

1. Record Nr.	UNINA9910506387303321
Autore	Muñoz-López Alejandro
Titolo	Resistance Training Methods : From Theory to Practice
Pubbl/distr/stampa	Cham : , : Springer International Publishing AG, , 2021 ©2022
ISBN	3-030-81989-2
Descrizione fisica	1 online resource (384 pages)
Collana	Lecture Notes in Bioengineering Ser.
Altri autori (Persone)	TaiarRedha SañudoBorja
Soggetti	Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- About This Book -- Contents -- Editors and Contributors -- Resistance Training Foundations -- 1 Applied Physics to Understand Resistance Training -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1 Fundaments of Mechanics -- 2.2 Fundaments of Energy Physics -- 2.3 Physical Working Principle of Training Devices -- 2.4 Fundaments of Data Acquisition -- 2.5 Data Filtering -- 3 From Practice -- 3.1 Measuring Training Variables -- 3.2 Acquiring Training Variables -- 3.3 Practical Considerations on Machine Technologies -- 3.4 Physics of Eccentric Overload -- 3.5 Physics of Pulleys -- 4 Filling Gaps -- 5 Take Home Messages -- References -- 2 Muscle Strength Determinants and Physiological Adaptations -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1 Neurological Responses and Adaptations -- 2.2 Musculoskeletal System Responses and Adaptations -- 2.2.1 Skeletal System (Bone, Cartilage, and Ligament) -- Bone Mass -- Cartilage and Ligaments -- 2.2.2 Muscular System (Tendons and Skeletal Muscle) -- Tendons -- Skeletal Muscle -- Molecular Response to Resistance Training for Skeletal Muscle Hypertrophy: mTOR Signaling Pathway -- 2.2.3 Cardiorespiratory Responses and Adaptations -- 2.2.4 Endocrine Responses and Adaptations -- 3 From Practice -- 3.1 Neurological Responses and Adaptations -- 3.2 Musculoskeletal Responses and Adaptations -- 3.3 Cardiorespiratory Responses and Adaptations -- 3.4 Endocrine Responses and Adaptations -- 4 Filling

Gaps -- 5 Take Home Messages and Practical Resources -- References
 -- 3 Kinetic and Kinematic Analysis for Exercise Design: A Practical
 Approach -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1
 Force-time Curve (C f-t) -- 2.2 Force-Velocity (C f-V) and Force-
 Velocity-Power Curve (C f-V-P) -- 3 From Practice -- 3.1 Flywheel
 Devices (FW) -- 3.2 Ballistic Push-Off Loaded Actions (BPLA).
 3.3 Variable Resistance Training Systems (VRTS) -- 4 Filling Gaps -- 5
 Take-Home Messages -- References -- 4 Equipment and Training
 Devices -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1 Free-
 Weight Training -- 2.2 Bodyweight Training -- 2.3 Rotary Inertial
 Devices -- 2.4 Variable Resistance Training -- 3 From Practice -- 3.1
 Free-Weight Training -- 3.2 Bodyweight Training -- 3.3 Rotary Inertial
 Devices -- 3.4 Variable Resistance Training -- 4 Filling Gaps -- 5
 Take-Home Messages and Practical Resources -- References --
 Developing and Building Training Paradigms -- 5 Resistance Training
 for the Maximisation of the Vertical Force Production: Jumps --
 Abstract -- 1 Introduction -- 2 From Theory -- 2.1 The Development
 of Plyometric Training: What is Plyometrics? -- 2.2 General Effects of
 Plyometric -- 2.3 Stretch-Shortening Cycle (SSC) -- 2.4 Determining
 Factors of Plyometric Performance -- 3 From Practice -- 3.1
 Application of Plyometric-Jump Training in Sports -- 3.2 Applications
 of Plyometric-Jump Training for Physical Fitness and Health -- 3.3
 Factors Associated with Plyometric-Jump Training Effectivity -- 4 Filling
 Gaps -- 4.1 Physical Maturity of the Athlete -- 4.2 Coachability -- 4.3
 Demands of the Sport -- 4.4 Fitness Level -- 4.5 Other Factors -- 5
 Take-Home Messages -- References -- 6 Resistance Training for the
 Maximization of the Horizontal Force Production -- Abstract -- 1
 Introduction -- 2 From Theory -- 2.1 Understanding the Sprint-
 Velocity-time Curve -- 2.2 Muscular Implications and Forces During a
 Sprint -- 3 From Practice -- 3.1 Sprint Practice -- 3.2 Sprint Coaching
 Philosophy -- 3.3 Training in the Speed-Endurance Continuum -- 3.3.1
 Sprint Speed Training -- 3.3.2 Sprint Speed Endurance Training --
 3.3.3 Training in the Speed-Strength Continuum -- 3.3.4 Lifting
 Weights -- 3.3.5 Jumping and Throwing.
 3.3.6 Resisted and Assisted Sprinting -- 3.4 Training Weekly Schedule
 -- 4 Filling Gaps -- 5 Take Home Messages and Practical Resources --
 References -- 7 Resistance Training Using Flywheel Resistance Training
 Devices -- Abstract -- 1 Introduction -- 1.1 Theoretical Background --
 2 From Practice -- 3 Filling Gaps -- References -- 8 Variable
 Resistance Training Methods -- Abstract -- 1 Introduction -- 2 From
 Theory -- 3 From Practice -- 4 Filling Gaps -- 4.1 Determining What
 Type of Variable Resistance Training Device to Use -- 4.2 Considering
 the Planes and Force Vectors When Designing the Task -- 4.3
 Managing Non-conventional Variables During the Execution of the Task
 -- 4.4 Vector Diversification -- 5 Take-Home Messages and Practical
 Resources -- References -- Monitoring Training and Testing -- 9
 Velocity-Based Training for Monitoring Training Load and Assessing
 Training Effects -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1
 Lifting at Maximal Velocity is the Essential Premise of Velocity-Based
 Training -- 2.2 Using Movement Velocity to Determine Loading
 Intensity -- 2.3 Using Movement Velocity as a Measure of Level of
 Effort Within the Set -- 2.4 Effort Index as a New Method to Quantify
 Training Load During Resistance Training -- 3 From Practice -- 3.1
 How the Use of Movement Velocity as a Measure of Training Intensity
 Can Be Easily Implemented on a Daily Basis -- 3.1.1 Individual Load-
 Velocity Relationship -- 3.1.2 Using Bar Velocity on a Daily Basis -- 3.2
 Effects of Different Velocity Loss Thresholds During Resistance Training
 -- 3.3 How the Use of Movement Velocity as a Measure of Level of

