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Polypharmacy and Physical Therapy in the Geriatric Population

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POLYPHARMACY AND PHYSICAL THERAPY IN THE
GERIATRIC POPULATION

by

Cathy Reuer
Bachelor of Science in Physical Therapy
University of North Dakota, 1995

An Independent Study

Submitted to the Graduate Faculty of the

Department of Physical Therapy

School of Medicine

University of North Dakota

in partial fulfillment of the requirements

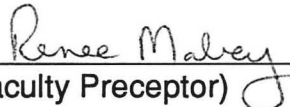
for the degree of

Master of Physical Therapy

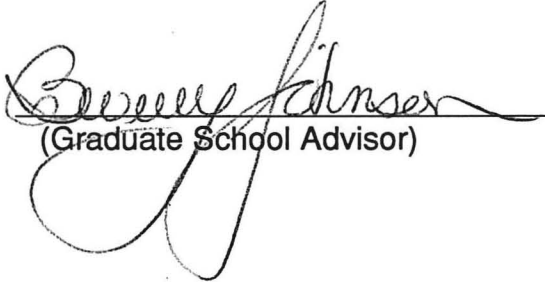
Grand Forks, North Dakota
May
1996



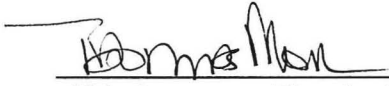
This Independent Study, submitted by Cathy Reuer in partial fulfillment of the requirements for the Degree of Master of Physical Therapy from the University of North Dakota, has been read by the Faculty Preceptor, Advisor, and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.



(Faculty Preceptor)



(Graduate School Advisor)



(Chairperson, Physical Therapy)

PERMISSION

Title Polypharmacy and Physical Therapy in the Geriatric Patient

Department Physical Therapy

Degree Master of Physical Therapy

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Date 12-12-95

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ABSTRACT

Physical therapists are seeing more and more elderly individuals with acute, chronic, or multiple disease conditions. Many of these conditions are treated with medications. It is common for the geriatric patient to be taking multiple medications. Polypharmacy is a relevant concern for physical therapists as adverse effects are often revealed in the musculoskeletal and central nervous systems. These manifestations can cause adverse effects in evaluation, treatment, and outcomes.

The purpose of this study is to discuss the common non-prescription and prescription medications consumed by the elderly, describe the biologic and physiologic changes that occur with age and how these changes alter medication effects, and to discuss the physical therapist's role in treating geriatric individuals who take multiple medications. The procedure will be a literature review.

The study will lead to increased awareness and knowledge of pharmacology in physical therapy. The information will lead to more effective treatment and education for the patient and family.

CHAPTER I

INTRODUCTION

The life span of individuals today is increased by prevention measures, early recognition of disease, and improved medical technology. With these advances prolonging the life span, society will be noticing more and more people over the age of 65. The growing elderly population is producing more people with chronic and acute disease conditions, as well as multiple conditions. These conditions can be treated or monitored with medications.¹ These medications are purchased and consumed regularly by the geriatric population.²

It has been found that “the elderly are the primary drug users, taking at least fifty percent of the total drugs consumed.”^{3(p174)} It has also been estimated that between 87% and 92% of prescription and non-prescription medications are used in a multiple fashion (taking more than one at a time).

Prevention, diagnosis, or therapy is the rationale behind the prescribing of medications to the population in general, including the geriatric population. Polypharmacy (consuming multiple medications daily) places an individual at risk for adverse drug reactions. Adverse drug reaction is defined by the World Health Organization as “any response to a drug which is noxious, unintended, and which occurs at doses used in people for prophylaxis, diagnosis, or

therapy.”^{4(p449)} The prevalence of adverse drug reactions increases after the age of 60 years and especially for those who take five or more medications daily.⁵ “Adverse drug reactions increase the morbidity, mortality, and cost of care in elderly individuals.”^{4(p449)}

Adverse drug reactions resulting from polypharmacy are relevant to physical therapy because their effects are often on the musculoskeletal system and central nervous system. Musculoskeletal concerns related to polypharmacy include fractures, ligament damage, and contusions. These are often a direct result of falls that occur due to multiple medication use. Central nervous system effects often include involuntary movements, dizziness, vertigo, and ataxia. For example, an individual may fall due to adverse effects of their medication. This fall could result in a hip fracture for which the individual would receive physical therapy. The person may show some signs of dizziness during therapy which could be directly related to the medications that he or she takes. It is the responsibility of the physical therapist to treat the fracture and search for the underlying problem which may be the individual’s medication use. It is likely that the effects of medication can make physical therapy challenging if signs and symptoms of multiple medication use show up in other systems of the body.

