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BIBLIOGRAPHY

1. Abramson JL, Vaccarino V. Relationship between physical activity and inflammation among apparently healthy middle-aged and older US adults. *Arch Intern Med* 2002; 162: 1286-1292.
2. ACSM Position Stand. The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness and flexibility in healthy adults. *Med Sci Sports Exerc* 1998a;30:975-991.
3. ACSM. Guidelines for Exercise testing and Prescription, 4th Ed.. Philadelphia: Lea & Fabinger, 1991.
4. ACSM. Position Stand on Exercise and Physical Activity for Older Adults. *Med Sci Sports Exerc* 1998;30(6): 992-1008.
5. Adams KF, et al. Overweight, obesity, and mortality in a large prospective cohort of persons 50 to 71 years old. *N Engl J Med* 2006; 355: 763-78
6. Agostoni PG, Bianchi M, Moraschi A, Palermo P, Cattadori G, La Gioia R, et al. Work rate affects cardiopulmonary exercise test results in heart failure. *Eur J Heart Fail* 2005, 7: 498-504.
7. Agostoni PG, Cattadori G, Apostolo A, Contini M, Palermo P, Marenzi GC. Non invasive measurement of cardiac output during exercise by inert gas re-breathing technique: a new tool for heart failure evaluation. *J Am Coll Cardiol* 2005; 46: 1779-1781.
8. Agostoni PG, Pellegrino R, Conca C, Rodarte J, Brusasco V. Exercise hyperpnoea in chronic heart failure: relation to lung stiffness and exercise flow limitation. *J Appl Physiol* 2002; 92: 1409-1416.
9. American College of Obstetricians and Gynecologists: Technical Bulletin. Exercise during pregnancy and the post-partum period. Washington DC: ACOG, 1994.
10. American College of Sports Medicine and American Heart Association. ACSM/AHA Joint Position Statement: Recommendations for cardiovascular screening, staffing, and emergency policies at health/fitness facilities. *Medicine and Science in Sports and Exercise* 1998;1018.
11. American College of Sports Medicine Position Stand. Exercise and physical activity for older adults. *Med Sci Sports Exerc*. 1998 Jun;30(6):992-1008.
12. American College of Sports Medicine/American Heart Association Recommendations. Physical activity and public health in older adults. Nelson M.E., Rejeski W.J., Blair S.N., Duncan P.W., Judge J.O., King A.C., Macera C.A., Castaneda-Sceppa C. *Circulation* 2007;116:1094-1105.
13. American Diabetes Association. Position statement: "Physical Activity Exercise and Diabetes Mellitus". *Diabetes Care* 2003 ; 26: S 73 - S77.
14. ATS Board of Directors, March 2002. ATS Statement: Guidelines for the six-minute walk test. *Am J Respir Crit Care Med* 2002; 166: 111-117.
15. Baratto L, Morasso PG, Re C, Spada G, A new look at posturographic analysis in the clinical context: sway-density vs. other parametrization technique, in Motor Control, 2002.

- 16.** Blair SN, Kohl HW 3rd, Barlow CE, Paffenbarger RS Jr, Gibbons LW, Macera CA. Changes in physical fitness and all-cause mortality. A prospective study of healthy and unhealthy men. *JAMA* 1995; 273: 1093-1098.
- 17.** Booth FW, Gordon SE, Carlson CJ, et al. Waging war on modern chronic diseases: primary prevention through exercise biology. *J Appl Physiol* 2000; 88: 774-787.
- 18.** Booth FW, Gordon SE, Carlson CJ, Hamilton MT. Waging war on modern chronic diseases: primary prevention through exercise biology. *J Appl Physiol* 2000; 88: 774-87.
- 19.** Bricot B, La riprogrammazione posturale globale, ed Statipro:Milano, 1998.
- 20.** Bugnariu N., Fung J. (2007). Aging and selective sesorimotor strategies in the regulation of upright balance. *Journal of NeuroEngineering and rehabilitation*, 4:19;
- 21.** Buizza A, Schmid M, Secco EL, Lombardi R, Gandolfi R, La coordinazione intersegmentaria in posturografia, workshop Posturologia clinica e controllo posturale, Arenzano April 8-9, 2002.
- 22.** Cappello, Cappozzo A, Prampero PE, Bioingegneria della postura e del movimento, Pàtron editore:Bologna, 2003.
