Literature Review

V. Kalaiselvan, SakshiGakhar, et al (2011) ; In India, spontaneous reporting of adverse drug reactions (ADRs) by healthcare professionals was initiated in 2010. The drug safety issues for geriatric population are critical due to age-related physiological changes, pharmacodynamics and pharmacokinetics changes.

M Shamma C Dilip, et al (2013) ; Adverse drug reactions are recognized hazards of drug therapy and they can occur with any class of drug and many studies revealed that incidences are more in case of antibiotics. The aim of this study was to detect and analyze adverse drug reactions of antibiotics in patient of tertiary care hospital.

Nimmy. N. John and N. Akshay Kumar (2013); Geriatrics is the branch of medicine which aims to promote health by preventing and treating diseases and disabilities in older adults. Elderly people particularly are subjected to have multiple medical disorders; some have self-prescribed many herbal medications and over-the-counter drugs; some adult physicians prescribe medications to their specialty without reviewing other medications used by the elder patient. This polypharmacy may result in many drug interactions and may cause some adverse drug reactions. So the main objective of our study was to assess the polypharmacy and inappropriate medication usage in geriatric population.

AYESHA ROMANA, LAXMINARAYANA KAMATH, et al (2012); Polypharmacy is a common occurrence in elderly patients due to reasons like multiple co-morbidities and multiple prescribing physicians. The present study was designed to identify the adverse drug reactions occurring in the elderly as a result of polypharmacy and also to assess the rationality of prescription based on World Health Organization (WHO) criteria and Beer’s criteria. This study was conducted at Victoria hospital attached to Bangalore Medical College and Research Institute. Hundred patients aged ≥60 years and prescribed more than 5 drugs were included in the study. The analysis of data revealed, the number of drugs per prescription was 8.42±2.4. Of the total 842 drugs prescribed, number of drugs prescribed by generic name was 36 (4.27%) and number of drugs prescribed from WHO model list of essential medicine was 444 (52.7%).

S Sandhiya, C Adithan ; Life span of humans has increased in the recent years due to social, economical and health care improvement. Medical society has identified persons aged over 65 as elderly while those above 75 as geriatric population. By 2050 the worldwide elderly population is expected to reach 1.4 billion which means that one out of ten people will be more than 65 years of age. Currently population aging is most serious in Europe and Japan. China is expected to have an increase in the proportion of elderly people by next century. The present elderly population in India is over 77 million, constituting 7.7% of the total population and is expected to rise to 100 million by 2013.1

Alessandro Nobili, Silvio Garattini, et al, (2011); The pattern of patients admitted to internal medicine wards has dramatically changed in the last 20–30 years. Elderly people are now the
most rapidly growing proportion of the patient population in the majority of Western countries, and aging seldom comes alone, often being accompanied by chronic diseases, comorbidity, disability, frailty, and social isolation. Multiple diseases and multimorbidity inevitably lead to the use of multiple drugs, a condition known as polypharmacy. Over the last 20–30 years, problems related to aging, multimorbidity, and polypharmacy have become a prominent issue in global healthcare. This review discusses how internists might tackle these new challenges of the aging population.

Tejas Acharya, Dimple Mehta, et al (2013); The wide and indiscriminate use of drugs has increased the incidence and the modes of presentation of cutaneous drug reaction. Adverse cutaneous drug reactions are common, comprehensive information about their incidence, severity and ultimate health effects are unavailable.

SIVANANDY PALANISAMY, KOTTUR SG ARUL KUMARAN, et al (2011); The main aims of the study was to assess the incidence and pattern of ADRs, identifying comorbidities, past and present illness, assess causality, and the offending drugs, monitoring and documenting suspected adverse drug reaction(s) and to estimate the cost involved.

Mandavi, Sanjay D'Cruz, et al (2012); Several studies have reported adverse drug events ranging from 5 to 35 per cent in all age group from outpatient setting. However, adverse drug reactions (ADRs) particularly among a large sample of ambulatory elderly patients in India has not been reported. This study has attempted to identify ADRs and assessed their causality, preventability and severity, and also their risk factors in Indian ambulatory elderly patients.

