

RESEARCH ARTICLE

Manual muscle testing and hand-held dynamometry in people with inflammatory myopathy: An intra- and interrater reliability and validity study

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Abbreviations: IM, inflammatory myopathy; DM, dermatomyositis; PM, polymyositis; MMT, manual muscle testing; MMT8, short version of the of the

Abstract

Manual muscle testing (MMT) and hand-held dynamometry (HHD) are commonly used in people with inflammatory myopathy (IM), but their clinimetric properties have not yet been sufficiently studied. To evaluate the reliability and validity of MMT and HHD, maximum isometric strength was measured in eight muscle groups across three measurement events. To evaluate reliability of HHD, intra-class correlation coefficients (ICC), the standard error of measurements (SEM) and smallest detectable changes (SDC) were calculated. To measure reliability of MMT linear Cohen's Kappa was computed for single muscle groups and ICC for total score. Additionally, correlations between MMT8 and HHD were evaluated with Spearman Correlation Coefficients. Fifty people with myositis (56±14 years, 76% female) were included in the study. Intra- and interrater reliability of HHD yielded excellent ICCs (0.75–0.97) for all muscle groups, except for interrater reliability of ankle extension (0.61). The corresponding SEMs% ranged from 8 to 28% and the SDCs% from 23 to 65%. MMT8 total score revealed excellent intra- and interrater reliability (ICC>0.9). Intrarater reliability of single muscle groups was substantial for shoulder and hip abduction, elbow and neck flexion, and hip extension (0.64–0.69); moderate for wrist (0.53) and knee extension (0.49) and fair for ankle extension (0.35). Interrater reliability was moderate for neck flexion (0.54) and hip abduction (0.44); fair for shoulder abduction, elbow flexion, wrist and ankle extension (0.20–0.33); and slight for knee extension (0.08). Correlations between the two tests were low for wrist, knee, ankle, and hip extension; moderate for elbow flexion, neck flexion and hip abduction; and good for shoulder abduction. In conclusion, the MMT8 total score is a reliable assessment to consider general muscle weakness in people with myositis but not for

Validity Reliability Manual Muscle Testing

**Marybeth Brown, Helen Hislop, Dale
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Validity and Reliability of Manual Muscle Testing Lam-Quynh Nguyen, 2005 **Guidelines for Chiropractic Quality Assurance and Practice Parameters** Scott Haldeman, David Chapman-Smith, Donald M. Petersen, 2005 The first ever practice guidelines by and for the profession These proceedings are the result of the landmark Mercy Center Consensus Conference in which chiropractic practitioners in the academic clinical political and regulatory sectors met to reach agreement on standards of practice producing guidelines for practice that provide a major step toward addressing the needs of the patient and assuring the quality and acceptance of chiropractic health services This publication represents the greatest consensus ever achieved by the profession and is a must have for every chiropractic student and practitioner

Musculoskeletal Assessment Hazel M. Clarkson, 2000 Completely revised and updated this edition presents the principles and methodology of assessing both joint range of motion ROM goniometry and manual muscle strength for the head neck trunk and extremities Each chapter is devoted to a separate anatomical region and provides knowledge of pertinent surface anatomy and deep anatomy Excellent photography and illustrations enhance comprehension of techniques and serve as a self learning tool New to this edition New vertical format second color added to line art 200 new photographs detailed coverage of ROM and muscle length assessment and measurement for each body region comprehensive coverage of end feels for each joint motion and chapter relating assessment methods to treatment techniques and activities of daily living A useful resource for assessment and treatment *Daniels and Worthingham's Muscle Testing - E-Book* Marybeth Brown, Helen Hislop, Dale Avers, 2013-01-25 A practical handbook on evaluating muscular strength and function Daniels and Worthingham's Muscle Testing Techniques of Manual Examination and Performance Testing 9th Edition makes it easy to understand and master procedures in manual muscle testing and performance testing Clear illustrated instructions provide a guide to patient positioning direction of motion and direction of resistance In addition to muscle testing of normal individuals and others with weakness or paralysis this edition includes new coverage of alternative strength tests and performance tests for older adults and others with functional decline such as the inactive and obese Written by educators Helen J Hislop Dale Avers and Marybeth Brown this classic physical therapy reference now features an Evolve companion website with video clips demonstrating key muscle testing techniques Drawings and arrows along with clear written directions make it easy to understand and perform muscle testing procedures allowing you to assess deficits in strength balance and range of motion More than 600 illustrations clearly show testing sequences muscle anatomy and muscle innervation Video clips of over 100 muscle tests on the Evolve companion website demonstrate the art and technique of muscle testing in a clinical setting Details of muscle anatomy and innervation help in linking muscle topography with function Helpful Hints and Substitutions boxes provide additional tips and highlight muscle substitutions that may occur during a test to ensure greater accuracy in testing A constant reference number clearly identifies each muscle in the body indexed in the Alphabetical List of Muscles by