- 23.** Carle F, Gesuita R et al.: Diabetes incidence in 0- to 14- year age-groupi n Italy: a 10- year prospective study. *Diabetes Care* 27: 2790-2796, 2004.
- 24.** Castaneda C, Layne JE et al. A radomize controlled trial of resistance exercise training to improve glycemic control in older adults with type 2 diabetes. *Diabetes care* 25: 2335-2341, 2002.
- 25.** Cecchi F, Ceppatelli S, Pini ME, Corradini ML, Benvenuti E, Corigliano A, Debolini PL. Riabilitazione ed esercizio fisico nell'anziano affetto da patologia muscolo-scheletrica. *Europa Medicophysica*, 2001; 37: 190-192.
- 26.** Church TS, Cheng YJ et al. exercise capacity and body composition as predictors of mortality among men with diabetes. *Diabetes Care* 27: 83-88, 2004.
- 27.** Coats AJ, Adamopoulos S, Radaelli A, McCance A, Meyer TE, Bernardi L, et al. Controlled trial of physical training in chronic heart failure. Exercise performance, hemodynamics, ventilation, and autonomic function. *Circulation* 1992; 85: 2119-2131.
- 28.** Consensus Statement of Multisocietary Task Force Prescription of physical exercise in the cardiological environment (First part). *Monaldi Arch Chest Dis* 2007; 68: 13-30
- 29.** Cremonini G, Cavazzuti F, Testoni Bacia M, Anziani invecchiamento e attività motoria, Casa editrice Ambrosiana: Milano, 1991.
- 30.** Di Loreto C, Fanelli C et al.: Validation of a counseling strategy to promote the adoption and the maintenance of physical activity by type 2 diabetic subjects. *Diabetes Care* 26: 404-408, 2003.
- 31.** Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 2002; 346: 393-403.

32. Dunstan DW, Daly RM et al. High-intensity resistance training improves glycemic control in older patients with type 2 diabetes. *Diabetes Care* 25: 1729-1736, 2002.
33. Ellis S. R. (1996). What Are Virtual Environments? *IEEE Computer Graphics and Applications*, 14(1), 17-22;
34. Emmerik RE, Wegen EE, On the functional aspect of variability in postural control, *Exercise and sport science reviews* 30, 2002.
35. Era P, Heikkinen E, Postural sway during standing and unexpected disturbances of balance in random samples of men of different ages. *Journal of Gerontology* 40, 1985.
36. Eriksson G, Liestol K, Bjornholt J, Thaulow E, Sandvik L, Eriksson J. Changes in physical fitness and changes in mortality. *Lancet* 1998; 352: 759-762.
37. Evans WJ. Exercise training guidelines for the elderly. *Med Sci Sports Exerc* 1999;31(1):12-7.
38. Executive summary of the clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults. *Arch Intern Med* 1998; 158: 1855-67
39. Flegal KM, et al. Excess deaths associated with underweight, overweight, and obesity. *JAMA* 2005; 293: 1861-7
40. Gerich JE.: The genetic basis of type 2 diabetes mellitus: impaired insulin secretion versus impaired insulin sensitivity. *Endocr Rev* 19: 491-503, 1998.
41. Haskell WL. Cardiovascular complications during exercise training of cardiac patients. *Circulation* 1978;57:920-924.
42. Haslam DW, James WP. Obesity. *Lancet* 2005; 366: 1197-209
43. Hass J, Waddell Dwight E, Wolf SL., Juncos JL., Gregor RJ, Gait initiation in older adults with postural instability, *Clinical Biomechanics* 23, 2008, 743-753.
44. Hayashi R, Miyake A, Watanabe S. (1998). The functional role of sensory inputs from the foot: stabilizing human standing posture during voluntary and vibration-induced sway. *Neurosci. Res.* 5:203-213;
45. Hays LM, Clark DO. Correlates of physical activity in a sample of older adults with type 2 diabetes. *Diabetes Care* 22: 706-712, 1999.
46. Heasley k, Buckley JG, Scally A, Twigg P, David BE, Falls in Older People: Effects of Age and Blurring Vision on the Dynamics of Stepping, *Investigative ophthalmology & visual science*, 2005 Oct;46(10).
47. Hernandez A, Silder A, Heiderscheit C, Darryl G, Thelen, Effect of age on center of mass motion during human walking, *Gait & Posture* 30, 2009, 217-222.
