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Specificity of Discharge Exercise Programs and Behavioral Contracting for Physical Therapy Patients

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SPECIFICITY OF DISCHARGE EXERCISE PROGRAMS
AND
BEHAVIORAL CONTRACTING FOR PHYSICAL THERAPY PATIENTS

by

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Bachelor of Science in Physical Therapy

An Independent Study

Submitted to the Graduate Faculty of the

Department of Physical Therapy

School of Medicine

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in partial fulfillment of the requirements

for the degree of

Master of Physical Therapy



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May
1993

This Independent Study, submitted by Kevin L. Spooner 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 Chairperson of Physical Therapy under whom the work has been done and is hereby approved.


Chairperson

PERMISSION

Title Specificity of Discharge Exercise Programs
 and Behavioral Contracting for Physical
 Therapy Patients

Department Physical Therapy

Degree Master of Physical Therapy

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ABSTRACT

Adherence to discharge home exercise programs has statistically shown poor results. The purpose of this independent study is to review present-day discharge exercise programs for physical therapy, and to offer alternatives for better adherence (or compliance) and effectiveness.

A brief history of physical therapy and exercise programs is reviewed to outline the progression of the two topics. Behavioral contracting is a strategy used by health professionals to improve patient/client adherence to health regimes. The patient/client signs a contract indicating they will follow the guidelines outlined in their discharge exercise program.

Presently, the most optimal discharge exercise program involves specificity of exercise monitored by a fitness professional much as a certified strength and conditioning specialist (C.S.C.S.), along with some form of behavior contracting. More detailed studies are needed to find optimal training programs for specific long-term rehabilitation needs.

CHAPTER I

INTRODUCTION

The last decade of the twentieth century finds the medical profession pressured to produce a more cost-effective product. Decades of soaring costs have escalated the concerns of the public and alarmed politicians. Armed with newer drugs, better medical machines and research, the medical profession provides the American people with a high quality of medical care, but at an ever-increasing price. ¹

The cost of hospitalization is rising sharply, more than doubling from 1975 to 1985. The cost has increased considerably since the previous decade, and methods to curb this escalation must be identified. Systematic discharge and early discharge of patients from hospitals has been suggested. ¹ Prevention is also a key. In the past several decades, some experimentation and anecdotal evidence has been accumulated suggesting that dynamic exercise may be beneficial in the prevention and treatment of chronic and costly conditions such as obesity, cardiovascular disease, osteoporosis, and osteoarthritis. ^{2, 3, 4, 5, 6, 7, 8}

One of the best documented phenomena in sport science literature pertains to the positive effects that exercise and physical activity have on physical health. ^{2, 3, 4, 5, 6, 7} This information is now being widely disseminated to the

public through large-scale publicity campaigns and special sections of popular magazines. Health care professionals appear to be encouraging patients and consultees to become more physically active.⁹ Despite this positive trend, physical fitness promoters and researchers are faced with the very perplexing problem of short-term dropout rates in exercise programs ranging between 35% - 80%, and long-term adherence that is equally poor.^{4, 9, 10, 11, 12, 13, 14, 15, 16}

This independent study will examine post-discharge exercise programs, and the patient's adherence to recommended exercise treatment in physical therapy. The information to be gathered has both improved health and cost benefit implications. The goals of a patient's rehabilitation is not only to improve the injured area, but also to understand the cause of the injury, and to try to prevent re-occurrence. Many preventable injuries are like car maintenance, if you change oil and filters regularly, get tune ups, check brakes, tires and shocks, you may avoid major repair bills. As humans, if we properly feed our bodies, get regular check ups, and exercise regularly, we may prevent a more serious injury down the road.

This paper will focus on how to specify the exercise program while also trying to increase compliance with the program.

