

## Assessment of the geriatric patient's prescription for the analysis of medications and diseases

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### Abstract

**Objective:** Aging is broadly defined as a gradual functional decline in the living organism's intrinsic ability to defend, maintain, and repair itself in order to keep working efficiently and has attracted attention throughout the history of civilization

**Methods:** The recent work was an observational, prescription based study carried out in the nearby area of Jahangirabad Institute of Technology Faculty of Pharmacy, Barabanki UP., and India. A descriptive study was conducted for 3 months from March 2024 to June 2024. Elder from (50-100) years of age in outpatient department were recruited for this study.

**Results:** The data reveals a higher number of male patients (446) compared to female patients (324), with 65% of patients in the 50-70 age range and a notable decline in those over 70. Commonly prescribed medications include Omeprazole (275) for heartburn, Diclofenac (272) for pain, and dietary supplements for weakness. Amoxicillin is the most frequently prescribed antibiotic (86 instances), followed by Ciprofloxacin (53) and Metronidazole (45). Parenteral antibiotics like Gentamycin and Ceftriaxone are used for severe infections. This information highlights the need for targeted healthcare services for middle-aged and early senior patients and reflects the reliance on both oral and parenteral antibiotics for treating infections.

**Conclusion:** First and foremost, seniors should focus on living a healthy lifestyle. Eating a balanced diet, exercising regularly, and getting enough sleep are all essential components of maintaining good health. Seniors should speak with their doctor to determine the best course of action for their specific health needs. This may include implementing a specific diet, taking vitamins, or engaging in physical activity.

**Keywords:** Geriatrics; Healthy life; Prescription; Aging; Diet and Antibiotics

### 1. Introduction

Aging is broadly defined as a gradual functional decline in the living organism's intrinsic ability to defend, maintain, and repair itself in order to keep working efficiently and has attracted attention throughout the history of civilization [1, 2]. By 2030, 1 in 6 people in the world will be aged 60 years or over. At this time the share of the population aged 60 years and over will increase from 1 billion in 2020 to 1.4 billion. By 2050, the world's population of people aged 60 years and older will double (2.1 billion). The number of persons aged 80 years or older is expected to triple between

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2020 and 2050 to reach 426 million [3]. At the biological level, ageing results from the impact of the accumulation of a wide variety of molecular and cellular damage over time. This leads to a gradual decrease in physical and mental capacity, a growing risk of disease and ultimately death. These changes are neither linear nor consistent, and they are only loosely associated with a person's age in years.

A number of physical changes and health issues are more common as we age. However, just as all older adults are not the same, their health status also varies. Many are active and healthy, whereas others are frail, with multiple health conditions. Approximately 92 percent of older adults have at least one chronic condition, and 77 percent have two or more [4].

Physical and social environments can affect health directly or through barriers or incentives that affect opportunities, decisions and health behaviour. Maintaining healthy behaviours throughout life, particularly eating a balanced diet, engaging in regular physical activity and refraining from tobacco use, all contribute to reducing the risk of non-communicable diseases, improving physical and mental capacity and delaying care dependency [3].

There is a consensus that aging is associated with two key aspects: (i) the progressive decline of numerous physiological processes, such as the body's ability to accurately regulate homeostasis, and (ii) the enhanced risk of developing severe diseases such as cancer or cardiovascular disease. However, while aging is a major risk factor for many chronic diseases, it is important to recognize that aging and disease are not synonymous. Many older adults maintain good physical and mental health well into old age, and there is growing interest in promoting "successful aging" by focusing on factors that contribute to overall health and well-being [5].

Here, we will focus on recent findings on the prevalent diseases of aging, highlight the important roles of aging in multiple aging-related diseases in humans, and discuss efficient interventions and treatments.

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## 2. Methodology

The recent work was an observational, prescription based study carried out in the nearby area of Jahangirabad Institute of Technology Faculty of Pharmacy, Barabanki UP., India.

A descriptive study was conducted for 3 months from March 2024 to June 2024. The study was carried out in inpatient geriatric units including Out Patient Department at rural and urban areas. Treatment cost is very low which attracts patients from nearby rural areas and referral from government dispensaries. Elder from (50-100) years of age in outpatient department were recruited for this study.