48. Hoberg E, Schuler G, Kunze B, et all. Silent myocardial ischemia as a potential link between lack of premonitoring symptoms and increased risk of cardiac arrest during physical stress. *Am J Cardiol* 1990;65:583-589.
49. Hu FB, Stampfer MJ et al. Physical activity and risk for cardiovascular events in diabetic women. *Ann Intern Med* 134: 96-105, 2001.
50. Ivy JL. Role of exercise training in the prevention and treatment of insulin resistanceand non-insulin-dependent diabetes mellitus. *Sports med* 24: 321-336, 1997.

51. Jones TF, Eaton CB. Cost-benefit analysis of walking to prevent coronary heart disease. *Arch Fam Med* 1994; 3: 703-710.
52. Keshner EA, Kenyon RV (2004). Using immersive technology for postural research and rehabilitation. *Assist Technol* , 16:54-62.
53. Keshner EA, Kenyon RV, Dhaher Y(2004). Postural research and rehabilitation in an immersive environment. Proceedings of the 26th Annual International Conference of the IEEE EMBS:4862-4865;
54. Keshner EA, Kenyon RV, Langston JL (2004). Postural responses exhibit multisensory dependencies with discordant visual and support motion. *J Vestib Res* , 14:307-319;
55. Kokkinos PF, Narayan P, Colleran JA, Pittaras A, Notargiacomo A, Reda D, et al. Effects of regular exercise on blood pressure and left ventricular hypertrophy in African-American men with severe hypertension. *N Engl J Med* 1995; 333: 1462-1467.
56. Laufs U, Wassmann S, Czech T, Munzel T, Eisenhauer M, Bohm M, et al. Physical inactivity increases oxidative stress, endothelial dysfunction and atherosclerosis. *Arterioscl Throm Vasc Biol* 2005; 25: 809-814.
57. Lenzi D, Cappello A, Chiari L, Influecnce of body segment parameters and modelling assumption of the estimate of center of mass trajectory, *Journal of biomechanics*, 36, 2003.
58. Leslie, D. Mature stuff: Physical activity for the older adult Reston VA: Council on Aging & Adult Development of the Association for Research, Administration, Professional Councils & Societies and the American Alliance for Health, Physical Education, Recreation and Dance, 1990. Publication of surgeon general's report on physical activity and health. *MMWR Morb Mortal Wkly Rep* 1996 Jul 12 45 591-592
59. Lombard and Ditton (1997) At the Heart of It All: The Concept of Presence. *Journal of Computer-Mediated Communication* 3(2).
60. Lord Susan E, Weatherall M, Rochester L, Community Ambulation in Older Adults: Which Internal Characteristics Are Important?, *Arch Phys Med Rehabil*. 2010 Mar;91(3):378-83.
61. Macchi C, Cecchi F. Attività Motoria dell'adulto e dell'anziano. Firenze: Polistampa, 2002.
62. Maki B, Holliday P, Topper A, A perspective study of postural balance and risk of falling in an ambulatory and independent elderly population. *Journal of Gerontology* 49, M72—M84, 1994.
63. McArdle W, Katch FI, Katch VL. *Exercise physiology – Energy, Nutrition and Human Performance*, Fourth edition. Baltimore: Williams and Wilkins, 1996.
64. Medved V, Measurement of human locomotion,Crc Press LLC: U.S.A. 2001
65. Morganti F., Riva G.(2006). Conoscenza, comunicazione e tecnologia. Ledonline.;
66. Munro J, Brazier J, Davey R, Nicholl J. Physical activity for the over 65s: could it be a cost-effective exercise for the NHS? *J Public Health Med* 1997; 19: 397-402.

67. Paffenbarger RS Jr, Hyde RT, Wing AL, Hsieh CC. Physical activity, all-cause mortality, and longevity of college alumni. *N Engl J Med* 1986; 314 (10) :605-13.
68. U.S. Department of Health and Human Services. *Physical Activity and Health: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996.
69. Fox KR. The Influence of physical activity on mental well-being. *Public Health Nutr*. 1999, 2 (3A):411-8.
70. Weyerer S, Kupfer B. Physical Exercise and Psychological Health. *Sports Med* 1994; 17(2) :108-16.
71. Thayer RE. *The biopsychology of mood and arousal*. New York: Oxford University Press, 1989.
72. BS Hale, KR Koch, JS Raglin. State anxiety responses to 60 Minutes of cross training. *Br J Sports Med* 2002; 36 (2) :105-7.