CHAPTER II

LITERATURE REVIEW

Medline searches were done in the following categories: history of physical therapy, history of exercise training programs, behavior modification and adherence, athletic training programs, physical fitness and health club settings. The articles all had one predominating theme, that being proper exercise programs can help heal, prevent and improve the patient's abilities. ¹⁷

The history of physical therapy was predominately taken from a book and several articles which depicted the evolution of the field during the twentieth century. Arguments can be made that physical therapy has been around since man first sustained injury, but the research shows the name "physical therapy" has been used primarily in the last century. ¹⁸

The history of exercise training programs is very extensive, with articles showing programs that were in effect thousands of years before the birth of Christ. ^{19, 20, 21} These exercise regimes were primarily for soldiers preparing for combat or competition. The science of exercise programs evolved fairly slowly until the last two to three decades of the twentieth century. The data available is vast and ongoing. ^{19, 20, 21}

Behavioral contracting is an intervention technique in which a patient signs an agreement to make certain behavioral changes within a specified time, usually with explicitly defined rewards for adherence or success. ¹⁰ The articles show that exercise programs that include behavior modification have better results and greater adherence. Since adherence or compliance is a major problem with post-discharge patients, behavior modification is a logical adjunct. ¹⁰

Many physical therapists are incorporating whole body rehabilitation, and not just working with the injured area. Because an injury can affect other parts of the body, and also because working with the whole body will provide an overflow to the injured area, a holistic approach is beneficial. Exercise programs for non-injured areas are important to stimulate whole body gains. ^{22, 23, 24, 25}

Physical therapy also has a place in health club settings. In reviewing a number of articles in which this "marriage" took place, it was shown to be of benefit for both the therapist and health club owner. A health club is an ideal setting for post-discharge physical therapy patients if it is cost effective, if it has proper equipment, and if it can provide proper professional supervision. ^{26, 27, 28, 29, 30}

CHAPTER III

HISTORY OF PHYSICAL THERAPY

This century has witnessed an explosion of specialties in the health care field. When the United States entered World War I, one medical specialty was recognized by the American Medical Association (AMA).¹⁸ A handful of other specialties were organized by the 1930s but attracted only 17 percent of all physicians to full-time specialty practice. At present, 52 specialties are recognized by the AMA and approximately 80 percent of all physicians are specialists.¹⁸ Moreover, almost every medical specialty has one or more recognized subspecialties.

Physical Therapy, like many allied health professions began as a result of World War I and continued to evolve through World War II.³¹ Major General William C. Gorgas was the Surgeon General of the United States Army when the United States declared war on Germany in 1917.³¹ At that time, no formal reconstruction program for injured persons in either military or civilian life existed in this country even though such programs were well established in some European countries.³¹ The division of Special Hospitals and Physical Reconstruction was established in the Surgeon Generals' Office on August 22, 1917.³¹ Persons assigned to this division (initially called Reconstruction Aides) not

only cared for the war injured but also set about developing educational and vocational programs as well. ³¹

The Surgeon General of the United States Army defined physiotherapy (later changed to physical therapy) as "physical measures such as are employed under physiotherapy, active exercises, indoor and outdoor games, and passive exercises in the form of massage." ³¹

On February 23, 1918, Miss Mary McMillan, the first physical therapist in this country, and, later, the first president of the American Physical Therapy Association (APTA) was assigned by the Surgeon General to the Reconstruction Aide program. ³¹ She was placed in charge of the largest training course for physical therapists (then Reconstruction Aides) at Reed College in Eugene, Oregon. ³¹

Presently the American Physical Therapy Association (APTA) presides over numerous subspecialties in the physical therapy field. Additional specialization tests by physical therapists acknowledge expertise in such areas as sports physical therapy, manual therapy, geriatrics and orthopedics among others.

