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CHAPTER 8: REFERENCES

Aagaard, P.; Simonsen, E.B.; Magnusson, P.S.; Larsson, B. & Dyhre-Poulsen, P. (1998). A new concept for isokinetic hamstring:quadriceps muscle strength ratios. **American Journal of Sports Medicine, 26(2): 231-237.**

Abe, T.; Kawakami, Y.; Ikegawa, S.; Kanehisa, H. & Fukunaga, T. (1992). Isometric and isokinetic knee joint performance in Japanese alpine ski racers. **Journal of Sports Medicine and Physical Fitness, 31: 353-357.**

Abermethyl, P.; Wilson, G. & Logan, P.A. (1995). Strength and power assessment: Issues, controversies and challenges. **Sports Medicine, 19: 401-417.**

Abermethyl, P. & Wilson, G. (2000). Introduction to the assessment of strength and power. In: **Australian Sports Commission: Physiological tests for elite athletes.** Champaign, IL: Human Kinetics.

Agre, J.C. & Baxter, T.L. (1987). Musculoskeletal profile of male collegiate soccer players. **Archives of Physical Medicine and Rehabilitation, 68: 147-150.**

Normative isokinetic torque values for rehabilitation in South Africa

Alexander, J. & Molnar, G.E. (1973). Muscular strength in children. Preliminary report on objective standards. **Archives of Physical Medicine and Rehabilitation, 54: 424-427.**

Alexander, M.J.L. (1990). Peak torque values for antagonist muscle groups and concentric and eccentric contraction types of elite sprinters. **Archives of Physical Medicine and Rehabilitation, 71: 334-339.**

American College of Sports Medicine. (1991). **Guidelines for exercise testing and prescription.** Lea & Febiger, Philadelphia.

American College of Sports Medicine. (1995). **Guidelines for exercise testing and prescription.** Baltimore: Williams & Wilkins.

Anderson, M.A.; Gieck, J.H.; Perrin, D.; Weltman, A.; Ruth, R. & Denegar, C. (1991). The relationship among isometric, isotonic, and isokinetic concentric and eccentric quadriceps and hamstrings force and three components of athletic performance. **Journal of Orthopaedic and Sports Physical Therapy, 14: 114-120.**

Anderson, M.K.; Hall, S.J.; & Martin, M. (2000). **Sports Injury Management.** (2nd ed.) Philadelphia, Pennsylvania: Lippincott Williams and Wilkins.

Normative isokinetic torque values for rehabilitation in South Africa

- Baker, D., Wilson, G. & Caryon, B. (1994). Gender specific strength and power. *Journal of Orthopaedic and Sports Physical Therapy*, 19(5), 298-292.
- Appen, L. & Duncan, P.W. (1986). Strength relationship of the knee musculature: Effects of gravity and sport. *Journal of Orthopaedic and Sports Physical Therapy*, 7: 232-235.
- Borgue, F., Demidot, P., Nordin, M., Pentaropoulos, M. & Yessing, P. (2001). Aiki, P. & Davies, G.J. (1985). Rest interval between isokinetic velocity spectrum rehabilitation sets. *Physical Therapy*, 65(abstract): 733-734.
- Armstrong, E.L. (1984). Mechanisms of exercise induced delayed onset of muscle soreness: a brief review. *Medicine and Science in Sports and Exercise*, 16: 529-538.
- Batzoglou, V., Wilens, J.G. & Brode, D.A. (1997). *Strength and Conditioning for Athletes*. Champaign, IL: Human Kinetics.
- Arnheim, D.D. & Prentice, W.E. (1993). *Principles of Athletic Training*. (8th ed.). St. Louis, MI: Mosby Year Book.
- Ashley, C.D. & Weiss, L.W. (1994). Vertical jump performance and selected physiological characteristics of women. *Journal of Strength and Conditioning Research*, 8: 5-11.
- Asmussen, E. (1973). Growth in muscular strength and power. In: Rarick, G.L. (ed.). *Human growth and development*. New York: Academic Press.

Normative isokinetic torque values for rehabilitation in South Africa

Baker, D.; Wilson, G. & Carlyon, B. (1994). Generality versus specificity: A comparison of dynamic and isometric measurements of strength and speed-strength. **European Journal of Applied Physiology, 68: 350-355.**

Balague, F.; Damidot, P.; Nordin, M.; Pamianpour, M. & Waldburg, M. (1993). Cross-sectional study of the isokinetic muscle trunk strength among school children. **Spine, 18: 1199-1205.**

Parsons, M.G.; Mansory, B.H.; Bullock, R.A. & McKeown, P. (1992). *Physical Therapy*

Baltzopoulos, V. & Brodie, D.A. (1989). Isokinetic dynamometry: applications and limitations. **Sports Medicine, 8(2): 101–116.**

Baltzopoulos, V.; Williams, J.G. & Brodie, D.A. (1991). Sources of error in isokinetic dynamometry. **Journal of Orthopaedic and Sports Physical Therapy, 13: 138-141.**

Bandy, W.D. & Timm, K.E. (1992). Relationship between peak torque, work, and power for knee flexion and extension in clients with grade I medial compartment sprains of the knee. **Journal of Orthopaedic and Sports Physical Therapy, 16(6): 288-292.**

Warrat, J.E.; Wood, A.M. & Williams, M.V. (1979). Speed of behaviour as a function of age changes and the integrity of the nervous system. In: *Psychology of Aging*, P. (ed.), Brain functioning in old age. New York: Springer-Verlag.

Normative isokinetic torque values for rehabilitation in South Africa

Barber, S.D.; Noyes, F.R.; & Mangine, R.E. (1990). Quantitative assessment of functional limitations in normal and anterior cruciate ligament-deficient knees. **Clinical Orthopaedics, 255: 204-214.**

Barnes, W.S. (1981). Isokinetic fatigue curves at different contractile velocities. **Archives of Physical Medicine and Rehabilitation, 62: 66-69.**

Bemben, M.G.; Massey, B.H.; Boileau, R.A. & Misner, J.E. (1992). Reliability of isometric force-time curve parameters for men aged 20 to 79 years. **Journal of Applied Sports Science Research, 6(3): 158-164.**

Berg, K.; Blanke, D. & Miller, M. (1985). Muscular fitness profile of female college basketball players. **Journal of Orthopaedic and Sports Physical Therapy, 7: 59-64.**

Borges, G. (1988). Isometric and isokinetic knee extension and flexion torque in

Berg, J.E.; Miller, M & Stephens, L. (1986). Determinants of 30-meter sprint times in pubescent males. **Journal of Sports Medicine and Physical Fitness, 26: 225-231.**

Boaco, C.; Mogkovi, P. & Luhtanen, P. (1983). Relationship between isokinetic

Birren, J.E.; Woods, A.M. & Williams, M.V. (1979). Speed of behaviour as an indicator of age changes and the integrity of the nervous system. In: Hoffmeister, F. & Miller, F. (ed.). **Brain functioning in old age.** New York: Springer-Verlag.

Normative isokinetic torque values for rehabilitation in South Africa

Blazevich, A.J. & Jenkins, D.G. (1998). Predicting sprint running times from isokinetic and squat lift tests: A regression analysis. **Journal of Strength and Conditioning Research, 12(2): 101-103.**

Bloomfield, J.; Fricker, P.A. & Fitch K.D. (1995). **Science and medicine in sport.** (2nd ed.) Blackwell Science: Singapore.

Bohannon, R.W.; Gajdosik, R.L. & LeVeau, B.F. (1986). Isokinetic knee flexion and extension torque in the upright sitting and semireclined sitting positions. **Physical Therapy, 66(7): 1083-1086.**

Boltz, S. & Davies, G.J. (1984). Leg length differences and correlation with total leg strength. **Journal of Orthopaedic and Sports Physical Therapy, 6: 123-129.**

Borges, O. (1989). Isometric and isokinetic knee extension and flexion torque in men and women aged 20-70. **Scandinavian Journal of Rehabilitation Medicine, 21: 45-53.**

Bosco, C.; Mogroni, P. & Luhtanen, P. (1983). Relationship between isokinetic performance and ballistic movement. **European Journal of Applied Physiology, 51: 357-364.**

Normative isokinetic torque values for rehabilitation in South Africa

Botha, M. (1997). **Isokinetiese versus isotoniese rehabilitasie na anterior kruisligament chirurgie.** Unpublished Master's dissertation, Pretoria University, RSA.

Braatz, J.H. & Gogia, P.P. (1987). The mechanics of pitching. **Journal of Orthopaedics and Sports Physical Therapy, 9: 56-69.**

Brown, L.P.; Niehues, S.L. & Harrah, A. (1988). Upper extremity range of motion and isokinetic strength of the internal and external rotators in major league baseball players. **American Journal of Sports Medicine, 16: 577-585.**

Brown, L.E.; Whitehurst, M.; Bryant, J.R. & Buchalter, D.N. (1993). Reliability of the Biodex system 2 isokinetic dynamometer concentric mode. **Isokinetics and Exercise Science, 3(3): 160-163.**

Brown, L.E.; Whitehurst, M.; Gilbert, R. & Buchalter, D.N. (1995). The effect of velocity and gender on load range during knee flexion and extension exercise on an isokinetic device. **Journal of Orthopaedic and Sports Physical Therapy, 21(2): 107-112.**

Brown, L.E. (ed.) (2000). **Isokinetics in human performance.** Champagne, Illinois: Human Kinetics.

