

Testosterone therapy in men: 312 placebo-controlled studies – 303 in adults

Healthy adults

Healthy young men

1. Dreher JC, Dunne S, Pazderska A, Frodl T, Nolan JJ, O'Doherty JP. Testosterone causes both prosocial and antisocial status-enhancing behaviors in human males. *Proc Natl Acad Sci U S A*. 2016 Oct 11;113(41):11633-11638
2. Carré JM, Geniole SN, Ortiz TL, Bird BM, Videto A, Bonin PL. Exogenous testosterone rapidly increases aggressive behavior in dominant and impulsive men. *Biol Psychiatry*. 2016 Jun 16. pii: S0006-3223(16)32475-1
3. Welling LL, Moreau BJ, Bird BM, Hansen S, Carré JM. Exogenous testosterone increases men's perceptions of their own physical dominance. *Psychoneuroendocrinology*. 2016 Feb;64:136-42
4. Carré JM, Ortiz TL, Labine B, Moreau BJ, Viding E, Neumann CS, Goldfarb B. Digit ratio (2D:4D) and psychopathic traits moderate the effect of exogenous testosterone on socio-cognitive processes in men. *Psychoneuroendocrinology*. 2015 Dec;62:319-26
5. Ortner GR, Wibrall M, Becker A, Dohmen T, Klingmüller D, Falk A, Weber B. No evidence for an effect of testosterone administration on delay discounting in male university students. *Psychoneuroendocrinology*. 2013 Sep;38(9):1814-8.
6. Wibrall M, Dohmen T, Klingmüller D, Weber B, Falk A. Testosterone administration reduces lying in men. *PLoS One*. 2012;7(10):e46774.
7. Eisenegger C, von Eckardstein A, Fehr E, von Eckardstein S. Pharmacokinetics of testosterone and estradiol gel preparations in healthy young men. *Psychoneuroendocrinology*. 2013 Feb;38(2):171-8.
8. Wright ND, Edwards T, Fleming SM, Dolan RJ. Testosterone induces off-line perceptual learning. *Psychopharmacology (Berl)*. 2012 Dec;224(3):451-7.
9. Zak PJ, Kurzban R, Ahmadi S, Swerdloff RS, Park J, Efremidze L, Redwine K, Morgan K, Matzner W. Testosterone administration decreases generosity in the ultimatum game. *PLoS One*. 2009 Dec 16;4(12):e8330.
10. Nelson AE, Meinhardt U, Hansen JL, Walker IH, Stone G, Howe CJ, Leung KC, Seibel MJ, Baxter RC, Handelsman DJ, Kazlauskas R, Ho KK. Pharmacodynamics of growth hormone abuse biomarkers and the influence of gender and testosterone: a randomized double-blind placebo-controlled study in young recreational athletes. *J Clin Endocrinol Metab*. 2008 Jun;93(6):2213-22.
11. Rogerson S, Weatherby RP, Deakin GB, Meir RA, Coutts RA, Zhou S, Marshall-Gradisnik SM. The effect of short-term use of testosterone enanthate on muscular strength and power in healthy young men. *J Strength Cond Res*. 2007 May;21(2):354-61.
12. Chung T, Kelleher S, Liu PY, Conway AJ, Kritharides L, Handelsman DJ. Effects of testosterone and nandrolone on cardiac function: a randomized, placebo-controlled study. *Clin Endocrinol (Oxf)*. 2007 Feb;66(2):235-45.
13. Chik Z, Johnston A, Tucker AT, Chew SL, Michaels L, Alam CA. Pharmacokinetics of a new testosterone transdermal delivery system, TDS-testosterone in healthy males. *Br J Clin Pharmacol*. 2006 Mar;61(3):275-9.
14. O'Connor DB, Archer J, Wu FC. Effects of testosterone on mood, aggression, and sexual behavior in young men: a double-blind, placebo-controlled, cross-over study. *J Clin Endocrinol Metab*. 2004 Jun;89(6):2837-45.
15. Veldhuis JD, Evans WS, Iranmanesh A, Weltman AL, Bowers CY. Short-term testosterone supplementation relieves growth hormone autonegative feedback in men. *J Clin Endocrinol Metab*. 2004 Mar;89(3):1285-90.
16. Giorgi A, Weatherby RP, Murphy PW. Muscular strength, body composition and health responses to the use of testosterone enanthate: a double blind study. *J Sci Med Sport*. 1999 Dec;2(4):341-55.
17. Pope HG Jr, Kouri EM, Hudson JI. Effects of supraphysiologic doses of testosterone on mood and aggression in normal men: a randomized controlled trial. *Arch Gen Psychiatry*. 2000 Feb;57(2):133-40; discussion 155-6.
18. Zhang GY, Gu YQ, Wang XH, Cui YG, Bremner WJ. A clinical trial of injectable testosterone undecanoate as a potential male contraceptive in normal Chinese men. *J Clin Endocrinol Metab*. 1999 Oct;84(10):3642-7.
19. White CM, Ferraro-Borgida MJ, Moyna NM, McGill CC, Ahlberg AW, Thompson PD, Heller GV. The effect of pharmacokinetically guided acute intravenous testosterone administration on electrocardiographic and blood pressure variables. *J Clin Pharmacol*. 1999 Oct;39(10):1038-43.
20. Brisson GR, Gutiérrez Sáinz A, Ayotte C, Gareau R, Sénécal L, Castillo MJ. Influence of a transscrotal testosterone propionate administration on the serum level of selected hormones of the hypophyso-gonadal axis. *J Steroid Biochem Mol Biol*. 1997 May;62(1):65-71.
21. Perry PJ, MacIndoe JH, Yates WR, Scott SD, Holman TL. Detection of anabolic steroid administration: ratio of urinary testosterone to epitestosterone vs the ratio of urinary testosterone to luteinizing hormone. *Clin Chem*. 1997 May;43(5):731-5.
22. Brisson GR, Gutiérrez Sáinz A, Ayotte C, Gareau R, Sénécal L, Castillo MJ. Frequent serum sampling in healthy men discloses testosterone peaks exacerbated by testosterone propionate administration. *Can J Appl Physiol*. 1997 Feb;22(1):58-65.
23. Ajayi AA, Mathur R, Halushka PV. Testosterone increases human platelet thromboxane A2 receptor density and aggregation responses. *Circulation*. 1995 Jun 1;91(11):2742-7.

