great results have been accounted for. Investigation of patients with known date of first pharmacist visit found altogether enhanced LOS, LTC, and CTD for patients with early access to palliative pharmacy (notwithstanding alternate individuals from the palliative group) contrasted with those without early access [42]. Network drug stores are recommended to
consider stocking the five "fundamental" palliative care drugs: clonazepam 1mg/ml, morphine 10mg/ml, haloperidol 5mg/ml, metoclopramide 10mg/2ml, and Hyoscine butylbromide 20mg/ml [43,44]. Know About Caring for Children According to the Picker Institute and Harvard Medical School has delineated following dimensions of patient-centered care, including:

- Respect for the patient's values, preferences, and expressed needs
- Information and education
- Access to care
- Emotional support to relieve fear and anxiety
- Involvement of family and friends
- Continuity and secure transition between health care settings
- Physical comfort
- Coordination of care [45]

<table>
<thead>
<tr>
<th>Exhibit 2. Goals of care for patients in the dying phase</th>
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<tbody>
<tr>
<td><strong>Comfort measures</strong></td>
</tr>
<tr>
<td>▪ Current medication assessed and non-essentials discontinued</td>
</tr>
<tr>
<td>▪ As required subcutaneous drugs written up according to protocol (pain, agitation, respiratory tract secretions, nausea, vomiting)</td>
</tr>
<tr>
<td>▪ Discontinue inappropriate interventions (blood tests, antibiotics, intravenous fluids or drugs, turning regimens, vital signs); document not for cardiopulmonary resuscitation</td>
</tr>
<tr>
<td><strong>Psychological and insight issues</strong></td>
</tr>
<tr>
<td>▪ Ability to communicate in English assessed as adequate (translator not needed)</td>
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<tr>
<td>▪ Insight into condition assessed</td>
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<tr>
<td><strong>Religious and spiritual support</strong></td>
</tr>
<tr>
<td>▪ Religious and spiritual needs assessed with patient and family</td>
</tr>
<tr>
<td>▪ Communication with family or others</td>
</tr>
<tr>
<td>▪ Identify how family or other people involved are to be informed of patient's impending death</td>
</tr>
<tr>
<td>▪ Family or other people involved given relevant hospital information</td>
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<tr>
<td><strong>Communication with primary healthcare team</strong></td>
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<tr>
<td>▪ General practitioner is aware of patient's condition</td>
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<tr>
<td>▪ Plan of care explained and discussed with patient and family</td>
</tr>
<tr>
<td>▪ Family or other people involved express understanding of plan of care</td>
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* Adapted from the Liverpool care pathway for the dying patient—initial assessment

4.6. Clinicians Involved in PPC

Palliative care clinicians are also called to assist with pediatric-aged patients. The PPC team includes multiple disciplines, community-based resources, and family members. Due to advancing technology and medical expertise, children are living longer and with greater medical complexities. Accurate prognostication in pediatrics is complicated by the lack of empirical research and heterogeneous medical experiences. Understanding a family’s narrative about their child’s illness and their definition of quality of life is essential for effective goals of care discussions. Children are not small adults. Developmental differences among infants, children, and adolescents that affect diagnosis, prognosis, treatment strategies, communication, and decision-making processes present challenges to adult providers who do not have training or experience in caring for children. Most symptoms for pediatric patients can be managed analogous to that of adult patients; however, complex neurologic symptoms and feeding difficulties are prevalent and distinct in pediatric population. Families of pediatric patients often choose to accept the burdens involved in the use of life-sustaining technology for the benefit of a longer life for their child. Children develop increasing decision-making capacities as they get older.
and should have increasing roles in healthcare decisions. Their understanding of illness and death evolves over time [46,47]. NHPCO’s Quality Partners program utilizes the Standards of Practice as its foundation to provide a framework for quality assessment and performance improvement.

5. Transition of Care: Issue of Collaboration

Improving medication management during care transitions will require 3 main initiatives. First, the patient must remain the central focus of care. Second, interprofessional communication and collaboration need to occur among all providers involved in the health care of individual patients. Third, the outcomes of pharmacist involvement during care transitions needs to be evaluated systematically (ideally in controlled trials) to demonstrate a cost-effective improvement in quality and to provide financial justification for investing in pharmacist resources. Collaboration between hospital and community pharmacists can also facilitate patient-centered care. Multiple medication changes during hospitalization can be confusing to patients, caregivers, and providers, and can lead to medication errors. Hospital pharmacists can provide a reconciled medication list and meet with patients for counseling and education. Typically, the day of discharge is busy, and patients have limited time and attention to discuss important issues. A “hand-off” or pharmacist discharge care plan could facilitate the coordination of medication management between the hospital and community pharmacist. This provides continuity so that the community pharmacist has a list of actual or potential medication-related problems to follow-up on with the patient or other health care providers. It also provides the community pharmacist with patient information that they would not normally have access to [48]. Resources should be targeted toward patient populations at increased risk for readmission, such as patients with heart failure, COPD, asthma, advanced age (discussed earlier), low health literacy, and frequent hospitalizations (FEs).