Region as well as in the Ready Reference Anatomy Manual on Evolve to speed cross referencing and help you quickly identify any muscle NEW chapters on performance testing cover functional strength testing in older adults and those with functional decline and testing muscle performance in various clinical settings NEW chapters on manual muscle testing address when to use manual muscle testing the limitations of manual muscle testing and alternatives to manual muscle testing UPDATED references for each chapter include the most current evidence based information NEW An Evolve companion website helps you hone your manual testing skills with video clips of over 100 muscle tests and with the Ready Reference Anatomy Guide

Fundamentals of the Physical Therapy Examination: Patient Interview and Tests & Measures Stacie J. Fruth, 2025-01-24 Fundamentals of the Physical Therapy Examination Patient Interview and Tests Measures Third Edition provides physical therapy students and clinicians with the fundamental step by step information needed to determine questions to ask and tests and measures to perform during a patient exam **Muscle and Sensory Testing - E-Book** Nancy Berryman Reese, 2020-04-21 NEW Techniques of Functional Muscle Testing chapter includes completely revised content to give you a strong foundation of testing techniques UPDATED Expanded clinical notes and case vignettes challenge you to apply your knowledge to real world situations and think creatively about clinical problems UPDATED Consistent chapter layout by joint and muscle system allows you to easily locate important information UPDATED References throughout the book enable you to quickly find the most up to date sources on specific topics UNIQUE 185 Video clips on the companion Evolve website reinforce your understanding of key techniques such as muscle tests handheld dynamometry pediatric handheld dynamometry sensory and neurologic testing proper patient and clinician positioning and force application *Fundamentals of Tests and Measures for the Physical Therapist Assistant* Stacie J. Fruth, Carol Fawcett, 2019-02-26 Fundamentals of Tests and Measures for the Physical Therapist Assistant provides students with the tools required to interpret the physical therapy evaluation and replicate the measurements and tests This text guides students in learning how to utilize case information and documentation furnished by the PT to assist in the follow up treatment **Daniels and Worthingham's Muscle Testing - E-Book** Dale Avers, Donovan J. Lott, Marybeth Brown, 2024-02-06 Daniels and Worthingham's Muscle Testing 11th Edition offers the clear information needed to master procedures and enhance clinical decision making in manual muscle testing and performance testing Comprehensive discussion of the value of strength testing with clear illustrated instructions provide a detailed guide to patient positioning clinician instructions and application of skill In addition to updated muscle testing of normal individuals and others with weakness or paralysis this edition includes updated information on alternative strength and performance tests for all adult populations Updated comprehensive coverage for muscle dynamometry and ideal exercises enhances this text's relevance for today's clinician An eBook version included with print purchase provides access to all the text figures and references with the ability to search customize content make notes and highlights and have content read aloud Drawings and arrows along with clear written directions make it easy to understand and perform muscle testing

procedures to assess deficits in strength balance and range of motion More than 500 illustrations clearly show testing sequences muscle anatomy and muscle innervation Content on the muscle dynamometer and muscle dynamometry data introduces you to muscle dynamometry including muscle dynamometer methods and results with each muscle Ideal exercises for selected muscles thoroughly explain procedures based on the literature Chapter on functional performance testing covers functional strength testing in older adults and those with functional decline and testing muscle performance in various clinical settings Chapter on strength testing for active populations includes a variety of tests appropriate for many settings with reference data for comparison Chapters on manual muscle testing address how to enhance the reliability and validity of manual muscle testing and other practical considerations of manual muscle testing Details of muscle anatomy and innervation help in linking muscle topography with function Clinical Relevance and Substitutions boxes provide additional tips and highlight muscle substitutions that may occur during a test to ensure greater accuracy A constant reference number clearly identifies each muscle in the body indexed in the Alphabetical List of Muscles by Region as well as in the Ready Reference Anatomy chapter in the eBook included with print purchase to speed cross referencing and help you quickly identify any muscle Updated content throughout provides the most current information needed to be an effective practitioner Updated references ensure content is current and applicable for today s practice NEW eBook version included with print purchase provides access to all the text figures and references with the ability to search customize content make notes and highlights and have content read aloud Plus the eBook includes video clips and bonus Ready Reference Anatomy and Assessment of Muscles Innervated by Cranial Nerves content