73. Taylor CB, Sallis JF, Needle R. The relation of physical activity and exercise to mental health. *Public Health Rep*. 1985; 100 (2) :195-202.
74. Teske JA, Billington CJ, Kotz CM. Neuropeptidergic Mediators of Spontaneous Physical Activity and non-exercise activity thermogenesis .. *Neuroendocrinology*. 2008, 87 (2):71-90.
75. Thompson D, Batterham AM, Bock S, Robson C, Stokes K. Assessment of low-to moderate-intensity physical activity thermogenesis in young adults using synchronized heart rate and accelerometry with branched-equation modeling. *J Nutr*. 2006 APR 136 (4) :1037-42.
76. Erlichman J, Kerbey AL, James WP. Physical Activity and Its Impact on health outcomes. Paper 1: The Impact of physical activity on cardiovascular disease and all-cause mortality: an historical perspective. *Obes Rev*. 2002.
77. Guyton Hornsby W Brynar RW. Clinical Exercise Psychology. In. Brown SP (ed.). *Introduction to Exercise Science*. Lippincott, Williams and Wilkins, Baltimore 2001.
78. Paffenbarger RS Jr, Kampert JB, Lee IM, Hyde RT, Leung RW, Wing AL. Changes in physical activity and other life way patterns influencing longevity. *Med Sci Sports Exerc* 1994; 26: 857-865.
79. Paffenbarger RS Jr, Lee IM. Intensity of physical activity related to incidence of hypertension and all-cause mortality: an epidemiological view. *Blood Press Monit* 1997; 2: 115-123.
80. Pale RR, Pratt M, Blair SN, et al. Physical activity and public health. A recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *JAMA* 1995; 273:402-7.
81. Pan XR, Li GW et al.: Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The Da Qing IGT and diabetes Study. *Diabetes Care* 20: 537-544, 1997.

82. Pischeddu T, et al. General and abdominal adiposity and risk of death in Europe. *N Engl J Med* 2008; 359: 2105-20
83. Pollock M L, Gaesser G A, Butcher J D. The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness, and flexibility in healthy adults. *Med Sci Sports Exerc* 1998; 30:975-991.
84. Puglisi F, Biomeccanica introduzione alle misure strumentali di postura e movimento, Marrapese editore: Roma 2007.
85. Puglisi F, Biomeccanica introduzione alle misure strumentali di postura e movimento, Marrapese editore: Roma 2007.
86. Pyykkö I, Aalto H, Hytonen M, Starck J, Jantti P, Ramsay H.(1988). Effect of age on postural control. In: Amblard B, Berthoz A, Clarac F.(Eds), Proceedings of the ninth International Symposium on postural and gait research, International Congress series 812, Posture and Gait: development, Adaptation and Modulation. ExcerptaMedica, Marseille, France, Amsterdam, New York, Oxford, pp 95-104.);
87. Rocchi L, Chiari L, Horak FB, The effect of DBS and Levodopa on postural sway in subjects with Parkinson's Disease, *Journal of Neurology Neurosurgery & Psychiatry*, 73 2002.
88. Romero-Corral A, et al. Association of body weight with total mortality and with cardiovascular events in coronary artery disease: a systematic review of cohort studies. *Lancet* 2006; 368: 666-78
89. Sesso HD, Paffenbarger RS, Lee IM. Physical activity and coronary heart disease in men: the Harvard Alumni Health Study. *Circulation* 2000; 102: 975.
90. Sheridan T.B. (1992). Musings on telepresence and virtual presence. *Presence: Teleoperators and Virtual Environments*, 1(1), 120-126;
91. Snowling NJ, Hopkins WJ. Effects of different modes of exercise training on glucose control and risk factors for complications in type 2 diabetic patients: a meta-analysis. *Diabetes Care* 29: 2518-2527, 2006.
92. Steuer J.(1992) Defining virtual reality: Dimensions determining telepresence. *Journal of Communication*, 42(4), 73-93;
93. Strawbridge WJ, Deleger S, Roberts RE, Kaplan GA. Physical activity reduces the risk of subsequent depression for older adults. *Am J Epidemiol* 2002; 156: 328-334.
94. Streepey JW, Kenyon RV, Keshner EA. (2006). Field of view and base of support width influence postural responses to visual stimuli during quiet stance. *Gait Posture*, 25(1):49-55.