Normative isokinetic torque values for rehabilitation in South Africa

- Canalan, T.D.; Johnson, M.E. & Chao, E.Y.S. (1991). Shoulder strength analysis.
- Brown, L.E. & Whitehurst, M. (2000). In: Brown, L.E. (ed.) (2000). **Isokinetics in human performance**. Champaign, IL: Human Kinetics.
- Brukner, P. & Khan, K. (2001). **Clinical Sports Medicine**. Sydney, Australia: McGraw-Hill Book Company.
- Burdett, R.G. & VanSwearingen, J. (1987). Reliability of isokinetic muscle endurance tests. **Journal of Orthopaedic and Sports Physical Therapy, 8: 484-488**.
- Burkett, L.N. (1970). Causitive factors in hamstrings strains. **Medicine and Science in Sports and Exercise 2(1): 39-42**.
- Burnett, C.N.; Betts, E.F. & King, W.M. (1990). Reliability of isokinetic measurements of hip muscle torque in young boys. **Physical Therapy, 70: 244-249**.
- Burnie, J. & Brodie, D.A. (1986). Isokinetics in the assessment of rehabilitation. **Clinical Biomechanics, 1: 140-146**.

Normative isokinetic torque values for rehabilitation in South Africa

Cahalan, T.D.; Johnson, M.E. & Chao, E.Y.S. (1991). Shoulder strength analysis using the Cybex II isokinetic Dynamometer. **Clinical Orthopaedics and Related Research**, 271(October): 249-257.

Capranica, L.; Cama, G.; Fanton, F.; Tessitore, A. & Figura, F. (1992). Force and power of preferred and nonpreferred leg in young soccer players. **Journal of Sports Medicine and Physical Fitness**, 32(4): 358-363.

Carter, J.E.L. (1982). **Body Composition of Olympic Athletes**. In J.E.L. Carter (ed.). Physical Stature of Olympic Athletes. Part 1, Montreal Olympic Games Anthropological Project. Basel: Karger.

Chan, K.M. & Maffulli, N., ed. (1996). **Principles and practice of isokinetics in sports medicine and rehabilitation**. Williams & Wilkins, Baltimore.

Charteris, J. & Goslin, B.R. (1986). Draaimoment-, werk- en plofkragmoontlikhede van die elmboog by jong, normale volwassenes: Kliniese implikasies en toepassings. **S.A. Tydskrif vir Navorsing in Sport, Liggaamlike Opvoedkunde en Ontspanning**, 9(1): 39 - 49.

Normative isokinetic torque values for rehabilitation in South Africa

Chin, M.; Raymond, R.C.H.; Yuan, Y.W.Y.; Li, R.C.T. & Wong, A.S.K. (1994). Cardiorespiratory fitness and isokinetic muscle strength of elite Asian junior soccer players. **Journal of Sports Medicine and Physical Fitness, 34: 250-57.**

Ciccone, C.D. & Lions, C.M. (1987). Relationship of upper extremity strength and swimming stroke technique on competitive freestyle swimming performance. **Journal of Human movement Studies, 13: 143-150.**

Clarkson, P.M.; Kroll, W. & Melchionda, A.M. (1981). Age, isometric strength, rate of tension development, and fiber composition. **Journal of Gerontology, 36: 648-653.**

Cohen, D.B.; Mont, M.A.; Campbeel, K.R.; Vogelstein, B.N. & loewy, J.W. (1994). Upper extremity physical factors affecting tennis serve velocity. **American Journal of Sports Medicine, 22(6): 746-750.**

Colliander, E. & Tesch, P. (1989). Bilateral eccentric and concentric torque of quadriceps and hamstrings muscles in females and males. **European Journal of Applied Physiology, 59: 227-232.**

Davies, G.J. (1995). The need for critical thinking in rehabilitation. **Journal of Sports Rehabilitation, 4: 1-22.**

Normative isokinetic torque values for rehabilitation in South Africa

Connelly Maddux, R.E.; Kibler, W.B. & Uhl, T. (1989). Isokinetic peak torque and work values for the shoulder. **Journal of Orthopaedic and Sports Physical Therapy, 11: 264-269.**

Constain, R. & Williams, J.G. (1984). Isokinetic quadriceps and hamstrings torque levels of adolescent, female soccer players. **Journal of Orthopaedic and Sports Physical Therapy, 5: 196-200.**

Cote, C.; Simoneau, J.; Lagasse, P.; Boulay, M.; Thibault, M.; Marcotte, M. & Bouchard, C. (1988). Isokinetic strength training protocols: Do they induce skeletal muscle fiber hypertrophy? **Archives of Physical Medicine and Rehabilitation, 69: 281-285.**

Davies, G.J. (1992). **A compendium of isokinetics in clinical usage.** (4th ed.). LaCrosse, WI: S & S Publishers.

Davies, G.J. & Dickoff-Hoffman, S.D. (1993). Neuromuscular testing and rehabilitation of the shoulder complex. **Journal of Orthopaedic and Sports Physical Therapy, 18: 449-458.**

Davies, G.J. (1995). The need for critical thinking in rehabilitation. **Journal of Sports Rehabilitation, 4: 1-22.**

Normative isokinetic torque values for rehabilitation in South Africa

- Dillman, C.J. (1991). The upper extremity in tennis and throwing athletes.
- Davies, G.J.; Heiderscheit, B.C. & Clark, M. (1995). Open kinetic chain assessment and rehabilitation. **Athletic Training: Sports and Health Care Perspective, 1: 347-370.**
- Docherty, D. & Gatt, C.A. (1991). Relationship of physical size, physique, and
- Davies, G.J.; Wilk, K. & Ellenbecker, T.S. (1997). **Assessment of strength.** In: Orthopaedics and Sports Physical Therapy, 3rd ed. Ed. Malone, T.R.; McPoil, T. & Nitz, A.J. St. Louis: Mosby.
- Donatelli, R.; Dall'Amico, B.; Baroni, G.S.; Davila, G.; & Sesto, S.M. (1991).
- Davies, G.L. & Zillner, D.A. (1999). Functional progression of exercise during rehabilitation. In: **Knee ligament rehabilitation**, Ellenbecker, T. S. (ed.). New York: Churchill Livingstone.
- Deans, P.C. (1967). Cardiovascular responses to isometric and dynamic
- Davies, G.L.; Heiderscheit, Brinks, K. (2000). In **Isokinetics in human performance.** Ed. Brown, L.E. Champaign, IL: Human Kinetics.
- Dvir, Z.; Eger, G.; Halperin, N. & Shinar, A. (1999). High intensity activity and
- DeNuccio, D.; Davies, G.J. & Rowinski, M. (1991). Comparison of quadriceps isokinetic eccentric and isokinetic concentric data using a standard fatigue protocol. **Isokinetic Exercise and Science, 1: 81-86.**
- patellofemoral pain syndrome. Part I: pain provocation during concentric and eccentric isokinetic activity. **Isokinetics and Exercise Science, 1: 28-30.**

Normative isokinetic torque values for rehabilitation in South Africa

- Dillman, C.J. (1991). **The upper extremity in tennis and throwing athletes.** Paper presented at the United States Tennis Association National Meeting, Tuscon, AZ.
- Docherty, D. & Gaul, C.A. (1991). Relationship of physical size, physique, and composition to physical performance in young boys and girls. **International Journal of Sports Medicine, 12: 525-532.**
- Donatelli, R.; Catlin, P.A.; Backer, G.S.; Drane, D.L. & Slater, S.M. (1991). Isokinetic hip abductor to adductor torque ratio in normal individuals. **Isokinetics and Exercise Science, 1: 103–111.**
- Douris, P.C. (1991). Cardiovascular responses to velocity-specific isokinetic exercise. **Journal of Orthopaedic and Sports Physical Therapy, 13(1): 28-32.**
- Dvir, Z.; Eger, G.; Halperin, N. & Shklar, A. (1989). Thigh muscles activity and anterior cruciate ligament insufficiency. **Clinical Biomechanics, 4: 87-91.**
- Dvir, Z.; Halperin, N.; Shklar, A & Robinson, D. (1991). Quadriceps function and patellofemoral pain syndrome. Part I: pain provocation during concentric and eccentric isokinetic activity. **Isokinetics and Exercise Science, 1: 26-30.**

Normative isokinetic torque values for rehabilitation in South Africa

Dvir, Z. (1995). **Isokinetics: muscle testing, interpretation and clinical applications.** New York: Churchill Livingstone.