### 2.1. Steps involved in methodology

Collection of prescriptions: We have collected 1000 prescriptions from rural (Barabanki) as well as urban (Jahangirabad) areas of related to geriatrics.

- **Screening the Prescriptions:** After collection, we have screened out 870 prescriptions related to recent work.
- **Analysing the Data:** In this, we examined the information contained in medical prescription. It involved that types of diseases and medications were evaluated.
- **Statistics of Data:** Obtaining data was organized and calculated, providing a comprehensive statistical summary."j

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## 3. Results

The number of male patients (M) is 446, while the number of female patients (F) is 324.

Males constitute a higher proportion of the patient population compared to females. The larger number of male patients might suggest a higher incidence of the condition or disease being studied among males.

This distribution could also indicate potential gender-related factors affecting health-seeking behavior, disease prevalence, or access to healthcare services.

**Table 1** Tailored Strategies for Age Spectrum

Sr. No.	Gender	No. of Patient	Percentage
1	M	446	58
2	F	324	42

### 3.1. Age Group Distribution

The distribution of patients across different age groups shows that the majority are in the 50-70 age range; with 32% of patients aged 50-60 and 33% aged 60-70, indicating that these age groups have the highest number of patients. The next largest groups are those aged 40-50 and 70-80, both with 13% and 14% of patients, respectively. The number of patients significantly decreases in the older age groups, with 7% of patients aged 80-90 and only 1% aged above 90.

**Table 2** Addressing the Age Groups of Patients

Sr. No.	Age	No. of Patient	Percentage
1	40-50	116	13
2	50-60	276	32
3	60-70	288	33
4	70-80	119	14
5	80-90	62	7
6	Above-90	09	1

The most prevalent disease among patients is related to the cardiovascular system, with 204 cases. This high number could indicate a significant burden of heart-related conditions within the patient population. Body pain (109 cases) and gastrointestinal tract issues (92 cases) are also prevalent, suggesting a variety of health concerns ranging from musculoskeletal to digestive issues. Respiratory tract infections (68 cases) are noteworthy, especially given the ongoing concerns about respiratory illnesses, including those possibly related to infectious diseases like influenza or COVID-19. Chronic diseases such as diabetes mellitus (53 cases) and nervous system disorders (44 cases) are also significant findings, highlighting the need for long-term management and care for such patients. Some conditions have fewer reported cases, such as UTI (12 cases), infections (6 cases), and tuberculosis (6 cases). Although less prevalent, these conditions still require appropriate diagnosis and treatment. Conditions like piles (1 case), eosinophilia (1 case), and cancer (3 cases) are relatively rare within this patient population but still require attention and specialized care.

The data in the table 4 reflects a healthcare environment where several health issues are particularly common among patients. Gastrointestinal problems, such as heartburn, are highly prevalent, as indicated by the frequent prescription of medications like Omeprazole and Rantac. Pain management is also a critical focus, evidenced by the high usage of various NSAIDs (Nonsteroidal Anti-Inflammatory Drugs) such as Diclofenac and Aceclofenac.

Respiratory infections are another significant concern, with a substantial number of prescriptions for antibiotics and bronchodilators like Ceftriaxone, Deriphyllin, and Salbutamol, indicating that conditions such as RTIs (Respiratory Tract Infections) and asthma are common. The variety of medication categories, from antipyretics like Paracetamol for fever to antiemetics like Perinorm for vomiting, highlights a comprehensive treatment strategy. This approach is designed to manage not only acute symptoms but also chronic diseases. For instance, medications like Amlodipine and Nifedipine are used to treat hypertension, while Metformin and Glimipride are commonly prescribed for diabetes management.

The frequent use of dietary supplements, including B.Complex, Calcium, and Vitamin D3, suggests that addressing general weakness and nutritional deficiencies is a significant part of patient care. This might indicate a high prevalence of conditions related to poor nutrition or chronic illnesses that necessitate supplementation.