Physical therapists should be familiar with the types of medications, possible adverse reactions, and the treatment of complications that may arise as a result of polypharmacy. This paper will discuss the common non-prescription and prescription medications consumed by the elderly, describe biologic and

physiologic changes of the body with age, and discuss the physical therapist's role in treating geriatric individuals who take multiple medications.

CHAPTER II

PHARMACOLOGIC AGENTS

The geriatric population consumes a variety of non-prescription and prescription drugs to help manage cardiovascular disease, genitourinary problems, musculoskeletal problems, respiratory disease, and central nervous system disturbances. The non-prescription and prescription drugs can be classified by subcategories. Each category will be discussed relative to purpose, considerations for use, and adverse reactions.^{3,4}

Non-Prescription Drugs

The first major category of medications used by the elderly are non-prescription (over-the-counter) drugs. This major category can be broken down into four smaller categories: vitamins, analgesics, laxatives, and antacids.

Vitamins are the first group of non-prescription drugs to be discussed. Their purpose for use in the elderly is to correct deficiency states due to genetic factors, insufficient dietary intake, or malabsorption.⁶ They are also used to prevent anemia. The major precaution for the elderly patient is toxicity due to taking vitamins that are not needed or which exceed the recommended daily dosage. Another precaution with prolonged or inappropriate use is reduced renal function.⁶

The second group of over-the-counter medications used widely by the elderly are analgesics. Non-prescription analgesics are referred to as mild analgesics. Strong analgesics require a physician's prescription and will be discussed later.

The purpose of the mild analgesic is to provide pain relief. Aspirin and acetaminophen (Tylenol) fall into the mild category. Aspirin is best for pain relief and it also relieves inflammation for conditions such as arthritis. Acetaminophen eliminates fever and pain, but it has very little anti-inflammatory action. When the geriatric patient uses these medications, it is important to pay attention to dosage as adverse reactions are dose related and include heartburn, gastrointestinal bleeding, nausea and vomiting, cramps, constipation, tinnitus, deafness, headache, and dizziness.⁶ Examples of mild analgesics are listed in Table 1.

Many elderly individuals buy laxatives over-the-counter. Laxatives aid in keeping bowel movements regular. Although there are many types of laxatives available today, the focus will be on these four: osmotically-active agents (milk of magnesia, Epsom salt, and Fleet's enema), mucosal irritants (caster oil and Dulcolax), a lubricant (mineral oil), and bulk increasing agents (bran, Metamucil, and Fibercon).⁶ The osmotically-active agents work by retaining water in the intestines. If an elderly individual has renal dysfunction, he or she would want to avoid this type of laxative. Caster oil and Dulcolax work by "irritating" the intestine and forcing substances to move through it. This group tends to have

Table 1.—Mild Analgesics⁶

-
- Tylenol
 - Aspirin
 - Zactane
 - Darvon
 - Fiorinal
 - Percodan
 - Zactirin
-

an “excessive effect” so the elderly person would not want to take this right before bed. Mineral oil slows down water reabsorption in the intestine. The body may have difficulty absorbing fat soluble vitamins with excessive use of this product. An elderly individual who increases the amount of bran in his or her diet may also receive laxative effects, but he or she should drink adequate fluids to prevent obstructions in the bowel.⁶ Examples of laxatives are listed in Table 2.

The final group of non-prescription drugs commonly used by the geriatric population is antacids. Antacids “neutralize or remove acid from the gastric contents and decrease peptic activity.”^{6(p1042)} The antacids carry a warning related to their sodium content. The sodium precaution should especially be noted by individuals diagnosed with hypertension, heart disease, renal failure, or cirrhosis of the liver, as increased sodium intake can cause complications of their existing condition.⁶ Adverse reactions include hypertension, edema, constipation, toxicity, and in rare cases, neurological, neuromuscular, and/or cardiovascular impairment.⁶ Examples of antacids are listed in Table 3.