Charnelda L. Gray, Carole Gardner (2012); By the year 2030, nearly 1 in 5 U.S. residents is expected to be aged 65 years or older; this age group is projected to more than double in number from 38.7 million in 2008 to more than 88.5 million in 2050.1,2 Likewise, the population aged 85 years or older is expected to increase almost 4-fold, from 5.4 million to 19 million between 2008 and 2050.1 As the elderly population continues to grow, the number of older adults who present with multiple medical conditions for which several medications are prescribed continues to increase, resulting in polypharmacy.

Megan L. Steele, Jan Axtner, et al (2014); In Europe, mistletoe extracts are widely used as a complementary cancer therapy. We assessed the safety of subcutaneous mistletoe as a conjunctive therapy in cancer patients within an anthroposophic medicine setting in Germany. Methods. A multicentre, observational study was performed within the Network Oncology. Suspected mistletoe adverse drug reactions (ADRs) were described by frequency, causality, severity, and seriousness. Potential risk factors, dose relationships and drug-drug interactions were investigated. Results. Of 1923 cancer patients treated with subcutaneous mistletoe extracts, 283 patients (14.7%) reported 427 expected effects (local reactions <5 cm and increased body temperature <38°C). ADRs were documented in 162 (8.4%) patients who reported a total of 264 events. ADRs were mild (50.8%), moderate (45.1%), or severe (4.2%). All were
nonserious. Logistic regression analysis revealed that expected effects were more common in females, while immunoreactivity decreased with increasing age and tumour stage. No risk factors were identified for ADRs.

Madiwalayya S Ganachari, TarunWadhwa, et al (2012); Adverse drug reactions (ADRs) are the leading cause of morbidity, mortality and increased healthcare cost. A new scientific tool has been developed to monitor and report ADRs. Trigger tool is one of the active data collection process which triggers to identify the ADR in a quicker fashion. The objective of our research was to study and assess the trigger tools for detection and analysis of ADRs.

L. J. G. Veehof á R. E. Stewart, et al (1999); Objectives: The risk of adverse drug reactions (ADRs) increases with the number of drugs used. Most studies refer to potential interactions; the results regarding the severity of occurring and registered ADRs are inconsistent. Therefore, we examined the relevance of drug-induced problems in the elderly in general practice and their association with polypharmacy.

Emily R. Hajjar, Angela C. Cafiero, et al (2007); Polypharmacy (ie, the use of multiple medications and/or the administration of more medications than are clinically indicated, representing unnecessary drug use) is common among the elderly. Objective: The goal of this research was to provide a description of observational studies examining the epidemiology of polypharmacy and to review randomized controlled studies that have been published in the past 2 decades designed to reduce polypharmacy in older adults.

Abdulraheem IS, (2013); The number of elderly is increasing worldwide and among them, polypharmacy is a reoccurring issue. Polypharmacy is simply defined as the use of multiple medications by a patient. This definition excludes topical and herbal medications as they are often not included in the traditional methods of assessing prescription quality. Vitamins and minerals taken as much needed by individual are also generally excluded in because of the inconsistent inclusion of these medications in polypharmacy. The precise minimum number of medications used to define “polypharmacy” is variable, but generally ranges from 5 to 10.

Snežana Mugoša1, ZoranTodorović, (2012); Adverse drug reactions (ADR) appear more frequently than what is actually reported and registered. The aim was to establish an intensive monitoring system and to analyze ADR in hospitalized patients.

Elinor C. CHUMNEY, Leslie C. ROBINSON, (2006); Polypharmacy, the state of being prescribed or taking more medications than clinically appropriate, can result in a variety of negative outcomes for both patients and healthcare facilities. These include negative outcomes such as adverse drug effects, hospitalizations, and poor patient health, as well as economic outcomes such as increased drug cost and costs associated with increased utilization of health services. Available data suggests pharmacists have the potential to have a large effect in combating this problem through a variety of interventions such as reducing the number of medications taken, reducing the number of doses taken, increasing patient adherence, preventing
adverse drug reactions (ADRs), improving patient quality of life and decreasing facility and drug costs.