**Table 3** Common Diseases Identified in Patients

Sr. No.	Disease	No. of Patient	Percentage
1	Cardio Vascular System	204	31.38
2	Gastro Intestinal Tract	92	14.15
3	Body Pain	109	16
4	Respiratory tract Infection	68	10
5	DM	53	09
6	Nervous System	44	07
7	Joint Pain	23	04
8	U T I	12	02
9	Infection	06	01
10	Piles	01	0.1
11	Eosinophilia	01	0.1
12	Weakness	28	04
13	Tuberculosis	06	01
14	Cancer	03	0.5

Additionally, the broad spectrum of antibiotics, such as Ciprofloxacin and Amoxicillin, and respiratory treatments indicates ongoing challenges with bacterial infections and respiratory ailments. These conditions require diverse and robust treatment protocols to effectively manage patient health.

Overall, the table demonstrates a multifaceted healthcare approach that prioritizes both the treatment of immediate, acute health issues and the management of longer-term, chronic conditions. This ensures that patients receive holistic care tailored to a wide array of health concerns, from common colds and infections to serious chronic diseases.

**Table 4** The data in the table reflects a healthcare environment where several health issues are particularly common among patients

S.No.	Medicine	Disease	Category	Frequency	Dosage form
1	Omeprazole	Heart burn	PPI	275	Cap.
2	Diclofenac	Pain	NSAIDs	272	Tab.
3	B.Complex	Weakness	Dietry suppliment	229	Tab.
4	Calcium	Weakness	Dietry suppliment	227	Tab./syp.
5	Folic acid	Weakness	Dietry suppliment	226	Tab.
6	Rantac	Heartburn	Antihistaminic	225	Tab./inj.
7	Paracetamol	Fever	Antipyretic	220	Tab.
8	Perinorm	Vomiting	Antiemetic	213	Inj.
9	Ceftriaxone	Cold ,Fever	Cephalosprin	203	Inj.
10	Vitamin -D3	Joint pain	Dietry supplement	185	Tab.
11	Deriphyllin	Chest pain ,RTI	Bronchodillators	175	Inj.
12	Hydrocortisone	Chest pain	Corticosteroid	170	Inj.

13	Salbutamol	Asthma	Bronchodilators	165	Tab.
14	Amilodepine	Hypertension	Ca channel blocker	156	Tab
15	Diclofenac gel	Pain	NSAIDs	145	Oint.
16	Gentamycin	RTI	Aminoglycoside	135	Inj.
17	Levocetirizine	RTI	Antihistaminic	132	Tab.
18	Aspirin	Breathlessness	NSAIDs	131	Tab.
19	Tramadol	Severe pain	Opoid analgesic	120	Inj.
20	Ciprofloxacin	Infection	Quinolone	120	Tab.
21	Metformin	D.M.	Biguanide	116	Tab.
22	Glimipride	D.M.	Salfonyl Urea	112	Tab.
23	Ecospirin	Chest pain ,blood clotting	Blood thinner	111	Tab.
24	Azithromycin	RTI	Macrolide	110	Tab.
25	Dicyclomine	Stomachache	Anticholinergic	90	Tab.
26	Amoxicillin	Infection ,cold	Penicillin	90	Cap.
27	Ondansetron	Vomiting	Antiemetics	85	Tab.
28	Aceclofenac	Pain	NSAIDs	82	Tab.
29	Sorbitol	Constipation	Laxative	80	Tab.
30	Dexamethasone	Allergic reaction	Corticosteroid	75	Inj.
31	Vitcofol	Weakness	Vitamin supplement	72	Inj.
32	Amikacin	RTI	Aminoglycoside	72	Inj.
33	Flagyl	RTI,PID	Nitroimidazole	62	Tab.
34	Mecobalamin	Weakness	Vit .-B12 suppliment	54	Tab.
35	Serratiopeptidase	Inflammation	NSAIDs	52	Tab.
36	Fluconazole	Fungal infection	Antifungal	52	Tab.
37	Cetirizine	Allergies	Antihistaminic	45	Tab.
38	Prebiotic	Bowel upset	Lactobacillus	40	Cap.
39	Zerodol -SP	Pain	NSAIDs	40	Tab.
40	Nifedipine	Hypertension	Ca channel blocker	30	Tab.
41	Doxycyclin	Pelvic inflammation	Tetracyclin	30	Cap.
42	Acyclovir	U.T.I.	Antiviral	30	Tab.
43	Allopurinol	Excessive urination	Xanthin oxidase analogue	21	Tab.
44	Chlorphenaline	R.T.I	Antihistaminic	20	Tab.
45	Lasix	Hypertension, Swelling	Diuretics	20	Tab.
46	Calcium gluconate	Chest pain, Weekness	Calcium Salt	13	Tab.
47	Alkosol	U.T.I.	Urinary alkoliser	12	Syp.
48	Albendazole	Stomach upset	Anti protozoal	10	Tab.
49	Amoxyclave	Infection	Penicillin	08	Tab.
50	Seroflow	Asthma	Corticosteroid	06	Tab.