Prescription Drugs

The second major category of drugs purchased and consumed by the elderly is prescription drugs. This major category can also be divided into smaller groups which are strong analgesics, antihypertensive agents, anti-arrhythmic drugs, anti-atherosclerosis medications, and drugs to treat central

Table 2.—Laxatives⁶

-
- Epsom Salt
 - Milk of Magnesia
 - Fleet's Enema
 - Glycerin Suppositories
 - Ducolax
 - Caster Oil
 - Phenolax
 - Metamucil
 - Surfak
-

Table 3.—Antacids⁶

-
- Amphojel
 - Riopan
 - Aludrox
 - Camalox
 - Creamalin
 - Di-Gel
 - Maalox
 - Mylanta
 - WinGel
-

nervous system disorders.⁶ Each category will be discussed relative to purpose, considerations for use, and adverse reactions.

The purpose of strong analgesics is to aid in the elimination of pain. Examples of strong analgesics are morphine and Demerol.⁶ This group is most often used for moderate to severe pain or when the source of pain cannot be identified or controlled in a timely manner. Strong analgesics produce adverse effects more frequently than mild analgesics.⁶ Dependence and tolerance may become issues for the individual.⁶ Dependence occasionally occurs when the individual uses the medication for a chronic condition over a period of many years. With extended use, tolerance increases and it may be necessary to increase the dosage to receive the therapeutic effect intended. Adverse reactions to strong analgesics include nausea and vomiting, respiratory depression, constipation, orthostatic hypotension, and sedation. Examples of strong analgesics are listed in Table 4.

Three main types of antihypertensive agents are prescribed to the elderly patient with high blood pressure. These include diuretics, vasodilators, and Beta blockers.⁶ The purpose of antihypertensive medications is to decrease the individual's cardiovascular risk status by decreasing the workload of the myocardium. Diuretics increase the amount of urine the person secretes and are generally the first prescribed to combat the problem of high blood pressure.⁶ Vasodilators dilate the blood vessels, thus blood flows through the vessels more smoothly and effectively. Vasodilators often need to be taken in multiple doses

Table 4.—Strong Analgesics⁶

-
- Nisentil
 - Leritine
 - Dilaudid
 - Demerol
 - Dolophine
 - Leveprome
 - Pantopon
-

daily and this factor makes them quite costly. The price can make it difficult for some elderly individuals to continue purchasing their medication. The third type of antihypertensive drug is the Beta blockers. These drugs “block inhibiting stimuli from the nervous system,”^{6(p372)} meaning they allow the blood vessels to remain dilated which promotes blood flow. Beta blockers are also expensive drugs to purchase, so the price could again be a concern or disadvantage.

Adverse reactions for all antihypertensive drugs are as follows: tachycardia, palpitations, increased cardiac work, flushing of the skin, headaches, cardiovascular collapse (which consists of bradycardia, hypotension, and heart block), and gastrointestinal and central nervous system disturbances.⁶

Examples of antihypertensive agents are listed in Table 5.

Elderly individuals with an irregular heartbeat are often prescribed medications classified as anti-arrhythmics. Their purpose is to help alleviate the arrhythmic conditions of the heart. Medications are most often prescribed for tachycardiac conditions, as individuals with bradycardiac conditions usually require a pacemaker. Many of the adverse reactions seen with anti-arrhythmics are proportional to the dosage taken. Gastrointestinal discomfort may include nausea, vomiting, diarrhea, and abdominal pain. Central nervous system disturbances include tinnitus, headaches, visual impairment, drowsiness, ataxia, dysarthria, and nystagmus.⁶ Examples of anti-arrhythmic agents are listed in Table 6.

Table 5.—Antihypertensive Agents⁶

-
- Reserpine
 - Raudixin
 - Rauwiloid
 - Harmonyl
 - Moderil
 - Aldomet
 - Catapres
 - Ismelin
 - Minipress
 - Lopressor
-

Table 6.—Anti-arrhythmic Agents⁶

-
- Quinaglute
 - Cardioquin
 - Quinidex
 - Pronestyl
 - Dilantin Sodium
 - Inderal
 - Norpace
 - Bretylol
-

Medications to prevent atherosclerosis are commonly prescribed in the geriatric population. The purpose of atherosclerosis medication is to prevent hardening of the arterial wall. Adverse reactions to be aware of include constipation, nausea, diarrhea, and flushing of the skin.⁶ Examples of anti-atherosclerosis agents are listed in Table 7.

The final category to be discussed is the medications used to treat disorders of the central nervous system. It is not uncommon for the geriatric population to suffer from insomnia and/or depression. Insomnia is treated with hypnotic agents such as barbiturates.⁶ Barbiturates tend to be misused frequently and can produce psychological dependence in elderly individuals.⁶ Adverse reactions for the barbiturates include excessive drowsiness, decreased reaction time, decreased coordination, decreased motor function, vertigo, and ataxia.

