David Newberry, Kurt Kaufman & John Baker

TEACH COACH PLAY

Skills, Drills & Strategies for

Strength Training

The TEACH COACH PLAY Series

TRACY L. PELLETT • JACK RUTHERFORD • CLAUDIA BLACKMAN
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Preface

WELCOME TO THE *TEACH, COACH, PLAY* SERIES

The books in the *Teach, Coach, Play* series emphasize a systematic learning approach to sports and activities. Both visual and verbal information are presented so that you can easily understand the material and improve your performance.

Built-in learning aids help you master each skill in a step-by-step manner. Using the cues, summaries, skills, drills, and illustrations will help you build a solid foundation for safe and effective participation now and in the future.

This text is designed to illustrate correct techniques and demonstrate how to achieve optimal results. Take a few minutes to become familiar with the textbook's organization and features. Knowing what to expect and where to look for material will help you get the most out of the textbook, your practice time, and this course.

TO THE INSTRUCTOR

Your needs are changing, your courses are changing, your students are changing, and the demands from your administration are changing. By setting out to create a series of books that addresses many of these changes, we've created a series that:

- Provides complete, consistent coverage of each sport—the basics through skills and drills to game strategies so you can meet the needs of majors and non-majors alike.
- Includes teaching materials so that new and recently assigned instructors have the resources they need to teach the course.
- Allows you to cover exactly the sports and activities you want with the depth of coverage you want.

What's in the *Teach, Coach, Play* Series?

- Nine activities:
  - Skills, Drills, & Strategies for Badminton
  - Skills, Drills, & Strategies for Basketball
  - Skills, Drills, & Strategies for Bowling
  - Skills, Drills, & Strategies for Golf

Skills, Drills, & Strategies for Racquetball
Skills, Drills, & Strategies for Strength Training
Skills, Drills, & Strategies for Swimming
Skills, Drills, & Strategies for Tennis
Skills, Drills, & Strategies for Volleyball

- Accompanying Instructor's Manuals

What's in the Student *Teach, Coach, Play* Textbooks?

The basic approach in all of the *Teach, Coach, Play* activity titles is to help students improve their skills and performance by building mastery from simple to complex levels.

The basic organization in each textbook is as follows:

Section 1 overviews history, organizations and publications, conditioning activities, safety, warm-up suggestions, and equipment.

Section 2 covers exercises or skills, participants, action involved, rules, facility or field, scoring, and etiquette.

Section 3 focuses on skills and drills or program design.

Section 4 addresses a broad range of strategies specifically designed to improve performance now and in the future.

Section 5 provides a convenient glossary of terms.

Supplements to Support You and Your Students

The *Teach, Coach, Play* books provide useful and practical instructional tools. Each activity is supported by its own manual. Each of these instructor's manuals includes classroom management notes, safety guidelines, teaching tips, ideas for inclusion of students with special needs, drills, lesson plans, evaluation notes, test bank, and a list of resources for you.

About the Authors

David Newberry received a Bachelor of Science degree in Sport Studies from West London Institute and a Master of Science in Education degree from Southern Illinois University Edwardsville. Currently, he is teaching at Newman College of Higher Education in London. He has worked in the broad area of fitness for the past 10 years, but his prime interest is in the sport of soccer, in which he has participated as an amateur and semi-professional player and for which he coaches in Great Britain as an FA certified coach.

Kurt Kaufman received a Bachelor of Science degree in Kinesiology from the University of Illinois and a Master of Science degree from Southern Illinois University Edwardsville. His prime interest is the field of fitness, and he is a certified strength and conditioning specialist. He has worked as a fitness director at a Nautilus Fitness/Racquet Center, as a personal trainer, and presently is strength coach for Hammer Bodies Fitness Clinic in St. Louis, Missouri. He resides in Godfrey, Illinois.

John Baker is a professor and chairperson of the Department of Kinesiology and Health Education at Southern Illinois University Edwardsville. He obtained his teacher certification in physical education at Loughborough College in England and a Master of Arts and Doctor of Philosophy from The University of Iowa. He played professional rugby in France, is an ardent tennis player and golfer, and has competed recreationally as a marathon runner. Dr. Baker's interest in and practice of weight training has been an integral part of all of these activities. He resides in Edwardsville, Illinois.

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SECTION

Preliminaries

1

WEIGHT TRAINING: HISTORY, BENEFITS, AND MISCONCEPTIONS

After reading this section, the student will be able to do the following:

- Describe the origins of weight training and understand how it has progressed
- Understand the physical benefits associated with weight training
- Understand how weight training can increase the wellness of life
- Resolve common misconceptions regarding weight training

This section of the text begins with a brief account of the history of weight training, followed by the physical and wellness benefits of lifting, and a discussion of popular misconceptions. A number of commonly asked questions also are presented, and answers are provided. This section concludes with a list of prominent organizations that provide training courses, instructional and academic journals, and conferences for the weight training industry.