51	C.M.C.	Ocular pain	Ophthalmic lubricant	04	E./d.
52	Dextroxe	Dehydration	Oral	02	Powder

The table 5 showed the lists of the commonly used antibiotics for patients, categorized by the drug type, frequency, and route of administration. Here are the key observations:

The table 5 includes a broad spectrum of antibiotics from different categories, such as Penicillins, Quinolones, Nitroimidazoles, Macrolides, Aminoglycosides, Cephalosporins, and Tetracyclines. This variety indicates a comprehensive approach to managing various bacterial infections. The predominance of oral administration suggests that many infections are treated in outpatient settings or in cases where patient compliance and convenience are prioritized. Parenteral administration indicates the need for more intensive treatment, possibly in severe infections or hospitalized patients.

**Table 5** Commonly used Antibiotic drugs for Patient

Sr. No.	Drug	Category	Frequency	Route of Administration
1	Amoxicillin	Penicillin	86	Oral
2	Ciprofloxacin	Quinolone	53	Oral
3	Metronidazole	Nitroimidazole	45	Oral
4	Azithromycin	Macrolide	29	Oral
5	Flozyl	Nitroimidazole	21	Oral
6	Gentamycin	Aminoglycoside	23	Oral /parentral
7	Amikacin	Aminoglycoside	10	Parentral
8	Ceftriaxone	Cephalosporin	15	Parentral
9	Doxycycline	Tetracycline	5	Oral

The table 6 provides a comparison between the number of geriatric patients admitted to the hospital and those treated on an outpatient basis (OPD).

### 3.1.1. Total Number of Patients

- Admitted Patients: **85**
- OPD Patients: **665**

### 3.1.2. Ratio of OPD to Admitted Patients

There is a significantly higher number of geriatric patients treated on an outpatient basis compared to those admitted. The ratio of OPD patients to admitted patients is approximately 8:1, indicating that for every admitted patient, there are nearly eight OPD patients.

**Table 6** Admitted and OPD case of geriatric patient

Sr. No.	Patient	No. of Patient
1	Admit	85
2	O.P.D.	665

The table 7 provides data on the number of patients based on the route of administration (R.O.A.) of their medications.

The total number of patients receiving medications through various routes of administration is 508. Oral administration is the most common route, accounting for nearly half of all cases. This reflects the convenience, ease of administration,

and patient compliance associated with oral medications. It is often preferred for its non-invasive nature and ease of self-administration. Parenteral administration is the second most common route, used in about one-third of the cases. This includes intravenous, intramuscular, and subcutaneous injections. Parenteral administration is typically used for more severe conditions, faster onset of action, or when oral administration is not feasible. Intranasal administration used in 45 patients, this route is often chosen for medications intended to act quickly within the nasal passages or for systemic effects without the need for injections. Common applications include treatments for nasal congestion, allergies, and certain hormone therapies. Topical administration used in 35 patients, this route involves applying medications directly to the skin or mucous membranes. It is commonly used for localized treatments, such as skin infections, inflammation, and pain relief.

**Table 7** Route of administration of geriatric patient-

Sr. No.	R.O.A.	No. of Patient	Percentage
1	Oral	253	49
2	Parental	175	34
3	Intranasal	45	9
4	Topical	35	7

#### 4. Discussion

The number of male patients (M) is 446, while the number of female patients (F) is 324.