Loss of a spouse or friends, failing health conditions, feelings of uselessness, and a change in living environment can contribute to depression in the geriatric population. For these reasons, antidepressant medications are commonly prescribed. Tricyclics, Monamine Oxidase Inhibitors (MAO Inhibitors), and Lithium are three commonly prescribed antidepressant drugs. Tricyclics are quite effective, but have a lag time of three to five days before any result or improved condition is seen.⁶ Adverse reactions associated with tricyclics are dry mouth, blurred vision, constipation, tachycardia, drowsiness, and agitation.⁶ MAO Inhibitors tend to react with certain types of food, which can

Table 7.—Anti-atherosclerosis Agents⁶

-
- Questran
 - Colestid
 - Cytellin
 - Lorelco
 - Norlutate
 - Anavar
-

result in adverse reactions such as hypertensive crisis and, more severely, death. Another possible adverse reaction to MAO Inhibitors is postural hypotension. Lithium is the third most common drug given to treat depression. Adverse reactions to be aware of regarding Lithium include tremors, anorexia, nausea, increased thirst, decreased concentration, and decreased thyroid function.⁶ Examples of antidepressant agents are listed in Table 8.

In this section, two major categories of drugs (non-prescription and prescription) have been discussed. The medications were discussed relative to their purpose, considerations for use, and possible adverse reactions. The next chapter will focus on the biologic and physiologic changes in the geriatric population. It will be the purpose of the following chapter to determine why adverse reactions occur as a result of polypharmacy in the aging individual.

Table 8.—Antidepressants⁶

-
- Elavil
 - Vivactil
 - Amitriptyline
 - Tofranil
 - Norpramin
 - Sinequan
 - Marplan
 - Nardil
 - Eskalith
-

CHAPTER III

BIOLOGIC AND PHYSIOLOGIC CHANGES OF AGING

The age of an individual is a major variable in determining the possibility of an adverse drug reaction.⁷ Adverse drug reactions are most likely to occur at both ends of the age spectrum, infant and elderly.⁷ When prescribing medications, physicians often fail to give enough consideration to the differing needs of young adults, adults, and the elderly.⁷

With increasing age, individuals are found to be more susceptible to the age-related changes that affect drug deposition and response. The biologic and physiologic changes that occur in the aging individual are extremely significant when determining why adverse reactions occur.⁸ Five areas that are affected by increasing age are absorption, distribution, metabolism, excretion, and tissue sensitivity. Each area has specific changes that occur, but it is the combined changes in all areas that affect the aging individual and his or her medication use.

The absorption process of medications is affected by increasing age, however, not to the same degree as other body processes.⁸ In the elderly, the absorption rate of drugs into the circulatory system is slowed, which hinders the therapeutic effects of the drug.⁸ Age-related changes that affect absorption and

lead to adverse drug reactions are decreased absorptive surface area of cells and tissues, decreased splanchnic blood flow, increased gastric pH, altered gastrointestinal motility, and unusual eating habits.^{7,8}

Changes in distribution processes occur as one ages.⁸ Changes in body composition and a decrease in protein are two factors to be discussed. Age-related changes in body composition include decreased lean body mass and total body water, and increased total body fat.^{7,8} The composition changes affect the amount of area into which the drug is released and result in an increased drug concentration in the body leading to adverse reactions.⁸ Secondly, distribution can be affected by a decrease in the amount of serum albumin, a protein that allows drugs to bind to the correct substances in the body.⁸ This means that there are fewer binding sites available for the drug.

Metabolism is another area that is affected by age. As age increases, metabolism slows down and drug metabolizing enzymes are decreased.⁸ If the metabolic process is altered, no detoxification can occur. If detoxification does not occur, tissues receiving the drug will become over medicated. Over medication leads to improper results from the drug and occasionally toxicity.⁹

Excretion is the fourth process that is commonly slowed by aging. Excretion primarily deals with kidney function. With slowed renal function, medications leave the body more slowly and the potential for drug accumulation and over medication is increased.⁸ Age-related changes that affect the rate of

excretion in the elderly are decreased renal blood flow, decreased glomerular filtration rate, and decreased tubular secretory function.^{7,8}

Tissue sensitivity is the final area to be discussed. The geriatric population can have both an increase or decrease in their sensitivity to a drug.⁷ Hypersensitivity leads to adverse drug reactions because it takes less than the normal amount of the drug to get a response. The excess builds up and leads to over medication and toxicity. Hyposensitivity can lead to taking excessive amounts of the medication to receive the therapeutic benefits. Overdosing on the medication leads to adverse drug reactions. The hyper and hyposensitivity responses are secondary to altered receptor numbers, altered receptor affinity, altered second messenger function, and altered cellular responses.⁸ Figure 1 is a representation of changes that occur in the aging body and the relation to drug use.