Kirsten Schæfer, Henrik Mærkedahl, et al (2010) ; Polypharmacy increases the risk of side effects and interactions. We quantified the prevalence of major polypharmacy (MPP) in a Danish county with 236,000 inhabitants, invited general practitioners (GPs) to participate in a quality improvement project and discussed the medication of 10-20 MPP patients selected by the participating GPs.

David G. Le Couteur, Gary A. Ford, et al (2010) ; Prescribing in frail older people may be improved by application of the four tenets of medical ethics – beneficence, non-maleficence, autonomy, justice – rather than solely those of evidence-based medicine. Evidence-based medicine provides data primarily on the efficacy of interventions. In younger adults, this is often sufficient to make a decision to prescribe medications. In frail older people, there are additional issues that need to be considered, such as individualisation of efficacy data, increased risk of adverse drug reactions, patients’ views on risk and benefit, difficulties in assessing capacity to understand risk and benefit, consent to treatment, and concerns about the cost-effectiveness of interventions in the very old. In such situations, evidence-based medicine can be useful in informing the prescriber about the ethical principle of beneficence. However, the decision to prescribe or withdraw medications is also influenced by the other three tenets of medical ethics: non-maleficence (adverse drug reactions, polypharmacy), autonomy (consent, competency) and justice (appropriate allocation of healthcare resources).

Michael A. Steinman, C. Seth Landefeld, et al , (2011) ; In older persons with several chronic diseases, prescribing must balance competing tensions between limiting the number of medicines and using all medicines that may be beneficial.1–4 The number of medicines might be limited, because the use of multiple medications is associated with higher likelihood of drug–drug interactions, adverse drug events, hospitalizations, and death.5–7 Alternatively, more medicines might be prescribed, because evidence of efficacy and clinical guidelines support the use of a wide variety of drugs for common diseases such as ischemic heart disease, heart failure, and diabetes mellitus.

Kirsten K. Viktil, Hege Salvesen Blix, et al , (2008) ; As modern guidelines may recommend several drugs for a single medical condition, it follows that many patients, especially if comorbidity is present, use a number of medications. Also, an aging population implies more morbidity and consequently will have the result that many patients use many drugs – a situation often referred to as polypharmacy. Polypharmacy has been linked to negative health outcomes such as adverse drug reactions, interaction problems, poor patient adherence, and hospitalisations. Such experiences have led to the attitude that efforts should be made to reduce polypharmacy. However, this approach might prevent patients from obtaining optimal treatment. There is no universal definition of polypharmacy and measuring of a reduction in polypharmacy becomes problematic. Because polypharmacy is an imprecise term it should be used with caution
in research as well as in patient management. Moreover, studies have shown that undertreatment occurs frequently also among patients using many drugs. This is the Janus face of polypharmacy: too many drugs should be avoided, but the individual patient should receive the appropriate drugs that have the potential to reduce morbidity and improve quality of life. It is the individual drugs themselves, along with patient specific factors, and not a fixed number of drugs, that we should pay attention to.

Edisa Trumic, Nurka Pranjic, et al., (2012) ; Inappropriate prescribing of a multiple therapeutic agents to patients with chronic conditions is very common in everyday practice. Adverse drug reactions (ADRs) are still considered as one of the main problems of drug therapy. We investigated idiosyncratic symptoms and signs of adverse drug reactions (ADRs) of the most frequent used combination of drugs among hospitalized patients prescribed polypharmacy.