Males constitute a higher proportion of the patient population compared to females. The larger number of male patients might suggest a higher incidence of the condition or disease being studied among males.

This data suggests a higher concentration of patients in the middle-aged to early senior age brackets, with a sharp decline in the very elderly population.

The recent work reported that a higher concentration of patients in the middle-aged to early senior age brackets, with a sharp decrease in the elderly population. This data can be useful for healthcare planning and resource allocation, highlighting the need for targeted medical services for the middle-aged and early senior demographics.

Old age is the range of ages for people nearing and surpassing life expectancy. People of old age are also referred to as: old people, elderly, elders, seniors, senior citizens, or older adults [6].

With a total of 564 patients, or 65% of the overall population, the data indicates a significant proportion of patients in the 50–70 age range. This implies that these age groups have higher rates of health problems or hospital visits. As age rises over 70, there is a consistent decrease in the patient population. The decline is most noticeable in the age groups beyond 90 and between 80 and 90. Numerous causes, such as increased death rates and fewer people reaching these elderly ages, might be to blame for this. Based on the research, people in their 50s to 70s may need healthcare resources more frequently. This might help with healthcare planning.

As we age, our hearts may become less effective, which reduces our endurance. Blood flow can be restricted by atherosclerosis. Many older adults have several chronic ailments, and others have at least one. In the US, uncontrolled hypertension (34%) was the most common ailment among the elderly (50%) followed by heart disease (32%). Urinary incontinence is often found in old age. In over 40% of cases, digestive issues include bleeding, constipation, trouble swallowing, and an inability to consume enough food to absorb nutrients are signs of advanced age. Joint and bone issues: "Thinning and shrinkage" is a sign of aging bones. By the time they are 80 years old, this might cause them to lose two inches (5 cm) of height, stoop in many cases, and be more susceptible to bone and joint disorders. [7]. About 655,000 adults entered the hospital because of diabetes. Being overweight, inactive and age 45 and older are three prominent risk factors for type 2, or adult-onset, diabetes. Common reasons for hospitalization due to diabetes include strokes, heart attacks, ulcers and dehydration from elevated blood sugar levels [8].

It was reported in this study that, the most commonly prescribed medication is omeprazole (275 prescriptions for heartburn), closely followed by diclofenac (272 prescriptions for pain). In addition, dietary supplements containing over 220 prescriptions each, such as B. Complex, calcium, and folic acid, are frequently given for weakness. Dietary

supplements are substances you might use to add nutrients to your diet or to lower your risk of health problems such as weakness, less immunity, osteoporosis or arthritis. Dietary supplements come in the form of pills, capsules, powders, gel capsules and tablets, extracts, or liquids. They might contain vitamins, minerals, fiber, amino acids, herbs or other plants, or enzymes. Sometimes, the ingredients in dietary supplements are added to foods and drinks [9]. Heartburn, fever, vomiting, and respiratory tract infections are common conditions treated with medications; Rantac, Paracetamol, Perinorm, and Ceftriaxone have been prescribed more than 200 times apiece. Notable drugs include metformin for diabetic mellitus, vitamin D3 for joint pain, and Deriphyllin for chest discomfort. The list covers a wide range of frequent health concerns treated in this patient population, including pain, infections, respiratory disorders, hypertension, and gastrointestinal issues.

The data showed that Amoxicillin, a penicillin antibiotic, is the most frequently prescribed drug with 86 oral administrations, likely due to its broad-spectrum effectiveness against common bacterial infections. Amoxicillin is used to treat certain infections caused by bacteria, such as pneumonia; bronchitis (infection of the airway tubes leading to the lungs); and infections of the ears, nose, throat, urinary tract, and skin. It is also used in combination with other medications to eliminate *H. pylori*, a bacteria that causes ulcers. Amoxicillin is in a class of medications called penicillin-like antibiotics. It works by stopping the growth of bacteria.