Effort Can Be Practically Implemented on a Daily Basis -- 4 Filling Gaps -- 4.1 Programming Using Velocity-Based Training -- 4.2 How to Design Concurrent Training Implementing the Velocity-Based Training Approach -- 5 Take-Home Messages -- References.

10 Measuring and Testing with Flywheel Resistance Training Devices -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1 Flywheel Training Paradigm Components to be Considered -- 2.2 Flywheel Overloading Profile -- 2.3 Typical Mechanical Variables Used -- 2.4 Where to Focus Attention -- 3 From Practice -- 3.1 Progressive Loading Testing -- 3.2 Eccentric Overload -- 3.3 Movement Variability -- 3.4 Real-Time Monitoring Decisions -- 4 Filling Gaps -- 4.1 In Relation to the Training Intensity -- 4.2 How to Effectively Achieve Eccentric Overload -- 5 Take-Home Messages and Practical Resources -- References --

11 How to Use Force Sensors for Resistance Training in Daily Practice -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1 Why Force Plates Are a Good Device to Assess Resistance Training? -- 2.2 How to Analyse Vertical Force-Time Data? -- 3 From Practice -- 3.1 How to Measure Vertical Resistance Training Exercises with Force Plates? -- 3.2 Ballistics Tests with Force Plates-The Countermovement Jump (CMJ) -- 4 Filling Gaps -- 5 Take Home Messages -- References --

Program Design and Periodization: Combining Strategies -- 12 Basics of Programming and Periodization in Resistance Training -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1 What is Periodization? -- 2.2 Physiological Bases of Periodization -- 2.2.1 Training Variation -- 2.2.2 Sport Specificity -- 2.3 Basic Principles of Periodization -- 2.4 Objectives of Periodization -- 2.4.1 Improvements in Strength -- 2.4.2 Hypertrophy -- 2.5 Why Use Periodization? -- 2.6 Types of Models of Periodization -- 2.6.1 Linear Periodization -- 2.6.2 Undulating Periodization -- 2.6.3 Block Periodization -- 3 From Practice -- 3.1 Many Coaches, Many Methods -- 3.2 Sequential Periodization Method -- 3.2.1 Long Linear Method -- 3.2.2 Short Linear Method -- 3.2.3 Hybrids Between Long and Short Variations. -- 3.3 Concurrent Method of Periodization -- 3.3.1 Ordinary Concurrent Method -- 3.3.2 Emphasised Concurrent Method -- 3.4 Conjugate Sequence Periodization Method -- 3.4.1 Short Conjugate Sequence Method -- 3.4.2 Long Conjugate Sequence Method -- 4 Filling Gaps -- 5 Take-Home Messages -- References --

13 Programming and Periodisation for Team Sports -- Abstract -- 1 Introduction -- 2 From Theory -- 2.1 The Optimal Dose-Response Relationship for Strength Training in Team Sports -- 2.2 Strength Training Scheduled During Different Microcycles -- 2.3 The Most Common Strength Training Exercises Used and Optimal Training Load -- 3 From Practice -- 3.1 Detraining Period (Off-Season) -- 3.2 Retraining Period (Pre-Season) -- 3.3 In-Season Period -- 4 Filling Gaps -- 5 Take-Home Messages -- References --

14 Programing and Periodization for Individual Sports -- Abstract -- 1 Introduction -- 2 From Theory -- 3 From Practice -- 3.1 The Organization of Strength Training in Individual Sports and the Use of Velocity-Based Training for the Prescription and Control of Training -- 3.2 Strength Training Assessment -- 3.2.1 Maximum Strength -- 3.2.2 Force-time, Power and Force-velocity Profile as a Tool for Periodization in Individual Sports -- 3.2.3 Rate of Force Development and Force-velocity Profile -- 3.2.4 Stretch Shortening Cycle -- 4 Filling Gaps -- 4.1 Biomarkers and Sports Performance: Physiology and Biochemistry Applied to Training Control and Prescription (New Periodization Models) -- 4.2 Adjustments and Monitoring of Training Sessions with Control by Lactate and Glycemia -- 4.3 New Proposal About Periodization -- 4.4 Monitoring and Control Indications for Each Momentum of the Bioflexible Periodization -- 4.4.1 Strength

Momentum -- 4.4.2 Resistance Momentum -- 4.4.3 Transition
Momentum -- 4.4.4 Power Momentum -- 5 Take-Home Messages --
References.

15 The Role of Resistance Training in Strategies to Reduce Injury Risk.