This chapter has discussed biologic and physiologic changes in the elderly individual. The five areas that were covered are the processes of absorption, distribution, metabolism, excretion, and tissue sensitivity. The following chapter will implicate the physical therapist's role in treating patients who consume multiple medications.

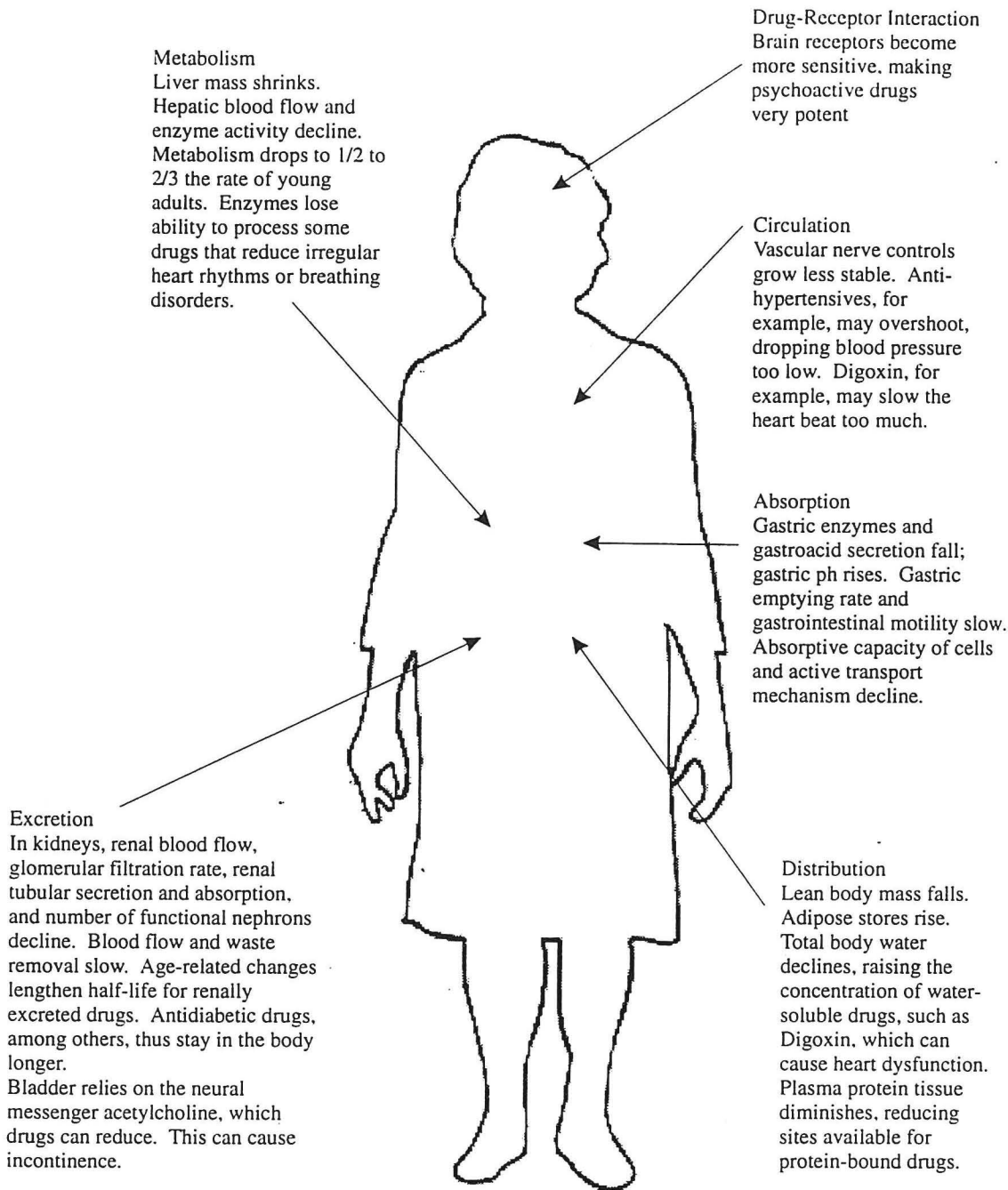


Figure 1. Aging body and drug use. Reprinted from Geriatric Nursing with permission: Bezon J. Approaching drug regimens with a therapeutic dose of suspicion. 1991;12:180-182.