Antibiotics such as amoxicillin will not work for colds, flu, and other viral infections. Taking antibiotics when they are not needed increases your risk of getting an infection later that resists antibiotic treatment [10].

Ciprofloxacin and Metronidazole follow, with 53 and 45 oral administrations respectively, indicating their importance in treating a range of infections. Ciprofloxacin is a broad-spectrum antibiotic which means that it's used to treat a number of bacterial infections like uncomplicated urinary tract infections (UTIs) where other antibiotics are not suitable and complicated UTIs, chest infections (including pneumonia), skin and bone infections, sexually transmitted infections (STIs), conjunctivitis, eye infections, ear infections [11].

Azithromycin, another widely used antibiotic, has 29 oral administrations. Azithromycin is used to treat certain bacterial infections, such as bronchitis; pneumonia; sexually transmitted diseases (STD); and infections of the ears, lungs, sinuses, skin, throat, and reproductive organs [12]. Gentamycin and Amikacin, aminoglycosides, are notable for their parenteral (and in the case of Gentamycin, also oral) routes, reflecting their use in more severe infections. Ceftriaxone, a cephalosporin, is administered parenterally 15 times, underscoring its role in serious infections. Doxycycline, with only 5 oral administrations, is less frequently used, possibly due to its narrower spectrum of activity or specific indications. This distribution highlights the reliance on oral antibiotics for common infections and the use of parenteral options for more severe cases.

Seniors are more prone to infections because their immune system becomes less efficient as they age. Common infections like pneumonia, influenza, skin infections, and urinary tract infections are often mild. But for seniors, these illnesses may be much harder to diagnose, leading to chronically poor health, ongoing discomfort, and a higher risk of hospitalization. It's also crucial to look out for common signs and symptoms of infection in the elderly including chills, fever, aches, loss of appetite, and confusion [13].

A change in mental status or decline in function may be the only presenting problem in an older patient with an infection. An estimated 90 percent of deaths resulting from pneumonia occur in people 65 years and older. Mortality resulting from influenza also occurs primarily in the elderly. Urinary tract infections are the most common cause of bacteremia in older adults. Asymptomatic bacteriuria occurs frequently in the elderly; however, antibiotic treatment does not appear to be efficacious [14].

There is a significantly higher number of geriatric patients treated on an outpatient basis compared to those admitted. The ratio of OPD patients to admitted patients is approximately 8:1, indicating that for every admitted patient, there are nearly eight OPD patients.

Oral administration is the most common route, accounting for nearly half of all cases. This reflects the convenience, ease of administration, and patient compliance associated with oral medications. Parenteral includes intravenous, intramuscular, and subcutaneous injections. Parenteral administration is typically used for more severe conditions, faster onset of action, or when oral administration is not feasible. The most popular method of administering drugs, including supplements, is enteral or oral. This involves taking tablets orally, sometimes known as PO (for oral, from the Latin per os, which means by mouth). The least intrusive and most convenient way to provide medication is orally (PO); nonetheless, drugs administered PO must be acid stable or shielded from stomach acid (e.g., with enteric coatings). Parenteral drug delivery, on the other hand, involves more intrusive procedures. It can be applied in situations when a



medication is unstable or poorly absorbed in the digestive system or in situations where a drug's effects must take action right away, including in anaphylaxis or other crises [15].

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## 5. Conclusion

Compared with younger people, older people present with less muscle tissue and strength at the initiation of the illness and lose the muscle tissue more rapidly during the illness. Body weakness is a chief complaint among the older population and requires an extensive evaluation to treat the cause. When evaluating any older patient, one must always consider their functional status and goals of care and also focus on conditions that do not tend to cause weakness but can interfere with coordination, balance, vision, and mobility or that can make movement painful as older patients can mistakenly describe the effects of such conditions as a weakness. A proper diet and exercise are the key factors in managing body weakness in old age, which can be caused due to several factors.

First and foremost, seniors should focus on living a healthy lifestyle. Eating a balanced diet, exercising regularly, and getting enough sleep are all essential components of maintaining good health. Seniors should speak with their doctor to determine the best course of action for their specific health needs. This may include implementing a specific diet, taking vitamins, or engaging in physical activity.

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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