REFERENCES preceded by « 2/ »

Healthy young men using testosterone for contraception (or sport abuse)

24. Fingerhood MI, Sullivan JT, Testa M, Jasinski DR. Abuse liability of testosterone. *J Psychopharmacol* 1997;11(1):59-63.
25. Pelusi C, Costantino A, Cerpolini S, Pelusi G, Meriggiola MC, Pasquali R. A placebo-controlled, randomized clinical trial using testosterone undecanoate with injectable norethisterone enanthate: effect on anthropometric, metabolic and biochemical parameters. *Int J Androl*. 2011 Dec;34(6 Pt 1):548-55.
26. Rudolph I, Ernst M, Kirsch B, Martorana G, Pelusi G. Norethisterone enanthate plus testosterone undecanoate for male contraception: effects of various injection intervals on spermatogenesis, reproductive hormones, testis, and prostate. *J Clin Endocrinol Metab*. 2005 Apr;90(4):2005-14.
27. Herbst KL, Anawalt BD, Amory JK, Matsumoto AM, Bremner WJ. The male contraceptive regimen of testosterone and levonorgestrel significantly increases lean mass in healthy young men in 4 weeks, but attenuates a decrease in fat mass induced by testosterone alone. *J Clin Endocrinol Metab*. 2003 Mar;88(3):1167-73.
28. Amory JK, Anawalt BD, Bremner WJ, Matsumoto AM. Daily testosterone and gonadotropin levels are similar in azoospermic and nonazoospermic normal men administered weekly testosterone: implications for male contraceptive development. *J Androl*. 2001 Nov-Dec;22(6):1053-60.
29. Blazeovich AJ, Giorgi A. Effect of testosterone administration and weight training on muscle architecture. *Med Sci Sports Exerc*. 2001 Oct;33(10):1688-93.
30. Kamischke A, Plöger D, Venherm S, von Eckardstein S, von Eckardstein A, Nieschlag E. Intramuscular testosterone undecanoate with or without oral levonorgestrel: a randomized placebo-controlled feasibility study for male contraception. *Clin Endocrinol (Oxf)*. 2000 Jul;53(1):43-52. Erratum in: *Clin Endocrinol (Oxf)* 2000 Nov;53(5):661.
31. MacIndoe JH, Perry PJ, Yates WR, Holman TL, Ellingrod VL, Scott SD. Testosterone suppression of the HPT axis. *J Investig Med*. 1997 Oct;45(8):441-7.
32. Tricker R, Casaburi R, Storer TW, Clevenger B, Berman N, Shirazi A, Bhasin S. The effects of supraphysiological doses of testosterone on angry behavior in healthy eugonadal men--a clinical research center study. *J Clin Endocrinol Metab*. 1996 Oct;81(10):3754-8.
33. Bhasin S, Storer TW, Berman N, Callegari C, Clevenger B, Phillips J, Bunnell TJ, Tricker R, Shirazi A, Casaburi R. The effects of supraphysiologic doses of testosterone on muscle size and strength in normal men. *N Engl J Med*. 1996 Jul 4;335(1):1-7.
34. Kouri EM, Pope HG Jr, Oliva PS. Changes in lipoprotein-lipid levels in normal men following administration of increasing doses of testosterone cypionate. *Clin J Sport Med*. 1996 Jul;6(3):152-7.
35. Anderson RA, Bancroft J, Wu FC. The effects of exogenous testosterone on sexuality and mood of normal men. *J Clin Endocrinol Metab*. 1992 Dec;75(6):1503-7.
36. Carani C, Scuteri A, Marrama P, Bancroft J. The effects of testosterone administration and visual erotic stimuli on nocturnal penile tumescence in normal men. *Horm Behav*. 1990 Sep;24(3):435-41.
37. Matsumoto AM. Effects of chronic testosterone administration in normal men: safety and efficacy of high dosage testosterone and parallel dose-dependent suppression of luteinizing hormone, follicle-stimulating hormone, and sperm production. *J Clin Endocrinol Metab*. 1990 Jan;70(1):282-7.
38. Matsumoto AM. Is high dosage testosterone an effective male contraceptive agent? *Fertil Steril*. 1988 Aug;50(2):324-8