Elert, J. & Gerdle, B. (1989). The relationship between contraction and relaxation during fatiguing isokinetic shoulder flexions. An electromyographic study. **European Journal of Applied Physiology, 59: 303-309.**

Ellenbecker, T.S.; Davies, G. & Rowinski, M. (1988). Concentric versus eccentric isokinetic strengthening of the rotator cuff. **American Journal of Sports Medicine, 16(1): 64–69.**

Ellenbecker, T.S. (1991). A total arm strength isokinetic profile of highly skilled tennis players. **Isokinetics and Exercise Science, 1: 9-21.**

Ellenbecker, T.S. (1992). Shoulder internal and external rotation strength and range of motion of highly skilled junior tennis players. **Isokinetics and Exercise Science, 2(2): 65-72.**

Ellenbecker, T.S. (1995). Rehabilitation of shoulder and elbow injuries in tennis players. **Clinics in Sports Medicine, 14(1): 87-110.**

Normative isokinetic torque values for rehabilitation in South Africa

Ellenbecker, T.S. & Roetert, E.P. (1995). Concentric isokinetic quadriceps and hamstrings strength in elite junior tennis players. **Isokinetics and Exercise Science, 5: 3-6.**

Ellenbecker, T.S. (1998). Personal communication. Physiotherapy Associates, Scottsdale Sports Clinic, Arizona.

Falkel, J.L. (1978). Plantar flexor strength testing using the Cybex isokinetic dynamometer. **Physical Therapy, 58: 847-850.**

Farrel, M. & Richards, J.E. (1986). Analysis of the reliability and validity of the kinetic communicator exercise device. **Medicine and Science in Sports and Exercise, 18: 44-49.**

Feiring, D.C. & Ellenbecker, T.S. (1996). Single versus multiple joint isokinetic testing with ACL reconstructed patients. **Isokinetics and Exercise Science, 6: 109-115.**

Felder, C.R. (1978). Effect of hip position on quadriceps and hamstrings force. **Medicine and Science in Sports and Exercise, 10 (Abstract): 64.**

Fig-Hoyer, A.R.; Gustafsson, L. & Bostedt, Y. (1980). Isokinetic and work capacity characteristics. **European Journal of Applied Physiology, 40: 221-234.**

Normative isokinetic torque values for rehabilitation in South Africa

Figoni, S.F. & Morris, A.F. (1984). Effects of knowledge of results on reciprocal, isokinetic strength and fatigue. **Journal of Orthopaedic and Sports Physical Therapy, 6: 190-197.**

Fillyaw, M.; Bevins, T. & Fernandez, L. (1986). Importance of correcting isokinetic peak torque for the effect of gravity when calculating knee flexor to extensor muscle ratios. **Physical Therapy, 66: 23 – 29.**

Freedson, P.S.; Gilliam, T.B.; Mahoney, T.; Maliszewski, A.F. & Kastango, K. (1993). Industrial torque levels by age group and gender. **Isokinetics and Exercise Science, 3: 34-42.**

Fry, R.W. & Morton, A.R. (1991). Physiological and kinanthropometric attributes of elite flatwater kayakers. **Medicine and Science in Sports and Exercise, 23(11): 1297-1301.**

Fry, A.C., Kraemer, W.J. & Weseman, C.A. (1991). Effects of an off-season strength and conditioning programme on starters and non-starters in women's collegiate volleyball. **Journal of Applied Sports Science Research, 5: 174-181.**

Fugl-Meyer, A.R.; Gustafsson, L. & Bustedt, Y. (1980). Isokinetic and static plantar flexion characteristics. **European Journal of Applied Physiology, 45: 221-234.**

Normative isokinetic torque values for rehabilitation in South Africa

Ghezi, D.R.; Niven, A.L.; Thomas, M. & Mayhew, J. (1981). Torque characteristics

Fugl-Meyer, A.R. (1981). Maximum isokinetic ankle plantar and dorsal flexion torques in trained subjects. **European Journal of Applied Physiology, 47: 393-404.**

Gillen, T.B.; Sady, S.P.; Freeman, P.S. & Villaneda, J. (1979). Isokinetic torque

Fugl-Meyer, A.R.; Gerdle, B.; Eriksson, B.-E. & Jonsson, B. (1985). Isokinetic plantar flexion endurance. **Scandinavian Journal of Rehabilitation Medicine, 17: 47-52.**

Glen, G.W.; Nicolas, J.A. & Ward, J.N. (1976). Isokinetic contraction following

Ferguson, J.P.; Blackley, M.W.; Knight, R.D.; Sutcliffe, T.G.; Underwood, F.B. & Greathouse, D.G. (1989). Effects of varying electrode site placements on the torque output of an electrically stimulated involuntary quadriceps femoris muscle contraction. **Journal of Orthopaedic and Sports Physical Therapy, July: 24-29.**

Rehabilitation Medicine, 11: 106-109

Garrick, J.G. & Webb, D.R. (1999). **Sports injuries: diagnosis and management.** 2nd ed. Philadelphia, Pennsylvania: W.B. Saunders Company.

antagonist conditioning and contraction. **Journal of Applied Physiology, 77(2):**

Gerdle, B.; Elert, J. & Hendrikssen-Larsen, K. (1989). Muscular fatigue during repeated isokinetic shoulder forward flexions in young females. **European Journal of Applied Physiology, 59: 666-673.**

relationship. **Sports Medicine, 3: 61-64.**

Normative isokinetic torque values for rehabilitation in South Africa

Ghena, D.R.; Kurth, A.L.; Thomas, M. & Mayhew, J. (1991). Torque characteristics of the quadriceps and hamstrings muscles during concentric and eccentric loading. **Journal of Orthopaedic and Sports Physical Therapy 14(4): 149-154.**

Gray, R.K., Star, K.B. & Walsh, A. (1982). Relationship between leg speed and
Gilliam, T.B.; Sady, S.P.; Freedson, P.S. & Villanacci, J. (1979). Isokinetic torque levels for high school football players. **Archives of Physical Medicine and Rehabilitation 60: 110-114.**

M.V. (1975). Relationship of knee extensor strength and hopping test performance in the elderly.
Gleim, G.W.; Nicholas, J.A. & Webb, J.N. (1978). Isokinetic evaluation following leg injuries. **Physician and Sports Medicine 6(1): 74-82.**

Griffin, J.W. (1977). Differences in isokinetic torque between the sexes.
Goslin, B.R. & Charteris, J. (1979). Isokinetic dynamometry: Normative data for clinical use in lower extremity (knee) cases. **Scandinavian Journal of Rehabilitation Medicine, 11: 105-109.**

function and training after total hip joint surgery.
Grabiner, M.D. (1994). Maximum rate of force development is increased by antagonist conditioning and contraction. **Journal of Applied Physiology, 77(2): 807-811.**

McGran, P.; Demilo, N. & Hummel, G. (1980). Relationships between multiple predictor variables and normal knee joint position.
Grace, T. (1985). Muscle imbalance and extremity injury: A perplexing relationship. **Sports Medicine, 3: 61-64.**

Normative isokinetic torque values for rehabilitation in South Africa

Graves, J.E.; Pollock, M.L. & Carol, J.F. (1994). Exercise, age, and skeletal muscle function. **Southern Medical Journal, 87(Suppl.): 18-22.**

Gray, R.K.; Start, K.B. & Walsh, A. (1962). Relationship between leg speed and leg power. **Research Quarterly 33(3): 395-399.**

Greenberger, H.B. & Paterno, M.V. (1995). Relationship of knee extensor strength and hopping test performance in the assessment of lower extremity function. **Journal of Orthopaedic and Sports Physical Therapy, 22: 202-206.**

Griffen, J.W. (1987). Differences in elbow flexion torque measured concentrically, eccentrically, and isometrically. **Physical Therapy, 67: 1205–1209.**

Grimby, G.; Gustafsson, E.; Peterson, L. & Renstrom, P. (1980). Quadriceps function and training after knee ligament surgery. **Medicine and Science in Sports and Exercise, 12(1): 70–75.**

Gross, M.T.; McGrain, P.; Demilio, N. & Humpal, S.A. (1989). Relationship between multiple predictor variables and normal knee torque production. **Physical Therapy, 11(2): 64-69.**

Normative isokinetic torque values for rehabilitation in South Africa

Gross, M.T. & Brugnotti, J.C. (1992). Relationship between multiple predictor variables and normal Biodex eversion-inversion peak torque and angular work. **Journal of Orthopaedic and Sports Physical Therapy, 15(1): 24-31.**

Hageman, P.A.; Gillaspie, D.M. & Hill, L.D. (1988). Effects of speed and limb dominance on eccentric and concentric isokinetic testing of the knee. **Journal of Orthopaedic and Sports Physical Therapy, 10: 59–65.**

Hageman, P.A.; Mason, D.K.; Rydlund, K.W. & Humpal, S.A. (1989). Effects of position and speed on eccentric and concentric isokinetic testing of the shoulder rotators. **Journal of Orthopaedic and Sports Physical Therapy, 11: 64-69.**

Hakkinen, K.; Komi, P.V. & Kauhanen, H. (1986). Electromyographic and force production characteristics of leg extensor muscles of elite weightlifters during isometric, concentric and various stretch-shortening cycle exercises. **International Journal of Sports Medicine, 7: 144-151.**