History of Weight Training

The origins of weight training are not known but since the beginning of time people have exercised with weights in various forms, resulting in larger and stronger muscles. The first recorded use of weights was the ancient Greeks lifting large stones as a way of showing superior strength. Many historians believe that this was the first recording of weight training as a competitive sport. Later, in the first and second century A.D., the Greek historian Epictetus also wrote of athletes using heavy stones called **pestles** to train for competitive events. The pestle was a carved stone with a thin handle, rounded on one end, that resembled the modern day dumbbell.

pestle type of stone used by the Greeks in weight training that resembles the modern-day dumbbell

The ancient Egyptian military used weight lifting, running, jumping, and mock fighting to increase strength and agility in their everyday training. Many of the civilian lower classes also used weight lifting as a means of increasing their strength, which was deemed essential for their everyday work.

The Romans participated in weight lifting contests for both men and women in the Actian Games as early as the ninth century A.D. Like the Egyptians, the Romans also used weight lifting as a way of training their military. The leaders of the

empire encouraged soldiers to engage in the lifting of weights, running, and swimming to ready themselves for battle. Many of the Roman philosophers became interested in the wholesome effects that exercise had on people, and Galen detailed the first theories of training when he wrote of how to quantify exercise by a change in breathing habits, how exercise calmed the nerves, and of the benefits of being coached in exercise.

There is little recorded history of weight training from the time of the Roman Empire until the formation of the modern Olympic Games, in 1896, when weight lifting became part of the training regimen of athletes. From this time, scientists, athletes, and coaches have investigated the benefits associated with weight training and how to optimize performance.

The biggest changes in the style and procedures of weight training have occurred during the last 50 years. After World War II, scientists began to explore how weight training developed the body. This scientific approach enabled athletes and coaches to see the benefits that weight training possessed and the importance of training the entire body instead of only the muscles used in their performance. Before this time, coaches believed that working with weights had detrimental effects on an athlete's performance.

With the fitness boom of the 1970s, the benefits of weight training were seen for a larger population, not only to increase muscular size and strength, but as a companion of cardiovascular exercise to improve overall fitness.

Physical Benefits of Weight Training

The benefits of physical fitness can be broken down into five components: (a) cardiovascular (aerobic) endurance, (b) muscular strength and size, (c) muscular endurance, (d) flexibility and joint stability, and (e) body composition.

Cardiovascular Endurance

cardiovascular endurance ability of the lungs, heart, and blood vessels to deliver oxygen to the body during prolonged physical activity

Cardiovascular endurance refers to the ability of the lungs, heart, and blood vessels to deliver oxygen to the body during prolonged physical activity. Activities that aid in increasing cardiovascular endurance include walking, jogging, biking, rowing, and cross-country skiing. Such activities keep the heart rate elevated for long periods of time. Cardiovascular endurance also may be improved through weight training as long as the sessions are of sufficient volume and intensity.

Muscular Strength and Size

muscular strength amount of force a muscle can exert against a resistance in one maximal effort

hypertrophy increase in muscle mass caused by increasing the size and number of muscle cells

One of the most noticeable physical changes associated with weight training is an increase in **muscular strength** that can be defined as the amount of force a muscle can exert against a resistance in one maximal effort. Muscular strength is associated with **hypertrophy**, which is the increase in muscle mass caused by increasing the size and number of muscle cells. Hypertrophy provides muscles with the ability to store and use more force than was previously present.

Muscular Endurance

muscular endurance ability of muscles to persist in exerting a force over a period of time

Muscular endurance refers to the ability of the muscles to exert force over a period of time. Through weight training, the muscles are able to use oxygen more efficiently for an extended duration. Since more oxygen becomes available, muscles can create force and withstand it for a longer period of time. Muscular endurance is especially important to people who participate in such athletic events as distance running, bicycling, and soccer.

Flexibility and Joint Stability

It generally is believed that weight training causes muscles to become stiff and partially immobile. Recent studies, however, have shown that with proper exercise, the **flexibility** of a muscle can be increased. Flexibility refers to the range of movement around a joint. Since tendons, which secure the muscle to the bone, run across bone joints, an increase in muscular size and strength also allows the tendons to become stronger and make the joint more stable. This helps in guarding against injuries such as a **dislocation,** in which bones become separated at a joint.

flexibility *possible range of movement of a joint and the surrounding muscle*

dislocation *injury in which the bones are separated at a joint*

Body Composition

Body composition is a term used to describe the amount of fat and nonfat components of muscles, organs, bones, and fluids that make up the body. Body composition is usually described as the percentage of body fat weight in regard to the total amount of weight of an individual. For example, if an individual is 150 pounds of which 30 pounds is fat, the individual is said to have a body fat percentage of 20. Table 1.1 shows the average range of body fat for males and females. As stated before, as an individual becomes stronger through weight training, the muscle cells increase in size. As this happens, they will occupy a larger percentage of the body and thus cause the percentage of body fat to decrease. Body fat percentage also decreases as the body uses fat reserves for additional energy.

body composition *amount of fat and nonfat components that make up the body*

Two other benefits of weight training that are not directly related to the four components of physical fitness are the body's abilities to increase its metabolic rate and to increase its bone strength and density.