CHAPTER IV

HISTORY OF EXERCISE TRAINING PROGRAMS

Exercise training programs have been used by man since early existence in order to survive the rigors of everyday life. ²⁰ Man's dependence on physical powers gradually diminished as weapons and tools were invented to make living easier. ^{19, 20}

As surplus food stores were created by human cooperation and ingenuity, a population explosion occurred. Eventually, armed conflict necessitated newer and better weapons with an emphasis on physical prowess. Soldiers exercised to improve endurance and strength during battle. ¹⁹

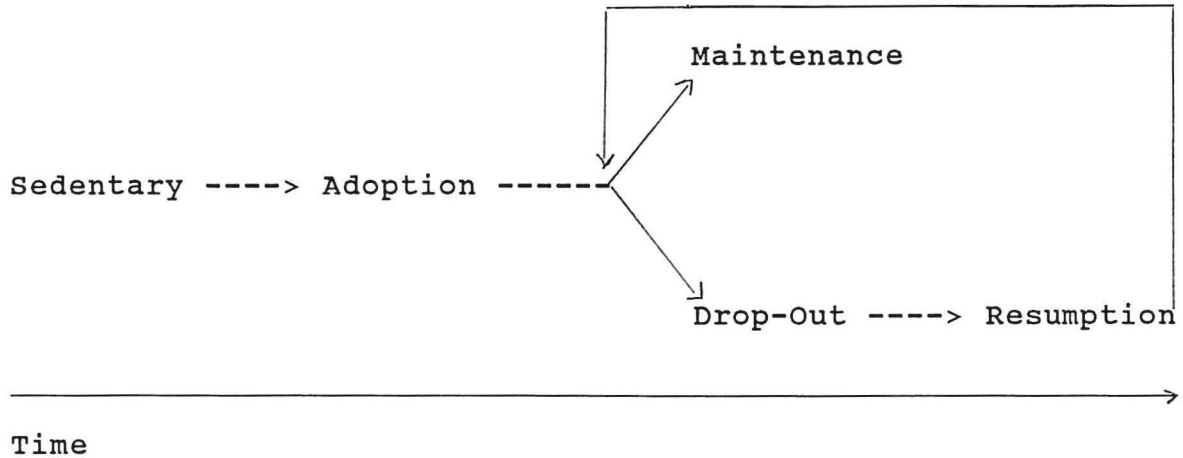
In 776 B.C. the Olympic games were founded at Elis on the Pelopennesian peninsula, and were held every four years thereafter for the next twelve centuries. ¹⁹ Foot races, chariot races, boxing and wrestling matches, archery contests, discus and javelin throwing were among the games' competitive activities. The first gymnasiums were noted in early Greek history as places for young male athletes to train for these Olympic games. ¹⁹ The use of exercise for relief of musculo-skeletal symptoms is recorded as far back in history as 1000 B.C. ²⁰ Exercise has a long standing history of improving and rehabilitating the human body.

The suggestion of a linkage between adequate exercise and occupational health dates back to Ramazzini's classical observations on cobblers and tailors.⁷ However, excessive hours of work at too high an intensity were of far greater concern in the early phases of the industrial revolution than mere health fitness or health promotion. Loss of physical condition is a more recent phenomenon, and it can be traced to automation in industry and home, progressive urbanization, and widespread use of the automobile. Exercise programs yield a healthier and more effective labor force, and major corporations have thus followed the government's lead in developing fitness and health promotional facilities as a part of personnel or occupational health departments.⁷

Table I shows a simplified diagram of the four major phases of the natural history of exercise. Research on exercise determinants seeks to predict and explain the three transitions between exercise phases.²³ People will be distributed across all stages of the model at any given time, but because the vast majority of adults in industrialized countries are currently sedentary, it is reasonable to assume that sedentary behavior is the baseline state.

TABLE I

4 Major Phases of the Natural History of Exercise



The three transitions are:

1. SEDENTARY ----> ADOPTION. The first transition is from being a non-exerciser to being an exerciser, however defined. Using continuous variables, one could specify an increase in exercise behavior. Given that less than 10% of the U.S. adult population engages in sufficient vigorous exercise to produce increases in cardiovascular fitness and maximum protection from chronic diseases, this transition point may be the most important. However, the determinants of adoption of exercise have seldom been studied.