Hald, R.J. & Bottjen, E.J. (1987). Effect of visual feedback on maximal and submaximal isokinetic test measurements of normal quadriceps and hamstrings. **Journal of Orthopaedic and Sports Physical Therapy, 9: 86-93.**

Normative isokinetic torque values for rehabilitation in South Africa

Hall, P.S. & Roofner, M.A. (1991). Velocity spectrum study of knee flexion and extension in normal adults: 60 to 500 deg/sec. **Isokinetics and Exercise Science, 1(3): 131-137.**

Hanten, W.P. & Ramberg, C.L. (1988). Effect of stabilization on maximal isokinetic torque of the quadriceps femoris muscle during concentric and eccentric contractions. **Physical Therapy, 68(2): 219-222.**

Harries, U.J. & Bassey, E.J. (1990). Torque-velocity relationships for the knee extensors in women in their 3rd and 7th decades. **European Journal of Applied Physiology, 60: 187-190.**

Hart, D.L.; Stobbe, T.J. & Till, C.W. (1984). Effect of trunk stabilization on quadriceps femoris muscle torque. **Physical Therapy, 64: 1375-1380.**

Henderson, R.C.; Howes, C.L.; Erikson, K.L.; Heese, L.M. & DeMasi, R.A. (1993). Knee flexor-extensor strength in children. **Journal of Orthopaedic and Sports Physical Therapy, 18: 559-563.**

Herzog, W. (1988). The relation between the resultant moments at a joint and the moments measured by an isokinetic dynamometer. **Journal of Biomechanics, 21: 5-12.**

Normative isokinetic torque values for rehabilitation in South Africa

Heyward, V.H. (1997). **Advanced fitness assessment and exercise prescription.** (3rd ed.) Champaign, Illinois: Human Kinetics.

Highgenboten, C.L.; Jackson, A.W. & Meske, N.B. (1988). Concentric and eccentric torque comparisons for knee extension and flexion in young adult males and females using the Kinetic Communicator. **American Journal of Sports Medicine, 16: 234 – 237.**

Hinson, M.N.; Smith, W.C. & Funk, S. (1979). Isokinetics, A clarification. **Research Quarterly, 50: 30-35.**

Hislop, H. & Perrine, J.J. (1967). Isokinetic concept of exercise. **Physical Therapy, 7: 114–117.**

Hoke, B.; Howell, D. & Stack, M. (1983). The relationship between isokinetic testing and dynamic patellofemoral compression. **Journal of Orthopaedic and Sports Physical Therapy, 4: 150-153.**

Holmes, J.R. & Alderink, G.J. (1984). Isokinetic strength characteristics of the quadriceps femoris and the hamstrings muscles in high school students. **Physical Therapy, 64(6): 914-918.**

Normative isokinetic torque values for rehabilitation in South Africa

- Hopp, J.F. (1993). Effects of age and resistance training on skeletal muscle. **Physical Therapy, 73: 361-373.**
- Houglum, P.A. (2001). **Therapeutic exercise for athletic injuries.** Champaign, Illinois: Human Kinetics.
- Housh, T.J.; Thorland, W.G.; Tharp, G.D.; Johnson, G.O. & Cisar, C.J. (1984). Isokinetic leg flexion and extension of elite adolescent female track and field athletes. **Research Quarterly for Exercise and Sport 55(4): 347-350.**
- Housh, T.J.; Johnson, G.O.; Hughes, R.A.; Housh, D.J.; Hughes, R.J.; Fry, A.S.; Kenney, K.B. & Cisar, C.J. (1989). Isokinetic strength and bodycomposition of high school wrestlers across age. **Medicine and Science in Sports and Exercise, 21: 105-109.**
- Huston, L.M. & Wojtys, E.M. (1996). Neuromuscular performance in elite women athletes. **American Journal of Sports Medicine, 24: 427-436.**
- Hutton, R.S. (1992). Neuromuscular basis of stretching exercises. In: Komi, P.V. (ed.). **The Encyclopedia of Sports Medicine: Strength and Power in Sport.** London: Blackwell Scientific.

Normative isokinetic torque values for rehabilitation in South Africa

Israel, S. (1992). Age-related changes in strength and special groups. In: **Strength and power in sport**. Komi, P.V. (ed.). Oxford: Blackwell Scientific.

Ivey, F.M.; Calhoun, J.H.; Rusche, K. & Bierschenk, J. (1985). Isokinetic testing of shoulder strength: Normal values. **Archives of Physical Medicine and Rehabilitation** 66(June): 384-386.

Johnson, J. & Siegel, D. (1978). Reliability of an isokinetic movement of the knee extensors. **Research Quarterly**, 49: 88-90.

Johnson, T. (1982). Age-related differences in isometric and dynamic strength and endurance. **Physical Therapy**, 62: 985-989.

Jones, D.; Newham, Round, J. & Tolfree, S. (1986). Experimental human muscle damage. **Journal of Physiology**, 375: 435-448.

Kanehisa, H.; Ikegawa, S.; Tsunoda, N. & Fukunaga, T. (1995). Strength and cross-sectional areas of reciprocal muscle groups in the upper arm and thigh during adolescence. **International Journal of Sports Medicine**, 16: 54-60.

Normative isokinetic torque values for rehabilitation in South Africa

Kannus, P. (1988a). Ratio of of hamstrings to quadriceps femoris muscles' strength in the anterior cruciate ligament insufficient knee. **Physical Therapy, 68: 961-965.**

Kannus, P. (1988b). Relationship between peak torque and total work in an isokinetic contraction of the medial collateral ligament insufficient knee. **International Journal of Sports Medicine, 9: 294-296.**

Kannus, P. & Jarvinen, M. (1989). Prediction of torque acceleration energy and power of thigh muscles from peak torque. **Medicine and Science in Sports and Exercise, 21: 304-307.**

Kannus, P. & Latvala, K. (1989). Torque acceleration energy, power, and peak torque in thigh muscles after knee sprain. **Canadian Journal of Sports Science, 14: 102-106.**

Kannus, P. (1991). Relationship between peak torque and angle-specific torques in an isokinetic contraction of normal and laterally unstable knee. **Journal of Orthopaedic and Sports Physical Therapy, 13: 89-94.**

and Exercise, 13(2): 77.

Normative isokinetic torque values for rehabilitation in South Africa

Keating, J.L. & Matyas, T.A. (1996). The influence of subject and test design on dynamometric measurements of extremity muscles. **Physical therapy, 76:866-889.**

Kendall, F.P.; McCreary, E.K. & Provance, P.G. (1993). **Muscles testing and function, with posture and pain.** (4th ed.) Baltimore, Maryland: Williams and Wilkens.

Kibler, W.B. (1994). Clinical biomechanics of the elbow in tennis: Implications for evaluation and diagnosis. **Medicine and Science in Sports and Exercise, 26: 1203-1206.**

Kirkendall, D.T. (1979). Comparison of isokinetic power-velocity profiles in various classes of American athletes. PhD diss., Ohio State University. Michigan: University Microfilms.

Kirkendall, D.T.; Davies, G.J.; Leigh, D.H.; Lui, M.L.; Reinbold, T.R. & Wilson, P.K. (1981). Isokinetic characteristics of professional football players. II. Absolute and relative power-velocity relationships [abstract]. **Medicine and Science in Sports and Exercise, 13(2): 77.**

Normative isokinetic torque values for rehabilitation in South Africa

Kleiner, D.M. (1990). The effects of manipulating the speed of maximal isokinetic resistance training on heart rate. **Medicine and Science in Sports and Exercise**, **22(2): S45.**

Kleiner, D.M.; Blessing, D.L.; Mitchell, J.W. & Davis, W.R. (1999). A description of the acute cardiovascular responses to isokinetic resistance at three different speeds. **Journal of Strength and Conditioning Research**, **13(14): 360-366.**

Klentrou, P.P. & Montpetit, R.R. (1991). Physiological and physical correlates of swimming performance. **Journal of Swimming Research**, **7(1): 13-18.**

Knapik, J.J. & Ramos, M.U. (1980). Isokinetic and isometric torque relationships in the human body. **Archives of Physical Medicine and Rehabilitation**, **61(Feb.): 64-67.**

Knapik, J.J.; Bauman, C.L.; Jones, B.H.; Harris, J.M. & Vaughan, L. (1991). Preseason strength and flexibility imbalances associated with athletic injuries in female collegiate athletes. **American Journal of Sports Medicine**, **19: 76-81.**

Komi, P.V. & Bosco, C. (1978). Utilization of stored elastic energy in leg extensor muscles by men and women. **Medicine and Science in Sports**, **10: 261-265.**

Normative isokinetic torque values for rehabilitation in South Africa

Kovaleski, J.E.; Heitman, R.J.; Scaffidi, F.M. & Fondren, F.B. (1992). Effects of isokinetic velocity spectrum exercise on average power and total work. **Journal of Athletic Training, 27: 54-56.**

Kovaleski, J.E. & Heitman, R.J. (1993a). Interaction of velocity and progression order during isokinetic velocity spectrum exercise. **Isokinetics and Exercise Science, 3: 118-123.**