CHAPTER IV

PHYSICAL THERAPY INTERVENTION

The goal of rehabilitation is to restore and educate an individual so he or she can realize his or her maximum functional ability, positive self-concept, and comfortable level of independence.¹⁰ Physical therapists see many individuals taking multiple medications. The person may be taking medications for the same condition for which he or she is receiving physical therapy, or for treatment of pre-existing conditions which are unrelated to the physical therapy diagnosis.¹¹ Regardless of the intent, polypharmacy can cause adverse reactions that prevent individuals from reaching their highest level of functional ability.¹² It is therefore important for the physical therapist to realize how medications can impact the physical therapy treatment sessions.

This chapter will discuss the side effects of polypharmacy that are of major concern to physical therapists. It will also evaluate how certain treatment regimes can alter the intended response of medication. Finally, it will discuss the role of the physical therapist as an educator and effective communicator.

Side Effects

There are six side effects of polypharmacy that are of concern to the physical therapist as they negatively impact the physical therapist's and patient's

rehabilitation goals.¹³ The major side effects include postural hypotension, weakness and fatigue, depression and confusion, involuntary movements, dizziness and vertigo, and urinary incontinence.^{10,13}

Postural hypotension is very common in the elderly who take multiple medications. Postural hypotension is a decline in blood pressure when the person moves from a supine or sitting position to standing.¹³ This can make working on independent transfers more difficult and time consuming for the individual. It is the responsibility of the physical therapist to be aware of normal blood pressure changes a patient should experience when switching positions. Systolic blood pressure should decrease 10 mmHg or less and diastolic blood pressure should increase no more than 5 mmHg.¹³ The physical therapist should take the patient's blood pressure in supine, sitting, and standing and record the results. Blood pressure changes can be detected from 30 seconds to 2 minutes after a postural change.¹³ Medications responsible for causing postural hypotension are listed in Table 9.

Weakness and fatigue are common general complaints of the geriatric population. While these may be caused by physiologic changes and general deconditioning, drug use plays a part as well.¹³ Individuals with acute or chronic illnesses may be consuming medications that make them feel tired all the time.¹³ A patient who is tired all the time will not feel like working up to his or her full potential to meet the goals of physical therapy. The patient may lack the energy to complete basic functional tasks independently or to safely complete exercise

Table 9.—Agents Causing Postural Hypotension¹³

-
- Tricyclic Antidepressants
 - Antipsychotics
 - Antihypertensive Drugs
 - Diuretics
 - Vasodilators
-

programs. It is the responsibility of the therapist to acknowledge how easily a patient is fatigued and check the chart or ask the patient about medications he or she might be taking. Examples of medications that cause weakness and fatigue are listed in Table 10.

The use or withdrawal of medications can produce depression and confusion in the elderly patient.¹³ The depressed patient may lack motivation during treatment sessions or for a successful home exercise program.¹³ Confused patients may not understand or be able to follow directions. The physical therapist will need to be enthusiastic and encouraging to enhance the patient's motivation. Positive feedback is also necessary. Written instruction, diagrams, and teaching family members may help the confused patient be successful with his or her therapy programs.

Drug-induced parkinsonism and essential tremors are involuntary movements that are of concern to the physical therapist.¹³ Symptoms produced by parkinsonism type movement include postural instability, rigidity, bradykinesia, and resting tremors.¹³ All these symptoms can create functional problems during gait, transfers, and sitting balance leading to difficulty with activities of daily living. Essential tremors involve the distal parts of the upper extremities and are usually absent at rest.¹³ These movements interfere with precision tasks involving the upper extremities and many activities of daily living. For drug-induced parkinsonism and essential tremors, the therapist will focus on movement patterns and functional tasks. Adaptation of activities of daily living

Table 10.—Agents Causing Fatigue and Weakness¹³

-
- Beta Blockers
 - Diuretics
 - Tricyclic Antidepressants
-

may need to be made. The individual may need to be appropriately fitted for a walker or other assistive device to make ambulation more functional. Chair and bed heights may need to be adjusted to make transfers easier for the individual. Assistive devices for reaching objects may simplify daily tasks and help to ensure patient safety.