5.1. Heart Failure Management

Network pharmacists who grow their jobs and make home visits to heart disappointment (HF) patients after medical clinic release can enhance results. Home human services groups once in a while incorporate pharmacists when they give care to patients experiencing advances in care. HF influences roughly 6 million grown-ups in the USA, with more than $30 billion in related yearly expenses; by 2030, these figures are required to ascend to in excess of 8 million grown-ups and more than $69 billion. From 2012 to 2014, the age-balanced rate of HF-related deaths per 100,000 individuals expanded from 81.4 to 84.0. The effect of pharmacist intercession was assessed in a pharmacy-drove TOC program for patients with HF from a US clinic. The objective of TOC is to help as of late released patients keep away from pointless medical clinic and crisis room re-affirmations while guaranteeing speedy mending and recuperation comfortable. Their primary functions are in-home medical care, collaboration and communication with patient’s primary care provider, specialist and discharging hospital, discharge summary review, lab testing & diagnostic imaging, medication reconciliation & adherence etc. Admission medication reconciliation and discharge medication review were performed to monitor for appropriateness and dosing, duplications, omissions, and drug interactions. Pharmacy-led TOC increased compliance with HF core measures (including appropriate medication use) and reduced HF readmissions, 30-day readmissions, all-cause readmissions, and costs [49-51].

<table>
<thead>
<tr>
<th>Exhibit 3. SIMPLE approach to identify compliance barriers during discharge and to improve adherence [50]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simplify the regimen</td>
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5.2. COPD Management

COPD, the fourth leading cause of death worldwide, is also a major cause of chronic morbidity all over the world, particularly in developing countries. In 2016, it was the third leading cause of years of life lost and disability-adjusted life-years in the United States, with an estimated 164,000 deaths. Indeed, in 2012, more than 3 million people worldwide died of COPD, equating to 6% of all deaths globally in that year. In the UK, the costs associated with COPD are estimated to exceed £800 million. In the USA, more than 26 million people are estimated to have COPD but almost half of these are undiagnosed. The significance of effective COPD exacerbation management is critical to managing healthcare resources. Clinical improvement depends on many factors such as drug selection, patient compliance and control of other risk factors including the environment and nutrition. Patients at risk for having an exacerbation of COPD should receive self-management strategies. Prompt therapy prior to exacerbations reduces hospital admissions and readmissions, speeds recovery, and slows disease progression. COPD patients tend to have better medication adherence with pharmacist counseling, subsequently improving their quality of life as well as clinical outcomes. Direct education by pharmacists has been shown to be more effective than other teaching methods, including watching videos and providing inhaler pamphlets. With increasing number of COPD patients, individualized counseling for patients is a challenge to the limited number of physicians. Incorrect use of inhalers is very common and subsequently leads to poor control of COPD. Pharmacist-led comprehensive inhaler technique intervention program using an unbiased and simple scoring system can significantly improve the inhaler techniques in COPD patients. A 3-month combined program of transition and long-term self-management support resulted in significantly fewer COPD-related hospitalizations and emergency department visits and better HRQL at 6 months after discharge [52-58].

Exhibit 4. Frequent Hospitalization and Risk of AECOPD [59]

Frequent exacerbations (FEs) imply that the illness is advancing quicker, expanding the danger of intense re-compounding and mortality. Late investigations demonstrated that ≥2 occasions/year of AECOPD or ≥1 occasion/year of AECOPD prompting hospitalization was the hazard factor for future worsening occasions. The COPDGene think about demonstrated that divider thickness and emphysema were engaged with AECOPD and were free of wind current confinement. Among others, divider thickness and EI, two imaging highlights, are very much acknowledged pointers mirroring the obsessive changes of COPD. Exacerbation hospitalizations in the past year and EI were independently associated with hospitalization. A cohort study shows that with the increase in the number of hospitalizations, the risk of acute exacerbation and death increased in turn.