André de Oliveira Baldoni, Lorena Rocha Ayres, et al., (2013) ; This cross-sectional study was carried out with 1000 elderly outpatients assisted by a Basic Health District Unit (UBDS) from the Brazilian Public Health System (SUS) in the municipality of Ribeirão Preto. We analyzed the clinical, socioeconomic and pharmacoepidemiological profile of the elderly patients in order to identify factors associated with polypharmacy amongst this population. We used a truncated negative binominal model to examine the association of polypharmacy with the independent variables of the study. The software SAS was used for the statistical analysis and the significance level adopted was 0.05. The most prevalent drugs were those for the cardiovascular system (83.4%). There was a mean use of seven drugs per patient and 47.9% of the interviewees used ≥7 drugs. The variables that showed association with polypharmacy (P value < 0.01) were female gender, age >75 years, self-medication, number of health problems, number of medical appointments, presence of adverse drug events, use of over-the-counter drugs, use of psychotropic drugs, lack of physical exercise and use of sweeteners. The exposition to all these factors justified the high prevalence of polypharmacy amongst the interviewees. These results showed the need to adopt clinical intervention and educational and managerial measures to analyze and promote rationality in the use of drugs amongst the elderly users of SUS.

FITA RAHMAWATI, I DEWA PUTU PRAMANTARA, et al.,(2009) ; The elderly population in Indonesia continues to rise. The pharmacologic management of many acute and chronic conditions and the aging population have contributed to increase medication use among elderly patients, these situation may lead to drug related problem (DRPs) especially unnecessary drug therapy. The aim of this study was to identify unnecessary drug therapy on hospitalized geriatric patients, to calculate the waste of cost spent on unnecessary drugs and to investigate whether polypharmacy is a suitable indicator for occurrence of unnecessary drug therapy in a hospital setting.

Vicente Codagnone Neto, Victor Pundek Garcia, et al.,(2010) ; The aim of this study was to examine the possible adverse drug-drug interactions in the elderly population (≥60 years) diagnosed either with diabetes, arterial hypertension or both, at a Family Health Unit (FHU)
clinic in Blumenau, state of Santa Catarina, Brazil. For this purpose 318 subjects were interviewed using a pretested form with social and demographic aspects regarding their disease and its complications. All drugs used by this population were grouped, and the drug-drug interactions were detected by using the “Drug Interaction Checker” software, and classified for frequency and severity. The average age of patients was 70.6 years, with a higher number of female patients (216; 67.9%). Most subjects were being treated for both diseases (149; 46.86%). Out of a total of 1,541 medications prescribed, the most prevalent were: hydrochlorothiazide (131; 8.4%) and enalapril maleate (130; 8.4%). A total of 295 possible drug-drug interactions were detected in 152 patients (1.9 interactions per subject), 275 (93.2%) moderate and 20 (6.8%) severe or highly severe. The possible interaction prevalence was 0.93 (0.55 to 1.40 depending on health unit). The most frequent possible interaction was that between acetylsalicylic acid and enalapril maleate (37; 12.5%). Patients had an average consumption of 6.6 drugs and 9.8% of subjects reported physical discomfort when using medicines. Elderly patients use many medications that could cause adverse reactions and possible drug-drug interactions, where this issue warrants closer attention of prescribers and health providers.

André de Oliveira Baldoni1, Farah Maria DrumondChequer, et al, (2010) ; In recent decades, the world has undergone a demographic transformation with a rapid growth of the elderly population, resulting in an increased demand for funds to maintain their health and drug consumption. Pharmacokinetic and pharmacodynamic changes occurring in the elderly can interfere directly in the adverse effects of drugs and increase the risk of intoxication. In addition, there are external factors interfering with the pharmacotherapy of the elderly, such as inappropriate use and the lack of access to information. Many therapeutic classes of drugs should be used with caution or avoided in the elderly population, such as anti-inflammatory and some anti-hypertensive drugs, diuretics and digitalis. If not managed carefully, these medicines can affect the safety and quality of life in the elderly. Thus, the aim of this review was to identify drugs that should be used with caution in elderly patients in order to avoid intoxication and/or adverse drug events.