Healthy young men chemically castrated receiving testosterone

39. Bird BM, Welling LL, Ortiz TL, Moreau BJ, Hansen S, Emond M, Goldfarb B, Bonin PL, Carré JM. Effects of exogenous testosterone and mating context on men's preferences for female facial femininity. *Horm Behav*. 2016 Sep;85:76-85
40. Taylor AP, Lee H, Webb ML, Joffe H, Finkelstein JS. Effects of testosterone and estradiol deficiency on vasomotor symptoms in hypogonadal men. *J Clin Endocrinol Metab*. 2016 Sep;101(9):3479-86
41. Thirumalai A, Cooper LA, Rubinow KB, Amory JK, Lin DW, Wright JL, Marck BT, Matsumoto AM, Page ST. Stable intraprostatic dihydrotestosterone in healthy medically castrate men treated with exogenous testosterone. *J Clin Endocrinol Metab*. 2016 Jul;101(7):2937-44
42. Høst C, Gormsen LC, Hougaard DM, Christiansen JS, Pedersen SB, Gravholt CH. Acute and short-term chronic testosterone fluctuation effects on glucose homeostasis, insulin sensitivity, and adiponectin: a randomized, double-blind, placebo-controlled, crossover study. *J Clin Endocrinol Metab*. 2014 Jun;99(6):E1088-96
43. Høst C, Gormsen LC, Christensen B, Jessen N, Hougaard DM, Christiansen JS, Pedersen SB, Jensen MD, Nielsen S, Gravholt CH. Independent effects of testosterone on lipid oxidation and VLDL-TG production: a randomized, double-blind, placebo-controlled, crossover study. *Diabetes*. 2013 May;62(5):1409-16

REFERENCES preceded by « 2/ »

44. Pedersen SB, Jensen MD, Nielsen S, Gravholt CH. Independent effects of testosterone on lipid oxidation and VLDL-TG production: a randomized, double-blind, placebo-controlled, crossover study. *Diabetes*. 2013 May;62(5):1409-16
45. Rubinow KB, Snyder CN, Amory JK, Hoofnagle AN, Page ST. Acute testosterone deprivation reduces insulin sensitivity in men. *Clin Endocrinol (Oxf)*. 2012 Feb;76(2):281-8.
46. Page ST, Plymate SR, Bremner WJ, Matsumoto AM, Hess DL, Lin DW, Amory JK, Nelson PS, Wu JD. Effect of medical castration on CD4+ CD25+ T cells, CD8+ T cell IFN-gamma expression, and NK cells: a physiological role for testosterone and/or its metabolites. *Am J Physiol Endocrinol Metab*. 2006 May;290(5):E856-63.
47. Yates WR, Perry PJ, MacIndoe J, Holman T, Ellingrod V. Psychosexual effects of three doses of testosterone cycling in normal men. *Biol Psychiatry*. 1999 Feb 1;45(3):254-60. Zachwieja JJ, Smith SR, Lovejoy JC, Rood JC, Windhauser MM, Bray GA. Testosterone administration preserves protein balance but not muscle strength during 28 days of bed rest. *J Clin Endocrinol Metab*. 1999 Jan;84(1):207-12
48. Kouri EM, Lukas SE, Pope HG Jr, Oliva PS. Increased aggressive responding in male volunteers following the administration of gradually increasing doses of testosterone cypionate. *Drug Alcohol Depend*. 1995 Nov;40(1):73-9. Erratum in: 1998 May 1;50(3):255.
49. Bagatell CJ, Heiman JR, Rivier JE, Bremner WJ. Effects of endogenous testosterone and estradiol on sexual behavior in normal young men. *J Clin Endocrinol Metab*. 1994 Mar;78(3):711-6.
50. Bagatell CJ, Knopp RH, Vale WW, Rivier JE, Bremner WJ. Physiologic testosterone levels in normal men suppress high-density lipoprotein cholesterol levels. *Ann Intern Med*. 1992 Jun 15;116(12 Pt 1):967-73
51. Chik Z, Johnston A, Tucker AT, Kirby K, Alam CA. Correcting endogenous concentrations of testosterone influences bioequivalence and shows the superiority of TDS(R)-testosterone versus Androgel(R). *Int J Clin Pharmacol Ther*. 2009 Apr;47(4):262-8.
52. Veldhuis JD, Anderson SM, Iranmanesh A, Bowers CY. Testosterone blunts feedback inhibition of growth hormone secretion by experimentally elevated insulin-like growth factor-I concentrations. *J Clin Endocrinol Metab*. 2005 Mar;90(3):1613-7.
53. Reddy P, White CM, Dunn AB, Moyna NM, Thompson PD. The effect of testosterone on health-related quality of life in elderly males - a pilot study. *J Clin Pharm Ther*. 2000 Dec;25(6):421-6.
54. Snyder PJ, Peachey H, Hannoush P, Berlin JA, Loh L, Lenrow DA, Holmes JH, Dlewati A, Santanna J, Rosen CJ, Strom BL. Effect of testosterone treatment on body composition and muscle strength in men over 65 years of age. *J Clin Endocrinol Metab*. 1999 Aug;84(8):2647-53.