Kramer, J.F. (1990). Effect of hand position on knee extension and knee flexion torques of intercollegiate rowers. **Journal of Orthopaedic and Sports Physical Therapy, 11(8): 367-371.**

Krüger, P.E.; Van Wyk, G.J. & Daehne, H.O. (1992). Prestasieskaal vir knie-evaluering op die Cybex II isokinetiese dinamometer. **Suid-Afrikaanse Tydskrif vir Navorsing in Sport, Liggaamlike Opvoedkunde en Ontspanning 15(2): 17-25.**

Krüger, P.E.; Van Wyk, G.J. & Du Toit, A. (1995). 'n Prestasieskaal vir enkel evaluering op die Cybex II isokinetiese dinamometer. **S.A. Tydskrif vir Navorsing in Sport, Liggaamlike Opvoedkunde en Ontspanning 18(2): 61-74.**

Normative isokinetic torque values for rehabilitation in South Africa

Kues, J.M.; Rothstein, J.M. & Lamb, R.L. (1992). Obtaining reliable measurements of knee extensor torque produced during maximal voluntary contractions: An experimental investigation. **Physical Therapy, 72: 492-501.**

Larsson, L. & Karlsson, J. (1978). Isometric and dynamic endurance as a function of age and skeletal muscle characteristics. **Acta Physiologica Scandinavia, 104: 129-136.**

Larsson, L. (1983). Histochemical characteristics of human skeletal muscle during aging. **Acta Physiologica Scandinavia, 117: 469-471.**

Lexell, J.; Downham, D. & Sjostrom, M. (1986). Distribution of different fiber types in human skeletal muscle. **Journal of Neurological Science, 72: 211-222.**

Lexell, J.; Taylor, C.C. & Sjostrom, M. (1988). Total number, size, and proportion of different fiber types studied in whole vastus lateralis muscle from 15 to 83-year-old men. **Journal of Neurological Science, 84: 275-294.**

Logan, P.; Fornasiero, D.; Abernethy, P. & Lynch, K. (2000). Protocols for the assessment of isoinertial strength. In: **Australian Sports Commission. Physiological tests for elite athletes.** Champaign, Illinois: Human Kinetics.

Normative isokinetic torque values for rehabilitation in South Africa

LoPresti, C. Kirkendall, D.; Street, G. & Dudley, D. (1988). Quadriceps insufficiency following repair of the anterior cruciate ligament. **Journal of Orthopaedic and Sports Physical Therapy, 9: 245–249.**

Lucca, J.A. & Kline, K.K. (1989). Effects of upper and lower limb preference on torque production in the knee flexors and extensors. **Journal of Orthopaedic and Sports Physical Therapy, 11(5): 202-207.**

Marshall, R.N. & Taylor, N.A.S. (1980). The isometric muscle force-velocity

Lunnen, J.D.; Yack, J. & LeVeau, B.F. (1981). Relationship between muscle length, muscle activity, and torque of the hamstrings muscles. **Physical Therapy, 61: 190-195.**

Maxham, T., Seaver, B.L. & Swartz, L.C. (1977). Function of skeletal muscle with

MacDougall, J.D.; Elder, G.C.B.; Sale, D.G.; Moroz, J.R. & Sutton, J.R. (1980). Effect of training and immobilization on human muscle fibers. **European Journal of Applied Physiology 43: 25-34.**

Mollister, W.G., Long, S.O. & Carozzo, J.J. (1991). Isokinetic torque imbalances

Magee, D.J. (1992). **Orthopedic physical assessment.** (2nd ed.) Philadelphia, Pennsylvania: W. B. Saunders Company.

Magnusson, S.P.; Gleim, G.W. & Nicholas, J.A. (1990). Subject variability of shoulder abduction strength testing. **American Journal of Sports Medicine, 18: 349-353.**

Normative isokinetic torque values for rehabilitation in South Africa

Marini, L.; Dell'Arco, P. & Giampa, C. (1985). Reliability of dynamic strength

Malone, T.R.; Blackburn, T.A. & Wallace, L.A. (1980). Knee rehabilitation. **Physical Therapy, 60: 1602-1610.**

Manske, R. & Davies, G.J. The effects of rehabilitation on torque acceleration energy (TAE) in 60 patients with deficits on the index test. **In review.**

Marshall, R.N. & Taylor, N.A.S. (1990). The skeletal muscle force-velocity relationships: Its significance and its measurement. **New Zealand journal of Sports Medicine, 18(1): 8-10.**

Mascaro, T.; Seaver, B.L. & Swanson, L. (1992). Prediction of skating speed with off-ice testing in professional hockey players. **Journal of Orthopaedic and Sports Physical Therapy, 15(2): 92-98.**

McMaster, W.C.; Long, S.C. & Caiozzo, V.J. (1991). Isokinetic torque imbalances in the rotator cuff of the elite water polo player. **American Journal of Sports Medicine, 19: 72-75.**

McMaster, W.C.; Long, S.C. & Caiozzo, V.J. (1992). Shoulder torque changes in the swimming athlete. **American Journal of Sports Medicine, 20: 323 – 327.**

Normative isokinetic torque values for rehabilitation in South Africa

Merlini, L.; Dell'Accio, D. & Granata, C. (1995). Reliability of dynamic strength knee muscle testing in children. **Journal of Orthopaedic and Sports Physical Therapy, 22: 73-76.**

Moffroid, M; Whipple, R.; Hofkosh, J.; Lowman, E.W. & Thistle, H. (1969). A study of isokinetic exercise. **Physical therapy, 49: 735-744.**

Mognoni, P.; Narici, M.V.; Sirtoni, M.D. & Lorenzelli, F. (1994). Isokinetic torques and kicking maximum velocity in young soccer players. **Journal of Sports Medicine and Physical Fitness, 34(4): 357-361.**

Molnar, G.E.; Alexander, G. & Gutfeld, N. (1979). Reliability of quantitative strength measurements in children. **Archives of Physical Medicine and Rehabilitation, 60: 218-221.**

Mookerjee, S.; Bibi, K.W.; Kenney, G.A. & Cohen, L. (1995). Relationship between isokinetic strength, flexibility, and flutter kick speed in female collegiate swimmers. **Journal of Strength and Conditioning Research, 9(2): 71-74.**

Muller, E.A. (1970). Influence of training and of inactivity on muscle strength. **Archives in Physical Medicine and Rehabilitation 51: 449-462.**

Normative isokinetic torque values for rehabilitation in South Africa

Murphy, A.J.; Wilson, G.J. & Pryor, J.F. (1994). The use of the isoinertial force mass relationship in the prediction of dynamic human performance. **European Journal of Applied Physiology, 69(3): 250-257.**

Murphy, A.J. & Wilson, G.J. (1996). Poor correlations between isometric tests and dynamic performance: Relation to muscle activation. **European Journal of Applied Physiology, 73: 353-357.**

Murray, M.S.; Warre, F.R.; Otis, C.J.; Kroll, M. & Wickiewicz, L.T. (1984). Torque-velocity relationship of the knee extensors and flexors muscles in individuals sustaining injuries of the anterior cruciate ligament. **American Journal of Sports Medicine, 12: 436-440.**

Murray, P.M.; Gardner, G.M.; Mollinger, L.A. & Sepic, S.B. (1980). Strength of isometric and isokinetic contractions: Knee muscles of men aged 20 to 86. **Physical Therapy, 60: 412-419.**

Murray, P.M.; Duthie, E.H.; Gambert, S.R.; Sepic, S.B. & Mollinger, L.A. (1985). Age-related differences in knee muscle strength in normal women. **Journal of Gerontology, 40: 275-280.**

Normative isokinetic torque values for rehabilitation in South Africa

- Nakazawa, K.; Kawakami, Y.; Fukunaga, T.; Yano, H. & Miyashita, M. (1993). Differences in activation patterns in elbow flexors during isometric, concentric and eccentric contractions. **European Journal of Applied Physiology**, **66**: 214-220.
- Narici, M.V.; Sirtori, M.D.; Mastore, P. & Mognoni, P. (1991). The effect of range of motion and isometric preactivation on isokinetic torques. **European Journal of Applied Physiology**, **62**: 216-220.
- Negus, R.A.; Rippe, J.M.; Freedson, P. & Michaels, J. (1987). Heart rate, blood pressure, and oxygen consumption during orthopaedic rehabilitation exercise. **Journal of Orthopaedic and Sports Physical Therapy**, **8**: 346-350.
- Nelson, S. and Duncan, P. (1983). Correction of isokinetic torque recordings for the effect of gravity. **Physical Therapy**, **63**: 674 – 676.
- Newberry, J.E.; DeLeon, A.; Merriman, P.J. & Castillo, E.K. (1997). Relationship of isokinetic knee extensor strength and closed kinetic chain functional ability. [Abstract]. **Medicine and Science in Sports and Exercise**, **29(54, Suppl.)**: S9.
- Nicholas, J.A.; Strizak, A.M. & Veras, G. (1976). A study of thigh muscle weakness in different pathological states of the lower extremity. **American Journal of Sports Medicine**, **4**: 241-248.