5.3. Hip/Knee Arthroplasty

THA and TKA, collectively known as TJA, are beneficial and cost-effective procedures for patients with symptomatic osteoarthritis. The US health care system is the costliest in the world – accounting for 17% of GDP – estimates
that percentage will grow to nearly 20% by 2020. TJA is the single largest cost in Medicare, with reports showing a $13.43 billion annual price tag for THAs, and a $40.8 billion annual price tag for TKAs. 20% of readmissions occur due to a medication error, 60% of all medication errors occur during times of care transitions. The most common cause of unplanned readmission at both 30 and 90 days post-THA were joint-specific reasons, including dislocation and joint malfunction. The second and third most common causes for unplanned readmission, again at both 30 and 90 days, were surgical sequelae and thromboembolic disease, followed by surgical site infection. The pharmacologic intervention directly related to the procedure post-surgery is often limited to pain management (most commonly opioid analgesics). Unlike chronic disease management, the effect of proper pain management - might tends to be more tangible to the patient. When non-adherent to the pain management regimen, the resulting symptoms tend to be incentive enough for the patient to become adherent until the operative pain is resolved permanently [60-64].

5.4. Transitional Care Needs of LHL in Hospitalization

Hospitalization represents a crucial care transition point for patients with exacerbations of chronic disease, in which patient education can aid in improving disease management and reducing negative health outcomes after discharge, such as readmissions and discharge medication errors. Resources may be limited for in-hospital patient education, so triaging by HL level may be necessary for resource-optimization. LHL affects approximately 30% to 60% of adults in the US, Canada, Australia, and the EU. Screening for inadequate health literacy and associated needs may enable hospitals to address these barriers and improve post-discharge outcomes. Health literacy is associated with many factors that may affect successful navigation of care transitions, including doctor-patient communication, understanding of the medication regimen, and self-management. Research has also demonstrated an association between low health literacy and poor outcomes after hospital discharge (misunderstanding discharge instructions, poor self-rated health, self-efficacy, and decreased use of preventative services), including medication errors, 30-day hospital readmission, and mortality. Potential ADEs are also common and arise from unintentional discrepancies between admission and discharge regimens, such as changes in dose, route, or frequency, and/or introduction of new medications. Transitional care initiatives have begun to incorporate health literacy into patient risk assessments and provide specific attention to low health literacy in interventions to reduce adverse drug events and readmission. Patients – particularly those with limited health literacy – found a hospital pharmacist-based intervention to be very helpful and empowering. The PILL-CVD study consisting of pharmacist-assisted medication reconciliation, inpatient pharmacist counseling, low-literacy adherence aids, and individualized telephone follow-up, on the number of clinically important medication errors after hospital discharge suggested more involvement of pharmacists and opportunities for better outcome [65-69].

5.5. Prevention of Hospital Readmissions

Most common cases of hospital readmissions in US are heart failure, heart attack, and pneumonia, hip and knee replacements, exacerbations of COPD; heart bypass. The penalties were capped at 1% of Medicare reimbursements in 2013, 2% in 2014, and 3% in 2015. The administration assesses that the punishments for financial year 2015 will add up to $424 million and influence 2,638 emergency clinics, speaking to a normal punishment of more than $160,000 per medical clinic. About 20% more established grown-ups are readmitted to a medical clinic inside 30 days of release. Given that the greater part of these readmissions is preventable, the new punishments are convincing emergency clinics
to make the decrease of readmissions a need. The people group contact pharmacist gives the missing connection between clinic care and the home, just as among various human services suppliers, in this manner limiting admission to the emergency clinic because of medicine blunder and advancing proper portion of social insurance assets. Also, people group pharmacists, the medicinal services experts who have the most collaboration with patients’ post-release, are frequently underutilized. Being an indispensable piece of the change of care process, pharmacists can demonstrate their incentive as well as push the pharmacy calling toward being perceived as containing social insurance suppliers. Network contact programs obviously help lessen medical clinic readmissions and different sorts of mischief and squandered assets related with preventable unfavorable medication occasions. [69-72].

Figure 8. The Health Literacy Pathway Model. The model includes five stages along a pathway; each stage requires a more complex set of health literacy abilities. As participants progress through each stage, they develop their health literacy further and gain the opportunity to feel more empowered. Health literacy processes are represented in the five stages of the Pathway Model and health literacy outcomes are represented as running parallel to those stages. Longitudinal qualitative analysis of how participants’ developed and used their health literacy skills to become more active and empowered patients enabled us to map a set of stages that participants progressed through as they increased their knowledge and understanding of their condition, learned how to manage it, actively participate in discussions with health professionals, and make informed self-management and treatment decisions. Progression through these stages is presented in a theoretical model mapping a health literacy pathway from health knowledge towards decision-making (Source: Edwards M, Wood F, Davies M, Edwards A. The development of health literacy in patients with a long-term health condition: the health literacy pathway model. BMC Public Health. 2012;12:130. Published 2012 Feb 14. doi:10.1186/1471-2458-12-130)
### Exhibit 5. Summary of learnings and Proposed Actions for Collaboration in ToC [73]