Dizziness and vertigo are often related to falls. Medications can have a direct effect on a person's balance and stability. If decreased balance and stability are combined with other conditions, such as decreased peripheral neurosensation, altered gait patterns, and orthostatic hypotension, the chance of a fall occurring is magnified.¹⁴ Hip fractures are a serious complication of falls in the elderly. It is estimated that approximately 32,000 elderly individuals receive hip fractures secondary to drug-induced falls.¹⁴ Psychologically, the individual may experience fear of falling a second time which would place restrictions on his or her mobility and lifestyle.¹³ The individual may feel embarrassed about this side effect which could lead to decreased participation in social activities and isolation.¹³ The physical therapist needs to perform a thorough evaluation and execute the proper treatment plan. Physical therapy intervention should focus on static and dynamic balance activities. These are performed while sitting, standing, and with gait activities. It is also important that the physical therapist review the patient's medical profile and evaluate medications that are contributors to falls. The therapist may need to consult with the pharmacist regarding the medications the individual is taking.¹⁴

Urinary incontinence is often an embarrassing side effect that produces anxiety and distress in the individual.¹³ Motivation and confidence can become diminished during rehabilitation treatments. For example, if the patient is concerned about incontinence, it removes his or her focus from physical therapy. The person also may worry about how others perceive them. To maximize the sessions, the physical therapist should consult with the nursing staff or ask the patient to schedule their diuretic use around physical therapy sessions.¹³

Treatment Techniques and Drug Interactions

Physical therapists need to realize that some of their treatment techniques can alter drug reactions within the systems of the body.¹¹

Techniques such as exercise, physical agents, and manual therapy will be briefly considered.

Exercise can increase or decrease the amount of blood that flows to an area.¹¹ This increase or decrease can alter the therapeutic effects of the drugs. Intensity, duration, and mode need to be considered when prescribing exercise for therapeutic benefit.¹¹ Physical agents, such as heat and cold, work by changing local blood flow. Heat agents cause vasodilatation which leads to increased blood flow and drug delivery. Cold agents cause vasoconstriction, decreased blood flow, and restricted drug delivery to an area.¹¹ Manual techniques, such as massage, can increase absorption from injection sites and increase blood flow moving the drug to the tissues.¹¹ Figure 2 is a schematic