Normative isokinetic torque values for rehabilitation in South Africa

Osternig, L.R. (1975). Optimal isokinetic loads and velocities producing muscular

Nicholas, J.J.; Robinson, L.R.; Logan, A. & Robertson, R. (1989). Isokinetic testing in young non-athletic able-bodied subjects. **Archives of Physical Medicine and Rehabilitation, 70: 210 – 213.**

Osternig, L.R. (1995). Optimal isokinetic loading and velocities producing

Nosse, L.J. (1982). Assessment of selected reports on the strength relationship of the knee musculature. **Journal of Orthopaedic and Sports Physical Therapy, 4: 78-85.**

Osternig, L.R.; Hamel, J.; Linder, J.E. & Robertson, R. (1991). Co-activation of

Noyes, F.R.; Barber, S.D.; & Mangine, R.E. (1991). Abnormal lower limb symmetry determined by functional hop test after anterior cruciate ligament rupture. **American Journal of Sports Medicine, 19: 513-518.**

Ols, J.C.; Wilton, R.F.; Roberts, S.; Sargent, T.J. & Murray, P. (1988). Torque

Nunn, K.D. & Mayhew, J.L. (1988). Comparison of three methods of assessing strength imbalances at the knee. **Journal of Orthopaedic and Sports Physical Therapy, 10(4): 134-137.**

Pappas, A.M.; Zawack, P.M. & Sullivan, T.P. (1987). Comparison of isometric

Olerud, S.; Wallenstein, R. & Olsson, E. (1984). Muscle strength after bilateral femoral osteotomy. **Journal of Bone and Joint Surgery, 66(6): 792–793.**

Paterson, M.E., Nelson, S.G. & Duncan, P.W. (1984). Effects of vibrating the

non-tested lower extremity during isokinetic evaluation of the quadriceps

Normative isokinetic torque values for rehabilitation in South Africa

Osternig, L.R. (1975). Optimal isokinetic loads and velocities producing muscular power in humans. **Archives of Physical Medicine and Rehabilitation, 56: 152-155.**

Peacock, B., Westers, S., Walsh, S. & Nicholson, N. (1981). Feedback and

Osternig, L.R. (1986). Optimal isokinetic loading and velocities producing muscular power in human subjects. **Archives of Physical Medicine and Rehabilitation, 50: 152-155.**

Roberts, D., Long, J. & Howard, V. (1982). The relationship of upper extremity strength to throwing speed. *American Journal of*

Osternig, L.R.; Hamill, J.; Lander, J.E. & Robertson, R. (1986). Co-activation of sprinter and distance runner muscles in isokinetic exercise. **Medicine and Science in Sports and Exercise, 18(4): 431-435.**

Neuromuscular and metabolic alterations with age leading to injury. *Journal of*

Otis, J.C.; Warren, R.F.; Backus, S.I.; Santner, T.J. & Mabrey, J.D. (1990). Torque production in the shoulder of the normal young adult male. **American Journal of Sports Medicine, 18: 119-123.**

Brody, R.L. (1987). Isokinetic peak torque, torque acceleration energy, power, and work relationships in athletes and non-

Pappas, A.M.; Zawacki, R.M. & Sullivan, T.J. (1985). Biomechanics of baseball pitching: A preliminary report. **American Journal of Sports Medicine, 13(4): 216-222.**

Human Kinetics.

Patteson, M.E., Nelson, S.G. & Duncan, P.W. (1984). Effects of stabilizing the non-tested lower extremity during isokinetic evaluation of the quadriceps and

Normative isokinetic torque values for rehabilitation in South Africa

- hamstrings. **The Journal of Orthopaedic and Sports Physical Therapy** **6(1): 18-20.**
- and closed kinetic chain assessment of knee strength and functional performance. *Clinical Journal of Sports Medicine*, **7(1): 11-16.**
- Peacock, B.; Westers, S.; Walsh, S. & Nicholson, K. (1981). Feedback and maximum voluntary contraction. **Ergonomics**, **24: 223-228.** Effects of rest interval on isokinetic strength and functional performance after short term high intensity
- Pedegana, L.R.; Elsner, R.C.; Roberts, D; Lang, J. & Farewell, V. (1982). The relationship of upper extremity strength to throwing speed. **American Journal of Sports Medicine**, **10(6): 352-354.** isokinetic torque profile of Greek elite soccer players. *Journal of Orthopaedic and Sports Physical Therapy*, **8: 293-298.**
- Pendergast, D.R.; Fisher, N.M. & Calkins, E. (1993). Cardiovascular, Neuromuscular, and metabolic alterations with age leading to frailty. **Journal of Gerontology**, **48: 60-67.** muscle torque output in various speeds in soccer ball velocity. *Journal of Orthopaedic and Sports Physical Therapy*, **10: 93-98.**
- Perrin, D.H.; Robertson, R.J. & Gray, R.L. (1987). Bilateral isokinetic peak torque, torque acceleration energy, power, and work relationships in athletes and non-athletes. **Journal of Orthopaedics and Sports Physical Therapy**, **9: 184-189.**
- Movement Studies*, **27:163-172.**
- Perrin, D.H. (1993). **Isokinetic exercise and assessment.** Champaign, Illinois: Human Kinetics.
- Johns, K.M.; Yang, A.N.; Leverage, P.K. & Morrissey, M. (1991). Effects of different acceleration and deceleration rates on knee joint

Normative isokinetic torque values for rehabilitation in South Africa

Pincivero, D.M.; Lephart, S.M. & Karunakara, R.G. (1997a). Relation between open and closed kinetic chain assessment of knee strength and functional performance. **Clinical Journal of Sports Medicine, 7(1): 11-16.**

Pincivero, D.M.; Lephart, S.M. & Karunakara, R.G. (1997b). Effects of rest interval on isokinetic strength and functional performance after short term high intensity training. **British Journal of Sports Medicine, 31: 229-234.**

Poulmedis, P. (1985). Isokinetic maximal torque power of Greek elite soccer players. **Journal of Orthopaedic and Sports Physical Therapy, 6: 293-295.**

Poulmedis, P.; Rondooyannis, G.; Mitsou, A. & Tsarouchas, E. (1988). The influence of isokinetic muscle torque exerted in various speeds on soccer ball velocity. **Journal of Orthopaedic and Sports Physical Therapy, 10: 93-96.**

Pryor, J.F.; Wilson, G.J. & Murphy, A.J. (1994). The effectiveness of eccentric, concentric and isometric rate of force development tests. **Journal of Human Movement Studies, 27:153-172.**

Rathfon, J.A.; Matthews, K.M.; Yang, A.N.; Levangie, P.K. & Morrissey, M.C. (1991). Effects of different acceleration and deceleration rates on isokinetic

Normative isokinetic torque values for rehabilitation in South Africa

performance in knee extensors. **Journal of Orthopaedic and Sports Physical Therapy, 14: 161-168.**

Richter, K.J. (1992). Subcutaneous hemorrhage in a patient on coumadin: An isokinetic exercise complication. **Journal of Sport Rehabilitation, 1: 264-266.**

Sports Medicine, 17: 769-795.

Roemmich, J.N. & Sinning, W.E. (1997). Weight loss and wrestling training: Effects on nutrition, growth, maturation, body composition, and strength. **Journal of Applied Physiology, 82: 1751-1759.**

Elite Athlete. Champaign, IL: Human Kinetics.

Roetert, E.P.; McCormick, T.J.; Brown, S.W. & Ellenbecker, T.S. (1996). Relationship between isokinetic and functional trunk strength in elite junior tennis players. **Isokinetics and Exercise Science, 6: 15-20.**

Journal of Applied Physiology, 82: 1755-1761.

Rogers, M.A. & Evans, W.J. (1993). Changes in skeletal muscle with aging: Effects of exercise training. In: Holoszy, J.O. (ed.). **Exercise and Sport Sciences Reviews (Vol. 21).** Baltimore: Williams & Wilkins.

Elite Athlete. Champaign, IL: Human Kinetics.

Rothstein, J.M.; Lamb, R.L. & Matthew, T.P. (1987). Clinical uses of isokinetic measurements: critical issues. **Physical Therapy, 67(12): 1840-1844.**

torque "overflow" in Cybex isokinetic dynamometry. Medicine and Science in Sports and Exercise, 14: 369-374.

Normative isokinetic torque values for rehabilitation in South Africa

Rutherford, O. (1988). Muscular coordination and strength training: implications for injury prevention. **Sports Medicine, 5: 196–202.**

Journal of Bone and Joint Surgery, 72(1): 1662-1674.

Sachs, R.A.; Adniel, D.M.; Stone, M.L. & Carfein, F.R. (1989). Patellofemoral problems after anterior cruciate ligament reconstruction. **American Journal of Sports Medicine, 17: 760-765.**

Journal of Orthopaedic and Sports Physical Therapy, 8(8): 343-345.

Sale, D.G. & Norman, R. (1982). Testing strength and power. In: MacDougall, J.D.; Wenger, H.A. & Green, H.J. (eds.), (1991). **Physiological Testing of the Elite Athlete.** Champaign, IL: Human Kinetics.