2. ADOPTION ----> DROP-OUT OR MAINTENANCE. There is widespread agreement that exercise must be practiced consistently for the health and fitness benefits to be achieved. However, there is substantial evidence to indicate that of those people who adopt regular

exercise, approximately 50% drop-out within one year. This percentage appears to apply to clinical cardiac rehabilitation patients and to the general population. The high rate of drop-out is clearly an important issue, especially because few people seem to be adopting exercise. The bulk of the exercise determinants research has focused on this transition.

3. DROP-OUT ----> RESUMPTION. Not everyone who drops out of exercise remains sedentary. Some unknown proportion of drop-outs resume exercise. This transition has been almost totally ignored, but it may be very important to know how dynamic the exercise cycle is. If many people start and stop exercise programs several times over their lifetimes, then exercise interventions need to focus on shortening the interval between drop-out and resumption. If very few drop-outs resume exercise, that suggests that more intervention should be directed to preventing drop-out.

CHAPTER V

BEHAVIOR CONTRACTING

Non-adherence to discharge exercise programs has been well documented with ranges from 30% to 93% in a number of studies. ^{4, 5, 9, 10, 12, 13, 14, 17} The term "adherence" rather than "compliance" is more frequently used in the studies because the former term denotes an interactive relationship between patient and health care provider, while the latter suggests a more authoritarian relationship. ¹⁴

Behavioral contracting is a strategy used increasingly by health professionals to improve patient adherence to health regimens. Also called contingency contracting, this technique derives its theoretical rationale from social learning theory. ¹⁰ A behavioral contract is a signed, written agreement, in which the target behaviors to be changed are explicitly detailed. In order to be effective, the terms of the contract must be both observable and measurable, with a specified reward that is given upon successful completion of contract obligations. Behavioral contracting has been successfully used in a variety of health behavior change programs such as exercise adherence, hypertension control, smoking cessation, and weight loss. Its effectiveness may reflect the interplay of the self-selection of those with a deep motivation or commitment

toward the targeted behavior change, and also its tendency to increase motivation and persistence toward goals achievement. Contracting is a behavior change strategy which is familiar to health educators and psychologists.¹⁰ It is also a tool available to the family physician who has sustained continuity of care with patients needing assistance in making beneficial lifestyle changes.¹⁰

The introduction of the behavioral contract strategy into routine discussions of modifiable health behaviors, such as the need for exercise, diet modification, smoking cessation or medication compliance, does not require extensive time or materials. Contract signing can provide a useful structure of behavior-change goals setting, the progress toward which can be discussed and evaluated in subsequent patient visits or contracts. A generic example of a standard behavioral contract is shown in Appendix I. While some sort of reward structure based on behavior change achievements seems to be helpful in focusing patient motivation, even rewards of a modest nature can be effective. Research on the nature of nominal rewards suggest that rewards defined by individual patients (such as making a desired purchase, or engaging in some valued restful, social or recreational activity) are also effective.¹⁰

Contract signers stated that the signing of the contract with its explicit goals enhanced their motivation to improve their health risk profile. The self-monitoring

and self-reinforcement is frequently mentioned as helpful in maintaining the publicly-stated commitment outlined in the contract. Unwillingness to sign contracts seemed to be related to three factors: apprehension concerning the meaning or implication of contract signing; the belief that they were already exercising sufficiently; or the belief that they did not need the motivation of the contract to achieve the desired behavior change.¹⁰ In spite of these limitations, it appears that behavioral contracting is a feasible and acceptable intervention tool for health promotion activities.¹⁰