Daniels and Worthingham's Muscle Testing, First South Asia Edition E Book Dale Avers, Marybeth Brown, 2018-11-13 Daniels and Worthingham s Muscle Testing First South Asia Edition E Book *Campbell's Physical Therapy for Children Expert Consult - E-Book* Robert Palisano, Margo Orlin, Joseph Schreiber, 2022-08-20 Selected for Doody s Core Titles 2024 with Essential Purchase designation in Physical Therapy Gain a solid foundation in physical therapy for infants children and adolescents Campbell s Physical Therapy for Children 6th Edition provides essential information on pediatric physical therapy practice management of children with musculoskeletal neurological and cardiopulmonary conditions and special practice settings Following the APTA s Guide to Physical Therapist Practice this text describes how to examine and evaluate children select evidence based interventions and measure outcomes to help children improve their body functions activities and participation What also sets this book apart is its emphasis on clinical reasoning decision making and family centered care Written by a team of PT experts led by Robert J Palisano this book is ideal for use by students and by clinicians in daily practice Comprehensive coverage provides a thorough understanding of foundational knowledge for pediatric physical therapy including social determinants of health development motor control and motor learning as well as physical therapy management of pediatric disorders including examination evaluation goal setting the plan of care and outcomes evaluation Focus on the elements of patient client

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Examination of the Shoulder Ryan J. Warth, Peter J. Millett, 2015-06-24 This text presents a comprehensive and concise evidence based and differential based approach to physical examination of the shoulder in a manner that promotes its successful application in clinical practice Additionally this book provides an integrated approach to the diagnosis of numerous shoulder pathologies by combining discussions of pathoanatomy and the interpretation of physical examination techniques and was written for any health care professional or student who may be required to evaluate patients who present with shoulder pain This information will allow the clinician to make informed decisions regarding further testing procedures imaging and potential therapeutic options Physical Examination of the Shoulder will serve as an invaluable resource for practicing orthopedic surgeons sports medicine specialists physical therapists residents in training and medical students interested in the field of clinical orthopedics **Fundamentals of Musculoskeletal Assessment Techniques** M. Lynn

Palmer, Marcia E. Epler, Marcia F. Epler, 1998 Organized by region this text provides the fundamentals of evaluation and examination techniques of the musculoskeletal system Each region begins with step by step instructions for goniometry manual muscle testing muscle length joint accessory motions and special orthopedic tests Special discussions of posture and gait analysis are also included New in this edition is a chapter on Assessment of Pain The discussion on the Spine has been expanded to three chapters Cervical Thoracolumbar Spine and Sacroiliac Joint Compatibility BlackBerry OS 4.1 or Higher iPhone iPod Touch 2.0 or Higher Palm OS 3.5 or higher Palm Pre Classic Symbian S60 3rd edition Nokia Windows Mobile Pocket PC all versions Windows Mobile Smartphone Windows 98SE 2000 ME XP Vista Tablet PC **Kinesiology for**

Occupational Therapy Melinda F. Rybski, 2024-06-01 Kinesiology for Occupational Therapy Third Edition covers the theoretical background for understanding the kinematics and kinetics of normal human physiological movement Each specific joint is assessed in terms of musculoskeletal function movements possible and an overview of pathology that may develop Dr Melinda Rybski covers four occupational therapy theories related to functional motion that are important for occupational therapists to know This Third Edition has been updated to reflect the current field and includes new information

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Orthopedic Clinical Examination Reiman, Michael, 2015-12-18
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Oxford Textbook of Rheumatology Richard Watts, Richard A Watts, Philip Conaghan, Chris Denton, Helen Foster, John Isaacs, Ulf Müller-Ladner, 2013-10 A strong clinical emphasis is present throughout this volume from the first section of commonly presenting problems through to the section addressing problems shared with a range of other clinical sub specialties