Sale, D.G.; MacDougall, J.D.; Always, S.E. & Sutton, J.R. (1987). Voluntary strength and muscle characteristics in untrained men and women and male bodybuilders. **Journal of Applied Physiology, 62: 1786-1793.**

Physical Therapy, 25: 203-207.

Sale, D.G. (1991). Testing strength and power. In: MacDougall, J.D.; Wenger, H.A. & Green, H.J. (eds.). **Physiological Testing of the High-performance Athlete.** Champaign, IL: Human Kinetics.

Medicine and Rehabilitation, 61: 65-73.

Sapega, A.A.; Nicholas, J.; Sokolow, D. & Sarantini, A. (1982). The nature of torque “overshoot” in Cybex isokinetic dynamometry. **Medicine and Science in Sports and Exercise, 14: 368–375.**

Normative isokinetic torque values for rehabilitation in South Africa

Sokolowicz, D.M. (1985). Improvement in isometric strength of the quadriceps

Sapega, A.A. (1990). Muscle performance evaluation in orthopaedic practice.

Journal of Bone and Joint Surgery, 72(1): 1562-1574.

Schlinkman, B. (1984). Norms for high school football players derived from Cybex data reduction computer. **Journal of Orthopaedic and Sports Physical Therapy, 5(5): 243-245.**

American Journal of Sports Medicine, 10: 188-191.

Schmidtbleicher, D. (1992). Training for power events. In: Komi, P.V. (ed.).

Strength and Power in Sport. Oxford: Blackwell Scientific.

Clinical applications. Dyr, Z. (ed). Edinburgh, UK: Churchill Livingstone.

Scoville, C.R.; Arciero, R.A. & Taylor, D.C. (1997). End range eccentric antagonistic/concentric agonistic strength ratios: A new perspective in shoulder strength assessment. **Journal of Orthopaedic and Sports Physical Therapy, 25: 203-207.**

Scudder, G.N. (1980). Torque curves produced at the knee during isometric and isokinetic exercise. **Archives of Physical Medicine and Rehabilitation, 61: 68-73.**

Physical Therapy, 74: 234-244.

Smith, G.L. & Rogers, M.W. (1962). Factors contributing to the regularity of

clinical assessment of muscular strength. *Physical Therapy, 42: 1211-1216.*

Normative isokinetic torque values for rehabilitation in South Africa

Selkowitz, D.M. (1985). Improvement in isometric strength of the quadriceps femoris muscle after training with electrical stimulation. **Physical Therapy, 65(2): 186-196.**

Sherman, W.; Pearson, D.; Plyley, M.; Costill, A. & Habansky, A. (1982). Isokinetic rehabilitation after surgery: A review of factors which are important for developing physiotherapeutic techniques after knee surgery. **American Journal of Sports Medicine, 10: 155–161.**

Shklar, A. & Dvir, Z. (1995). In: **Isokinetics: Muscle testing, interpretation and clinical applications.** Dvir, Z. (ed.). Edinburgh, UK: Churchill Livingstone.

Simoneau, G.G. (1990). Isokinetic characteristics of ankle evertors and invertors in female control subjects using the Biodex dynamometer. **Physiotherapy Canada, 42(4): 182-187.**

Sinacore, D.R; Bander, B.L. & Delitto, A. (1994). Recovery from a 1-minute bout of fatiguing exercise: Characteristics, reliability, and responsiveness. **Physical Therapy 74: 234-244.**

Smidt, G.L. & Rogers, M.W. (1982). Factors contributing to the regulation and clinical assessment of muscular strength. **Physical Therapy, 62: 1283-1290.**

Normative isokinetic torque values for rehabilitation in South Africa

- Stanley, S.N. & Taylor, N.A.S. (1993). Isokinetic muscle mechanics in full range of motion. *Journal of Electromyography and Kinesiology*, 3: 10-14.
- Smith, D.J.; Quinney, H.A.; Wenger, H.A.; Steadward, R.D. & Sexsmith, J.R. (1981). Isokinetic torque outputs of professional and elite amateur ice hockey players. **Journal of Orthopaedic and Sports Physical Therapy**, 3: 42-47.
- Talag, T. (1973). Residual muscle soreness as influenced by concentric, eccentric and isometric exercise. *Physical Therapy*, 53: 10-14.
- Smith, D.J.; Quinney, H.A.; Steadward, R.D. & Sexsmith, J.R. (1982). Physiological profiles of the Canadian Olympic hockey team (1980). **Canadian Journal of Applied Sport Sciences**, 7: 142-146.
- Stulen, F.J. (1990). Differences in coordination of elbow flexor muscles in force and speed movement tests. *Journal of Electromyography and Kinesiology*, 60: 100-104.
- Snyder-Mackler, L.; Garret, M. & Roberts, M. (1989). A comparison of torque generating capabilities of three different electrical stimulation currents. **Journal of Orthopaedic and Sports Physical Therapy**, February: 297-301.
- Snyder-Mackler, L.; Delitto, A. & Bailey, S.L. (1995). Strength of the quadriceps femoris muscle and functional recovery after reconstruction of the anterior cruciate ligament. **Journal of Bone and Joint Surgery**, 77A: 116-173.
- Stafford, M.G. & Grana, W.A. (1984). Hamstrings/quadriceps ratio in college football players: A high velocity evaluation. **American Journal of Sports Medicine**, 12: 209-211.
- Stulen, F.J.; Deder van der Gort, J.J. & Beelen, C.A.M. (1995). Changes in recruitment order of motor units in the human biceps muscle. *Experimental Neurology*, 78: 380-388.

Normative isokinetic torque values for rehabilitation in South Africa

Stanley, S.N. & Taylor, N.A.S. (1993). Isokinematic muscle mechanics in four groups of women of increasing age. **European Journal of Applied Physiology, 66: 178-184.**

Talag, T. (1973). Residual muscle soreness as influenced by concentric, eccentric and static contractions. **Research Quarterly, 44: 458-469.**

Tax, A.A.M.; Denier van der Gon, J.J. & Erkelens, C.J. (1990). Differences in coordination of elbow flexor muscles in force tasks and in movement tasks. **Experimental Brain Research, 81: 567-572.**

Taylor, N.A.S.; Sanders, H.A.; Howick, E.I. & Stanley, S.N. (1991). Static and dynamic assessment of the Biodex dynamometer. **European Journal of Applied Physiology, 62(3): 180-188.**

Tegner, Y.; Lysholm, J.; Lysholm, M. & Gilquist, J. (1986). A performance test to monitor rehabilitation and evaluate anterior cruciate ligament injuries. **American Journal of Sports Medicine, 14: 156-159.**

Ter Haar Romeny, B.M.; Denier van der Gon, J.J. & Gielen, C.A.M. (1982). Changes in recruitment order of motor units in the human biceps muscle. **Experimental Neurology, 78: 360-368.**

Normative isokinetic torque values for rehabilitation in South Africa

- 2000 isokinetic dynamometer. *Journal of Orthopaedic and Sports Physical Therapy*, 20(1): 1-6.
- Ter Haar Romeny, B.M.; Denier van der Gon, J.J. & Gielen, C.A.M. (1984). Relationship between location of a motor unit in the human biceps brachii and its critical firing levels for different tasks. **Experimental Neurology**, 85: 631-650.
- Fore composition in athletes and sedentary men. *Medicine and Science in Sports and Exercise*, 19(1): 1-6.
- Thistle, H.; Hislop, H.; Moffroid, M.; & Lohman, E.W. (1967). Isokinetic contraction: A new concept of resistive exercise. **Archives of Physical Medicine and Rehabilitation**, 48: 279-282.
- The testing and rehabilitation system. *Journal of Orthopaedic and Sports Physical Therapy*, 6(1): 21-24.
- A compendium of isokinetics in clinical usage. *University of Wisconsin Press*, 1984.
- Thomas, L.E. (1984). Isokinetic torque levels for adult females: Effects of age and body size. **Journal of Orthopaedic and Sports Physical Therapy**, 6(1): 21-24.
- User's Guide: Norm testing and rehabilitation system. *New York: Cybex*, 1984.
- Thomee, R.; Renstrom, P.; Grimby, G. & Peterson, L. (1987). Slow and fast isokinetic training after knee ligament surgery. **Journal of Orthopaedic and Sports Physical Therapy**, 8: 475-479.
- Van Raaij, M.A.; De Bont, J.H.; D.G.; Spith, L. & Smit, W.H.M. (1990). Reliability of tests to determine peak aerobic power. *Journal of Sports Sciences*, 8: 1-6.
- Thompson, N.N.; Gould, J.A.; Davies, G.J.; Ross, D.E. & Price, S. (1985). Descriptive measurements of isokinetic trunk testing. **Journal of Orthopaedic and Sports Physical Therapy**, 7(2): 43-49.
- VanCheluwa, B. & Hobbeltrek, M. (1989). Muscle actions and ground reaction forces during isokinetic knee extension. *Journal of Orthopaedic and Sports Physical Therapy*, 10(1): 1-6.
- Thompson, M.C.; Shingleton, L.G. & Kegerreis, S.T. (1989). Comparison of values generated during testing of the knee using the Cybex II Plus and Biodex Model B-

Normative isokinetic torque values for rehabilitation in South Africa

2000 isokinetic dynamometers. **Journal of Orthopaedic and Sports Physical Therapy, 11(3): 108-115.**

Thorstensson, A.; Larsson, L.; Tesh, P. & Karlsson, J. (1977). Muscle strength and fibre composition in athletes and sedentary men. **Medicine and Science in Sports and Exercise 9(1): 26-30.**

Timm, K.E. (1992). Lumbar spine testing and rehabilitation. In: Davies, G.J. (ed.) **A compendium of isokinetics in clinical usage.** Onalaska, Wisconsin: S & S Publishers.