CHAPTER VI

DISCHARGE FROM PHYSICAL THERAPY

As indicated in the section on behavior modification, home programs have shown poor adherence. ^{4, 5, 9, 10, 12, 13, 14, 17} Current economic pressures are requiring health professionals to limit the patients' stay in a hospital, rehabilitation clinic, or other medical situation before the patient has reached full recovery. ³⁰ If a patient's short-term goals are achieved while he/she is undergoing treatment, then the long-term goals are more than likely going to be carried out independently. Combining this information with the fact that patients have poor adherence to home programs, it is highly logical that a former patient should seek further assistance in the health-fitness field to obtain the long-term goals. This can be done at fitness centers that are qualified and capable of working with "quasi-patients". ^{25, 26, 29, 31, 32} A good fitness program is always based on an integration of the clients' medical history, fitness testing results, and goals and objectives of the client him/herself.

History of Patient

The first step in setting up an ongoing exercise program for a discharged physical therapy patient is an initial interview with the fitness professional. A medical

history should be taken by use of a questionnaire (see Appendix II). A thorough history, current medications, health risks such as smoking and other injuries, and physician findings from previous physicals.

Test and Measurements

Objective measurements are important in evaluating a client for a program. To assess a change in an individual fitness profile, a few simple tests and measurements can be taken to provide a comparative study during the re-evaluation. These include circumference of extremities and torso measurements, blood pressure, body fat test, flexibility, and strength tests. ^{33, 35}

Extremity measurements should be taken bilaterally to find any discrepancies. Any significant differences in measurements may indicate an old injury, or possibly an overuse of the dominant extremity. The person should be aware of the differences and his/her program adjusted accordingly. Trunk measurements should be taken to show losses or gains in circumference during the re-evaluation.

Blood pressure is most easily taken with an automatic inflatable cuff that digitally displays blood pressure and pulse. If there are indications that the blood pressure needs to be monitored, then the fitness professional should have the clients blood pressure taken before and after workouts. Also, the clients target heart zone should be identified and discussed with the patient.

The skin fold method of measuring body fat is a more practical, economical and administratively feasible method compared to hydrostatic weighing or bioelectrical impedance.³⁶ It involves measuring the skin fold thickness at specific sites on the body. The sites include biceps/triceps, iliac crest, and sub scapula.

The sit-and-reach test is a lower extremity and trunk test for flexibility.³⁵ Range of motion and shoulder flexibility can be measured to assess upper extremity mobility.

Implementation

After taking the patient's history and evaluating the person for a program, the training variables need to be addressed to properly institute a program that includes appropriate intensity, duration, frequency, choice, and order of exercise and administrative variables.^{15, 37, 38, 39}

Intensity is the tension or stress put on the muscle.⁴⁰ It is dependent on the number of sets and reps (repetitions), rest between sets, and the amount of weight or load being used.^{40, 41, 42} Intensity is relative; what is intense for one person may be easy for another. Because of this, intensity in exercises is based on percentage of the individuals' 1RM (the most weight he can do in one repetition).⁴⁰ For a muscle to get stronger it has to be overloaded. Overloaded means putting stress (amount of weight or load) on the muscle greater than what it is used to.⁴⁰

Duration is the time the exercise is performed in a single session. ^{43, 44} This should be adjusted for both the cardiovascular and strengthening parts of the programs. It is very important to allot sufficient time before and after the program for proper warm up and cool down. A warm up includes elevating the heart rate from resting to the target rate. Warm up also includes various flexibility exercises. Stretching is the key to increasing flexibility. ⁴⁴ Stretching is essential to the joints, muscles and connective tissue. All stretching movements should be done slowly and smoothly. ⁴⁴ A cool down should decrease the heart rate from exercise levels down to close to resting rate. ^{43, 44}

Frequency is the number of sessions per week or month that the exercise regime is performed. ^{40, 41, 42} The amount of rest required between training sessions depends on the recovery ability of the individual. Usually, three workouts per week are found to allow adequate recovery, especially for the novice. ^{40, 41, 43, 44}