TABLE 1.1 Body composition classification according to percent body fat.

MEN					
Age	**Excellent**	**Good**	**Moderate**	**Overweight**	**Significantly Overweight**
≤19	12.0	12.1–17.0	17.1–22.0	22.1–27.0	≥27.1
20–29	13.0	13.1–18.0	18.1–23.0	23.1–28.0	≥28.1
30–39	14.0	14.1–19.0	19.1–24.0	24.1–29.0	≥29.1
40–49	15.0	15.1–20.0	20.1–25.0	25.1–30.0	≥30.1
≥50	16.0	16.1–21.0	21.1–26.0	26.1–31.0	≥31.1
WOMEN					
Age	**Excellent**	**Good**	**Moderate**	**Overweight**	**Significantly Overweight**
≤19	17.0	17.1–22.0	22.1–27.0	27.1–32.0	≥32.1
20–29	18.0	18.1–23.0	23.1–28.0	28.1–33.0	≥33.1
30–39	19.0	19.1–24.0	24.1–29.0	29.1–34.0	≥34.1
40–49	20.0	20.1–25.0	25.1–30.0	30.1–35.0	≥35.1
≥50	21.0	21.1–26.0	26.1–31.0	31.1–36.0	≥36.1

Metabolic Rate

nutrients compounds used by the body to provide energy and to aid in growth and repair

The food we eat is made up of **nutrients** that are responsible for providing the energy needed by the body, as well as helping with its growth and repair. Nutrients are classified as carbohydrates, fat, protein, vitamins, minerals, or water. Of these, the first three are the primary fuels that provide the body with its energy. Excess energy intake is stored in the form of fat, no matter which nutrient provides the excess.

metabolism rate at which the body uses energy

The rate at which the body uses energy is referred to as its **metabolism**. This is greatly affected by weight training since muscles are constantly in use, and the demand for energy is great. With an increase in the size of muscle cells as a result of weight training, the body needs more energy to accomplish its everyday activities. This increased need for energy speeds up the body's metabolism to produce energy faster and more efficiently and also to allow the body to use the stored fat.

Bone Strength and Density

bone strength amount of force that bones are able to withstand

The stress placed on bones during weight training causes them to become stronger. Since weight training applies more force than the body is accustomed to, it must adapt by making the bones stronger and able to withstand a greater amount of force. **Bone Strength** is obtained primarily through an increase in **bone mineral density,** which refers to the amount of mineral deposited in a given area of bone. The greater the density of mineral in the bone, the more stress it is able to withstand. Conversely, loss in bone mineral density weakens the bone, resulting in a condition called **osteoporosis**.

bone mineral density amount of mineral deposited in a given area of bone

osteoporosis loss in bone mineral density and subsequent weakening of bone

Wellness Benefits of Weight Training

wellness constant and deliberate effort to stay healthy and achieve the highest potential for well-being

Besides the physical well-being associated with weight training, the entire **wellness** of an individual will benefit from a structured program. Wellness is defined as the constant and deliberate effort to stay healthy and achieve the highest potential for well-being. As well as physical fitness, the mental, social, and emotional aspects of life are included in this total wellness. Weight training also will aid in enhancing these aspects of an individual's well-being.

A proper weight training program requires a person to understand how the body functions, responds, and adapts to exercise. Logical planning, self-discipline, self-analysis, and problem-solving skills are required to endure a safe and effective weight training program. This type of program also provides the opportunity to develop positive social qualities. Sharing, caring, encouraging, and helping behaviors are developed while training in a group environment. Unlike other sporting events, weight training allows each participant to be a winner and provides results that are both positive and noticeable. Weight training also can be seen as a means of bringing a group of people together who communicate on a common topic. Research has shown that muscular tension will decrease following a single bout of exercise, thus releasing physical and mental stress, which helps increase a person's self-esteem, physical self-image, overall health, and attitude.

Common Misconceptions Concerning Weight Training

The inception of weight training as a useful tool has generated many misconceptions largely because of "experts" who unwillingly give poor advice to people beginning a weight training program. Before seeking assistance with a weight training program, participants should check the background of instructors to make sure that they are qualified to provide safe and knowledgeable instruction.

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