Energetic Kinesiology Tania McGowan, Charles Krebs, 2013-12-01 Energetic Kinesiology is an emerging field internationally in the Complementary Health Sciences gaining more and more scientific support and recognition This fully referenced textbook describes the field and explains the techniques upon which it is built It covers the underlying principles the methods and scientific support for the efficacy of Energetic Kinesiology It also offers a unique history of Energetic Kinesiology based on the first hand experience of Charles Krebs who knew most of the originators of Energetic Kinesiology techniques personally The book is a unique well illustrated single source of a vast array of information research and clinical knowledge in a format that is both accessible and practical to clinicians and students

Oxford Textbook of Rheumatology Richard A. Watts, Philip G. Conaghan, Christopher Denton, Helen Foster, John Isaacs, Ulf Müller-Ladner, 2013-10-31 The field of rheumatology has undergone numerous exciting advances in recent years especially the development of biological drugs with novel targets made possible by rapid advances in the basic science of musculoskeletal diseases together with improved imaging techniques This thoroughly revised fourth edition of the Oxford Textbook of Rheumatology reflects the changing face of the specialty and the many recent advances in the science treatment and understanding of rheumatic diseases The focus of this comprehensive reference work is the presentation and management of rheumatic conditions at all ages Where relevant treatment approaches are evidence based and cross referenced to national and international guidelines Each clinical chapter provides up to date treatment advice illustrated with clinical vignettes as appropriate and the authors consistently emphasize the

overlap of rheumatology with other disciplines With full colour illustrations throughout and a complementary online version the Oxford Textbook of Rheumatology Fourth Edition is an essential reference for all trainees and specialists in the field

RESEARCH METHODOLOGY IN HOSPITAL MANAGEMENT Dr.R.Emmanuel, **The Evidence-Based Practitioner** Catana Brown,2016-11-25 What is the evidence Why do you need it How do you evaluate it How do you use it to make decisions Put the evidence to work for your patients Become an effective evidence based practitioner Master the knowledge and clinical decision making skills you need to provide the very best care for your clients based on the evidence Step by step you ll learn how to find read understand critique and apply research evidence in practice *Orthopedic Physical Assessment - E-Book* David J. Magee,Robert C. Manske,2020-12-11 Selected for Doody s Core Titles 2024 with Essential Purchase designation in Sports Medicine Build your skills in the assessment of musculoskeletal pathology Orthopedic Physical Assessment 7th Edition covers the principles of assessment for all of the body s structures and joints including topics such as gait posture the head and face amputees primary care and sports emergencies The 7th edition offers additional functional assessment forms e tools updated evidence based reliability and validity tables and hundreds of video clips included with print purchase demonstrating special tests on how to perform musculoskeletal assessment Written by noted PT educators David J Magee and Robert C Manske this reference uses a systematic evidence based approach to prepare you for success in clinicals board exams and in rehabilitation practice Over 2 500 full color illustrations and photographs depict key concepts along with assessment techniques and special tests At a glance icons show the clinical utility of special tests supplemented by updated evidence based reliability and validity tables for tests and techniques Quick reference data includes hundreds of summary boxes red flag and yellow flag boxes differential diagnosis tables muscle and nerve tables and classification normal values and grading tables A Summary Pr cis of Assessment in each chapter serves as a review of assessment steps Combined with other books in the Musculoskeletal Rehabilitation series Scientific Foundations and Principles of Practice Pathology and Intervention and Athletic and Sports Issues this book provides you with the knowledge and background necessary to assess and treat musculoskeletal conditions NEW Updated information in all chapters includes new special tests as well as photos line drawings boxes tables and references NEW Head and Face chapter features updated information on concussion management NEW Enhanced Diagnostic Ultrasound Imaging section added to applicable chapters along with new photos and diagnostic images NEW Updated psychometric tables for special tests list reliability sensitivity specificity and and likelihood ratios when available NEW More case studies present real life scenarios to help you develop assessment and diagnostic skills using information from the chapter NEW Additional functional assessment forms e tools have been incorporated NEW Video clips included with print purchase demonstrate special tests to give you a clearer understanding of how to perform musculoskeletal assessment NEW Enhanced ebook version included with print purchase provides access to all of the text figures and references from the book on a variety of devices

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