The choice and order of exercise includes whether exercises should be done from large muscle groups to small muscle groups, from lower extremity to upper extremity, from multi-joint to single joint exercises, or vice versa. ⁴¹ This is important for two reasons. One, working the largest muscles first causes the greatest degree of overall body stimulation. Two, it is impossible to reach the required condition of momentary muscular exhaustion in a large muscle

is the smaller muscle groups serving as a link have been previously exhausted. ^{44, 45}

Administrative variables include equipment available, time available, and proper instructors. Equipment that was used in rehabilitation also can be found in health clubs so the client can be familiar with the machines. ⁷⁸ If the equipment recommended by the physical therapist at discharge cannot be found then adjustments will be needed. Time is an administration variable as well as a patient variable. Proper instruction should be available during the times the client is able to exercise. The fitness program needs to be overseen by a properly trained person in the fitness industry. ⁷⁸

Re-Evaluation

A definite date for re-evaluation should be set at the initial interview. Typical re-evaluation dates are at one, three and six month intervals. ³³

During the re-evaluation, the tests and measurements are performed and compared to the initial evaluation. This objective data will enable the physical therapist or the conditioning specialist to adjust the program for more optimum results.

Re-evaluations are also excellent times to modify and redesign the behavior contract. ^{10, 33} Since behavior contracting increases adherence to exercise programs, consistent reinforcement of the contracting procedure will reinforce adherence to the exercise program. ^{10, 33}

Re-evaluations are a vital part of an ongoing exercise program. Efforts should be made by both the client and fitness supervisor for consistent re-evaluations.

CHAPTER VII

DISCUSSION

The paper explored the possibilities of specific exercise programs for discharged physical therapy patients. Adherence to exercise programs can be improved by using behavior contracting for specific exercises and re-evaluations. By finding better techniques for adherence to discharge exercise programs, preventive care is enhanced and overall health care costs lowered.

Health care problems are being brought to the forefront of national issues. Health care reform will affect each of us. A proper balance between optimal care and controllable costs is essential in solving the health care crisis.

APPENDIX I

Generic Behavioral Contract Form

My Goal is to _____

(Fill in desired behavior changes)

By _____

(fill in date)

By doing the following _____

(fill in behavioral changes)

My reward for completing the behavior changes by the set

date is _____

Name: _____

Signature: _____ Date: _____

Witness: _____ Date: _____

APPENDIX II

MEDICAL SCREENING QUESTIONNAIRE

Answer Yes or No to each question.

1. Have you experienced any of the following conditions (past and present)?

| | Yes | No | | Yes | No | | Yes | No |
|--------------|-----|-----|---------------|-----|-----|---------------|-----|-----|
| Epilepsy | ___ | ___ | Heart Disease | ___ | ___ | Lung Disorder | ___ | ___ |
| Shortness of | | | Recent Weight | | | High Blood | | |
| Breath | ___ | ___ | Loss/Gain | ___ | ___ | Pressure | ___ | ___ |
| Dizziness | ___ | ___ | Allergies | ___ | ___ | Back Injury | ___ | ___ |
| Diabetes | ___ | ___ | Blackouts | ___ | ___ | Foot/Ankle | ___ | ___ |
| Chest pain | | | Knee | | | Injury | ___ | ___ |
| during | | | Instability | ___ | ___ | Other | ___ | ___ |
| exercise | ___ | ___ | | | | | | |

If you answered Yes to any of the questions, or have a family history of any of the above conditions, consulting a physician would be in your best interest before beginning your fitness program.

2. Are you presently taking medications? _____ What kind? _____

3. When was the last time you had a complete physical examination? _____

4. If you smoke, how many cigarettes per day? _____

5. What type of exercise program are you presently doing and how often? _____

6. What is your occupation? _____

7. Name of your physician _____

8. Person to notify in case of emergency:

Name _____

Address _____

Phone _____

Date _____

Signature _____

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