<table>
<thead>
<tr>
<th>Learnings</th>
<th>Proposed Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased empathy towards older people and the limitations and difficulties they may face during the discharge process;</td>
<td>• More empathetic approach: establishing a relationship with the patient early on and being person-centered and sensitive to older people's needs</td>
</tr>
<tr>
<td>• Greater understanding of the multidisciplinary team and the roles and difficulties faced by other professionals involved in the process of care transitions home;</td>
<td>• Increased involvement of patients and families in planning care transitions</td>
</tr>
<tr>
<td>• The importance of good interprofessional collaboration across the professions and the sharing of information;</td>
<td>• Improved communication and interprofessional collaboration across the care settings</td>
</tr>
<tr>
<td>• The factors that promote a successful care transition;</td>
<td>• Ensure there is clarity about who is responsible for different roles and actions during care transitions and ensure that each health professional feels valued</td>
</tr>
<tr>
<td>• The personal and communication skills needed for working with older people with complex needs.</td>
<td>• Be more proactive: anticipate problems and have back-up plans</td>
</tr>
<tr>
<td></td>
<td>• Educate colleagues about care transitions home e.g. ensure inclusion in junior staff induction</td>
</tr>
<tr>
<td></td>
<td>• Reflect on what has worked in care transitions and what could have been improved</td>
</tr>
<tr>
<td></td>
<td>• Apply their increased understanding of consent and mental capacity to care transitions</td>
</tr>
<tr>
<td></td>
<td>• Apply their increased awareness of local processes for care transitions and documentation</td>
</tr>
</tbody>
</table>

### Conclusion

Community pharmacists are among the most accessible front-line primary care practitioners and are well positioned to affect the care of homebound patients. Pharmacist-directed home medication reviews offer an effective mechanism to address the pharmacotherapy issues of those members of the community who are most in need but may otherwise lack access to pharmacy services. As the general population ages, the demand for such services will undoubtedly increase. Pharmacist-directed home medication reviews could serve to minimize inappropriate use of medication, maximize health care cost savings and expand the scope of pharmacy practice.

### Article Summary

*The arrangement of home care has existed since the turn of the only remaining century, when societal concerns with respect to migration, industrialization, and irresistible infections brought forth the requirement for visiting medical attendants. Early homecare services primarily consisted of midwife and nursing assistance for births, and the care of influenza and tuberculosis patients. This early form of home care paved the way for the development of alternate site healthcare. In the past, the term home care generally referred to community-based nursing services provided to patients in their homes. Today, the term has been expanded to include home/alternate site healthcare and encompasses: long-term care, and skilled nursing facilities, assisted living and subacute facilities, home care, diagnostic centers, outpatient clinics, ambulatory surgery, rehabilitation facilities, and emergency service markets.*

### Abbreviations

Medicines Optimization in Care Homes (MOCH); Medication-related problems (MRPs); Residential Aged Care Home (RACH);
Methicillin-resistant Staphylococcus aureus (MRSA); American Academy of Family Physicians (AAFP); International Association for Hospice and Palliative Care (IAHPC); Center to Advance Palliative Care (CAPC); Patient Centered Care (PCC); Length Of Stay (LOS), Length From Admission To Palliative Care Consult (LTC), Consult To Discharge Or Death (CTD); National Comprehensive Cancer Network (NCCN); Pediatric Palliative Care (PPC); National Hospice and Palliative Care Organization’s (NHPCO); Winnipeg Regional Health Authority (WRHA); Pharmacist Advancement of Transitions of Care to Home (PATCH); Home Medicines Review (HMR); Transition of Care (ToC); Chronic obstructive pulmonary disease (COPD); Acute Exacerbation of COPD (AECOPD); Low Health Literacy (LHL); Pharmacist Intervention for Low Literacy in Cardiovascular Disease” (PILL-CVD); Health-Related Quality of Life (HRQL); Heart failure (HF); Frequent Exacerbation (FEs); Emphysema Index (EI); Total Hip Arthroplasty (THA); Total Knee Arthroplasty (TKA), Total Joint Arthroplasty (TJA); Potentially Inappropriate Medications (PIM); Screening Tool Of Older People’s Prescriptions (STOPP) Screening Tool To Alert Doctors To Right Treatment (START)

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