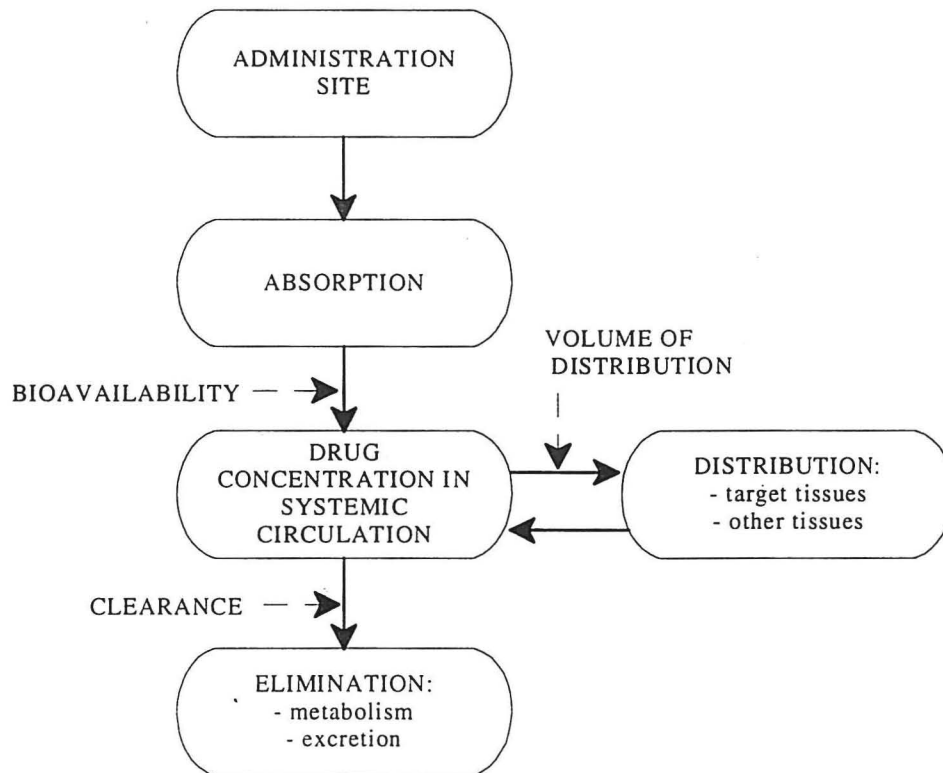


Figure 2. Schematic representation of the interrelationships among specific pharmacokinetic factors. Reprinted from Physical Therapy with the permission of the APTA: Ciccone C. Basic pharmacokinetics and the potential effect of physical therapy interventions on pharmacokinetic variables. 1995;75:343-350.

representation of the relationship among drug administration and the body processes.

Education and Communication

Finally, physical therapists have responsibilities as educators and effective communicators. Many elderly patients are unaware of the side effects that their medications can produce.¹⁵ For that reason, physical therapists must be educated about polypharmacy in order to educate patients and their families. Professional literature, continuing education courses, and contact with pharmacists and physicians will help the physical therapist broaden his or her pharmacology knowledge.¹⁵ Physical therapists will ensure a good knowledge base and make their patients feel confident in their abilities. A sound knowledge base will allow the physical therapist to refer the patient to other services if necessary, defer treatment to another individual or more appropriate time, and correctly progress a patient's treatment program.

Effective communication skills are important to the physical therapist. This includes communication with physicians, pharmacists, and patients and their families. Physical therapists often have more frequent interaction with their patients than do physicians. For that reason, therapists may receive concerns or complaints from patients regarding their medications. Contact and communication with the physician allows the physical therapist and physician to discuss these concerns. Effectively communicating with pharmacists allows for a quick reference check on medications a patient may be taking. The

pharmacist serves as a resource for questions regarding medications.

Explanations of effects and what to monitor will be important to the patient and family members.¹⁵ Discussions with the patient and family regarding effects and reactions of medications allow the therapist to make this information known to other members of the health care team. Effective communication improves patient care and also establishes credibility with other health care professionals.

This chapter has focused on the role of the physical therapist in dealing with polypharmacy. The side effects of polypharmacy and physical therapy treatments have been discussed. The importance of education and effective communication roles were also established.

CHAPTER V

CONCLUSION

This study was intended to discuss some common non-prescription and prescription medications consumed by the elderly; describe the biologic and physiologic changes that occur with age and how the changes alter medication effects; discuss the physical therapist's role in patient evaluation, treatment, and education; and discuss communication with the patient and the health care team in relation to polypharmacy. Pharmacologic information is important to the physical therapist because medications can adversely effect the individual and the physical therapy evaluation, treatment, and outcomes. This holds especially true for the geriatric patient, as they often consume multiple medications daily.

Physical therapists need a knowledge of common pharmacologic agents consumed by the elderly. This then opens a door for questions regarding physical therapy education. Is it the responsibility of the academic programs to ensure that students get a working knowledge in pharmacology or are continuing education and independent research sufficient to provide adequate knowledge? The answers to these questions are not easily determined; however, answers will impact curriculum revision and continuing education programming. Whichever route is taken can only help improve the quality of patient care that

an individual will receive. It is our responsibility to be accurate and knowledgeable in all areas that concern physical therapy. As discussed in this paper, pharmacology does impact the lives of our patients and our profession.

APPENDIX

Cathy Reuer
3400 24th Ave. S. #1109
Grand Forks, ND 58201

October 17, 1995

~~Susan L. Patterson~~
Mosby
11830 Westline Industrial Dr.
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Dear Ms. Patterson:

OCT 23 1995


I am writing to request permission to photocopy or reproduce copies of the Geriatric Nursing publication. The figure listed below would be used in my Independent study report as part of my graduate requirements for a Masters of Physical Therapy, University of North Dakota, Grand Forks, North Dakota.

Reprint request:

Geriatric Nursing
Volume 12, Number 4, July-August 1991
page 181
Title of figure: Aging Body and Drug Use

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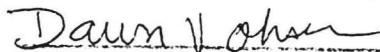
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October 18, 1995

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American Physical Therapy Association
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page 344/13
Title of figure: Schematic representation of the interrelationships among specific pharmacokinetic factors.

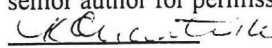
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