Weir, J.P.; Housh, T.J.; Johnson, G.O.; Housh, D.J. & Edwards, K.T. (1990). **User's Guide: Norm testing and rehabilitation system.** New York, Ronkonkoma: CYBEX International, Inc. (1996).

Van den Berg-Emons, R.J.G.; Van Baak, M.A.; De Barbanson, D.C.; Speth, L. & Saris, W.H.M. (1996). Reliability of tests to determine peak aerobic power, anaerobic power, and isokinetic muscle strength in children with spastic cerebral palsy. **Developmental Medicine and Child Neurology, 38: 1117-1125.**

VanGheluwe, B. & Hebbelinck, M. (1986). Muscle actions and ground reaction forces in tennis. **International Journal of Sport Biomechanics, 2: 88-99.**

Normative isokinetic torque values for rehabilitation in South Africa

VanSwearingen, J.M. (1983). Measuring wrist muscle strength. **Journal of Orthopaedic and Sports Physical Therapy, 4: 217–228.**

Wang, H.-K.; Macfarlane, A. & Cochrane, T. (2000). Isokinetic performance and shoulder mobility in elite volleyball athletes from the United Kingdom. **British Journal of Sports Medicine, 34: 39-43.**

Watkins, P.M.; Harris, A.B. & Kozlowski, B.A. (1984). Isokinetic training in patients with hemiparesis. **Physical Therapy, 64: 184–189.**

Weir, J.P.; Housh, T.J.; Johnson, G.O.; Housh, D.J. & Ebersole, K.T. (1990). Allometric scaling of isokinetic peak torque: The Nebraska wrestling study. **European Journal of Applied Physiology, 80: 240-248.**

Weir, J.P.; Wagner, L.L.; Housh, T.J.; Johnson, G.O. (1992). Horizontal abduction and adduction Strength at the shoulder of high school wrestlers across age. **Journal of Orthopaedic and Sports Physical Therapy, 15(4): 183-186.**

Weir, J.P. (2000). Youth and isokinetic testing. In: Brown, L.E. (ed.). **Isokinetics in human performance.** Champaign, Illinois: Human Kinetics.

Normative isokinetic torque values for rehabilitation in South Africa

Weldon, G.; Snouse, S.L. & Shultz, S. (1988). Normative strength values for knee, shoulder, elbow, and ankle for females ages 9-73 as determined by isokinetic testing. **Athletic Training, 23: 325-331.**

Wessel, J.; Ford, D. & Van Driesum, D. (1992). Measurement of torque of trunk flexors at different velocities. **Scandinavian Journal of Rehabilitation Medicine, 24: 175-180.**

Westing, S.; Seger, J.; Karlson, E. & Ekblom, E. (1988). Eccentric and concentric torque-velocity characteristics of the quadriceps femoris in man. **European Journal of Applied Physiology, 58: 100-104.**

Wiklander, J. & Lysholm, J. (1987). Simple tests for surveying muscle strength and muscle stiffness in sportsmen. **International Journal of Sports Medicine, 8: 50-54.**

Wilhite, M.R.; Cohen, E.R. & Wilhite, S.C. (1992). Reliability of concentric and eccentric measurements of quadriceps performance using the KIN-COM dynamometer: The effect of testing order for three different speeds. **Journal of Orthopaedic and Sports Physical Therapy, 15(4): 175-182.**

Normative isokinetic torque values for rehabilitation in South Africa

Wilk, K.E., Arrigo, C.A. & Andrews, J.A. (1991). Standardized isokinetic testing protocol for the throwing shoulder. **Isokinetics and Exercise Science**, 1(2): 63-71.

Wilk, K.E.; Arrigo, C.A. & Andrews, J.R. (1992). Isokinetic testing of the shoulder abductors and adductors: Windowed vs nonwindowed dat collection. **Journal of Orthopaedic and Sports Physical Therapy**, 15(2): 107-111.

Wilk, K.E. & Andrews, J.R. (1993). The effects of pad placement and angular velocity on tibial displacement during isokinetic exercise. **Journal of Orthopaedic and Sports Physical Therapy**, 17: 223-230.

Wilk, K.E.; Romanillo, W.T. & Soscia, S.M. (1994). The relationship between subjective knee scores, isokinetic testing, and functional testing in the ACL-reconstructed knee. **Journal of Orthopaedic and Sports Physical Therapy**, 20: 60-73.

Wilson, G.J.; Lytle, A.D.; Ostrowski, K.J. & Murphy, A.J. (1995). Assessing

Wilmore, J.H. & Costill, D.C. (1999). **Physiology of sport and exercise**. 2nd ed. Champaign, Illinois: Human Kinetics.

Normative isokinetic torque values for rehabilitation in South Africa

Wilson, G.J.; Wood, G.A. & Elliot, B.C. (1991). Optimal stiffness of the series elastic component in a stretch shorten cycle activity. **Journal of Applied Physiology**, **70**: 825-833.

Wilson, G.J.; Newton, R.U.; Murphy, A.J. & Humphries, B.J. (1993). The optimal training load for the development of dynamic athletic performance. **Medicine and Science in Sports and Exercise**, **25(11)**: 1279-1286.

Wilson, G.J.; Murphy, A.J. & Pryor, J.F. (1994). Musculo-tendinous stiffness: Its relationship to eccentric, isometric and concentric performance. **Journal of Applied Physiology**, **76(6)**: 2714-2719.

Wilson, G.J. & Murphy, A.J. (1995). The efficacy of isokinetic, isometric and vertical jump tests in exercise science. **Australian Journal of Science and Medicine in Sport**, **27(1)**: 62-66.

Wilson, G.J.; Lyttle, A.D.; Ostrowski, K.J. & Murphy, A.J. (1995). Assessing dynamic performance: A comparison of rate of force development tests. **Journal of Strength and Conditioning Research**, **9(3)**: 176-181.

Normative isokinetic torque values for rehabilitation in South Africa

Wilson, G.J. (2000). Limitations to the use of isometric testing in athletic assessment. In: Australian Sports Commission. **Physiological tests for elite athletes**. Champaign, IL: Human Kinetics.

Wrigley, T.V. (2000). Correlations with athletic performance. In: *Isokinetics in*

Winter, D.A.; Wells, R.P. & Orr, G.W. (1981). Errors in the use of isokinetic dynamometers. **European Journal of Applied Physiology, 46: 397–408.**

Wysh, M.P. & Edwards, A.M. (1967). Comparison of quadriceps and hamstrings

Wojtys, E.M. & Huston, L.J. (1994). Neuromuscular performance in normal and anterior cruciate ligament-deficient lower extremities. **American Journal of Sports Medicine, 22: 89-104.**

Yamamoto, T. (1993). Relationship between hamstrings strain and leg muscle

Wong, D.L.K.; Glasheen-Wray, M. & Andrews, L.F. (1984). Isokinetic evaluation of the ankle invertors and evertors. **Journal of Orthopaedic and Sports Physical Therapy, 5(5): 246-252.**

of contraction on strength, muscular power and functional development

Worrel, T.W.; Perrin, D.H.; Gansneder, B.M. & Gieck, J.H. (1991). Comparison of isokinetic strength and flexibility measurements between hamstrings injured and non-injured athletes. **Journal of Orthopaedic and Sports Physical Therapy, 13: 118-125.**

Wrigley, T.V. & Strauss, G.R. (1989). Isokinetic dynamometry: Standardized assessment of strength and power of athletes. In: **Test methods manual: Sport**

Normative isokinetic torque values for rehabilitation in South Africa

specific guidelines for the physiological testing of the elite athlete. Gore, C. (ed.). Canberra: Australian Sports Commission.

Wrigley, T.V. (2000). Correlations with athletic performance. In: **Isokinetics in human performance.** Brown, L.E. (ed.). Champaign, Illinois: Human Kinetics.

Wyatt, M.P. & Edwards, A.M. (1981). Comparison of quadriceps and hamstrings torque values during isokinetic exercise. **Journal of Orthopaedic and Sports Physical Therapy, 3: 48–56.**

Yamamoto, T. (1993). Relationship between hamstrings strains and leg muscle strength. **Journal of Sports Medicine and Physical Fitness, 33(2): 194-199.**

Young, W.B. & Bilby, G.E. (1993). The effect of voluntary effort to influence speed of contraction on strength, muscular power and hypertrophy development. **Journal of Strength and Conditioning Research, 7: 172-178.**