Michael Woodward, Benny Katz, et al, (2006) ; Pharmacotherapy is an essential component of medical care for older patients, and around two-thirds of Australians over the age of 60 years use 4 or more drugs. Although polypharmacy is a well-known risk factor for adverse drug events, use of multiple drugs may be unavoidable in the elderly with multiple comorbidities. While there have been concerns about inappropriate prescribing, polypharmacy and non-adherence, it is now recognised that there are a broader range of drug-related problems that need to be addressed. These include suboptimal monitoring of drugs, poor medication management in patients’ homes, under-prescribing and poor communication between health professionals. This is a review of the Australian literature on problems with medication use in the elderly, with guidelines for improving the quality of medicine use in this population.

Raquel S. Mendes-Netto, Claudia Q. V. Silva, et al, (2011) ; This pilot study aimed to assess drug-drug and drug-food interactions in elderly patients of a Family Health Care Unit in Aracaju,
Brazil. A descriptive pilot study was performed through an interview questionnaire with 35 elderly patients (28 women) of the Family Health Care Unit. The range of consumed medications was 1 to 7, and the rate was 3.1 medications/person. This pilot study identified that 34 elderly used multiple medication and its related problems such as risk of polypharmacy (5) and drug interaction (34). The class of drugs most commonly used was related to cardiovascular system, and alimentary tract and metabolism. Prescriptions with 2 to 3, 4 to 5 and 6 to 7 medications showed potential drug-drug interaction (39, 88.8 and 100%, respectively). Some drugs could not be administrated at meal time. These findings highlight the need for additional studies to further evaluate clinical outcomes associated with polypharmacy and potential drug-drug and drug-food interactions.

Daniel S. Budnitz, Maribeth C. Lovegrove, et al., (2011); Background Adverse drug events are important preventable causes of hospitalization in older adults. However, nationally representative data on adverse drug events that result in hospitalization in this population have been limited. We used adverse-event data from the National Electronic Injury Surveillance System–Cooperative Adverse Drug Event Surveillance project (2007 through 2009) to estimate the frequency and rates of hospitalization after emergency department visits for adverse drug events in older adults and to assess the contribution of specific medications, including those identified as high-risk or potentially inappropriate by national quality measures.

Rana Ibrahim,(2010); Type 2 diabetes is a chronic disease that has very serious complications if not appropriately treated. Many oral hypoglycemic agents have been effective recommendations in treating type 2 diabetes. Sitagliptin (Januvia), Exenatide (Byetta), and Exubera are 2 newer agents that have proven efficacious in disease management. The purpose of this paper is to review the efficacy, use, and tolerability of oral hypoglycemic agents that are older compared to Sitagliptin (Januvia), Exubera, and Exenatide (Byetta).

JAYESH M KATHIRIA, BHAGYA M SATTIGERI, (2012); Adverse drug reactions (ADRs) are the common problems faced in the setups like ICU where the poly pharmacy is involved in treating the patients. Control of such events is possible if the culpable drug is known or if it is identified and reported. However, reporting of adverse drug reactions still remains in its infancy for problems in many. Awareness about adverse drug reactions can decrease irrational use of medicines, poly pharmacy and adverse drug-drug interactions. A prospective, observational and non-interventional study was conducted over a period of 18 months in medical ICU of Dhiraj hospital, Piparia with the goal to highlight the responsibility of health care professionals in preventing, identifying, diagnosis, treating and reporting ADRs. The patients were monitored daily for ADRs. The data was analyzed for demographic parameters. The causality relationship between suspected drugs and the reactions were assessed by using various standard causality assessment scales. 1000 patients were enrolled for the study. Out of these 45 patients developed ADRs. Of these 27 males and 18 females developed ADRs showing male predominance (2.7%). The ADRs increased with increasing number of drugs administered. The drug class most
commonly implicated with ADRs was antibiotics 24(53.33%). The system most commonly involved with an ADR was gastrointestinal tract 26.67%. Most commonly reported reaction were hypoglycemia (13.33%) and Rash (11.11%).