95. Stringer WW, Hansen JE, Wasserman K. Cardiac output estimated non-invasively from oxygen uptake during exercise. *J Appl Physiol* 1997; 82: 908-912.
96. Sveistrup H.(2004). Motor rehabilitation using virtual reality. *Journal of NeuroEngineering and Rehabilitation*, pp.1-8;
97. Taguchi K, Relationship between head's and the body's center of gravity during normal standing, in *Acta Otolaryngol*, 1980;90(1-2):100-5.

- 98.** Taylor RS, Brown A, Ebrahim S, Jolliffe J, Noorani H, Rees K, et al. Exercise-based rehabilitation for patients with coronary artery disease: systematic review and metaanalysis of randomized controlled trials. *Am J Med* 2004; 116: 682-692.
- 99.** The diabetes prevention program research group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 346: 393-403, 2002.
- Tuomilehto J, Lindstrom J et al.: Prevention of type 2 diabetes by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med* 344: 1343-1350, 2001.
- 100.** Tuomiletho J, Lindstrom J, Eriksson JG, Valle TT, Hamalainen H, Ilanne-Parikka P, et al. The Finnish diabetes prevention study group. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med* 2001; 344: 1343-1350.
- 101.** Urbinati S, Fattorioli F, Tramarin R, Chieffo C, Temporelli PL, Griffi R, et al. Gruppo Italiano di Cardiologia Riabilitativa e Preventiva. The ISYDE project. A survey on Cardiac Rehabilitation in Italy. *Monaldi Arch Chest Dis* 2003; 60: 16-24.
- 102.** Virk et all. (2006). Virtual Reality Applications in Improving Postural Control and Minimizing Falls. Proceedings of the 28th IEEE EMBS Annual International Conference New York City, USA.
- 103.** Vona M, Rossi A, Capodaglio P. Impact of physical training and detraining on endothelium-dependent vasodilation in patients with recent myocardial infarction. *Am Heart J* 2004; 147: 1039-1046.
- 104.** Wang Y, Rimm EB, Stampfer MJ, Willett WC, Hu FB. Comparison of abdominal adiposity and overall obesity in predicting risk of type 2 diabetes among men. *Am J Clin Nutr* 2005; 81: 555-63
- 105.** Wannamethee GS, Lowe GD, Whincup PH, Rumley A, Walker M, Lennon L. Physical activity and hemostatic and inflammatory variables in elderly men. *Circulation* 2002; 105: 1785.
- 106.** Wasserman K, Hansen JE, Darryl YS, William WS, Brian JW. Principles of exercise testing and interpretation: including pathophysiology and clinical applications. Fourth Edition. Lippincott Williams & Wilkins Editors.
- 107.** Wasserman K, Zhang Y, Gitt A, Belardinelli R, Koike A, Lubarsky L, et al. Lung function and exercise gas exchange in chronic heart failure. *Circulation* 1997; 96: 2221-2227.
- 108.** Weber KT, Janicki JS. Cardiopulmonary exercise testing for evaluation of chronic cardiac failure. *Am J Cardiol* 1985; 55: 22A-31A.
- 109.** Wei M, Gibbons LW et al. Low cardiorespiratory fitness and physical inactivity as predictors of mortality in men with type 2 diabetes. *Ann Intern Med* 132: 605-611, 2000.
- 110.** Whit F, Rafique G: Diabetes prevalenceand projections in south Asia. *Lancet* 360: 804-805, 2002.

- 111.** Wild S, Roglic G et al.: Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care* 27: 1047-1053, 2004.
- 112.** Winstein C J. (1991). Knowledge of the results and motor learning: implications for physical therapy. *Physical therapy*, 71:140-149;
- 113.** Winter D, Human balance and posture control during standing and walking, *Gait & Posture* 3, 1995.
- 114.** World Health Organization. The World Health Report 2002: reducing risk, promoting healthy life.
- 115.** Yusuf S, Hawken S, Ounpuu S, Bautista L, Franzosi MG, Commerford P, Lang CC, Rumboldt Z, Onen CL, Lisheng L, Tanomsup S, Wangai P Jr, Razak F, Sharma AM, Anand SS. Interheart Study Investigators. Obesity and the risk of myocardial infarction in 27.000 participants from 52 countries: a case-control study. *Lancet* 2005; 366: 1640-9
- 116.** Zinman B, Ruderman N et al. American Diabetes Association. Physical activity/exercise and diabetes. *Diabetes Care* 27 (suppl I): s58-s62, 2004.