Healthy middle-age men

55. Holmång S, Mårin P, Lindstedt G, Hedelin H. Effect of long-term oral testosterone undecanoate treatment on prostate volume and serum prostate-specific antigen concentration in eugonadal middle-aged men. *Prostate*. 1993;23(2):99-106

Healthy elderly men

56. Muniyappa R, Veldhuis JD, Harman SM, Sorkin JD, Blackman MR. Effects of testosterone administration on nocturnal cortisol secretion in healthy older men. *J Gerontol A Biol Sci Med Sci*. 2010 Nov;65(11):1185-92.
57. Veldhuis JD, Keenan DM, Bailey JN, Adeniji A, Miles JM, Paulo R, Cosma M, Soares-Welch C. Testosterone supplementation in older men restrains insulin-like growth factor's dose-dependent feedback inhibition of pulsatile growth hormone secretion. *J Clin Endocrinol Metab*. 2009 Jan;94(1):246-54.
58. Maki PM, Ernst M, London ED, Mordecai KL, Perschler P, Durso SC, Brandt J, Dobs A, Resnick SM. Intramuscular testosterone treatment in elderly men: evidence of memory decline and altered brain function. *J Clin Endocrinol Metab*. 2007 Nov;92(11):4107-14.
59. Cherrier MM, Matsumoto AM, Amory JK, Johnson M, Craft S, Peskind ER, Raskind MA. Characterization of verbal and spatial memory changes from moderate to supraphysiological increases in serum testosterone in healthy older men. *Psychoneuroendocrinology*. 2007 Jan;32(1):72-9.
60. Giannoulis MG, Jackson N, Shojaee-Moradie F, Sonksen PH, Martin FC, Umpleby AM. Effects of growth hormone and/or testosterone on very low density lipoprotein apolipoprotein B100 kinetics and plasma lipids in healthy elderly men: a randomised controlled trial. *Growth Horm IGF Res*. 2006 Oct-Dec;16(5-6):308-17.
61. Muniyappa R, Wong KA, Baldwin HL, Sorkin JD, Johnson ML, Bhasin S, Harman SM, Blackman MR. Dehydroepiandrosterone secretion in healthy older men and women: effects of testosterone and growth hormone administration in older men. *J Clin Endocrinol Metab*. 2006 Nov;91(11):4445-52.
62. Giannoulis MG, Sonksen PH, Umpleby M, Breen L, Pentecost C, Whyte M, McMillan CV, Bradley C, Martin FC. The effects of growth hormone and/or testosterone in healthy elderly men: a randomized controlled trial. *J Clin Endocrinol Metab*. 2006 Feb;91(2):477-84.
63. Cherrier MM, Matsumoto AM, Amory JK, Ahmed S, Bremner W, Peskind ER, Raskind MA, Johnson M, Craft S. The role of aromatization in testosterone supplementation: effects on cognition in older men. *Neurology*. 2005 Jan 25;64(2):290-6.

REFERENCES preceded by « 2/ »

64. Cherrier MM, Plymate S, Mohan S, Asthana S, Matsumoto AM, Bremner W, Peskind E, Raskind M, Latendresse S, Haley AP, Craft S. Relationship between testosterone supplementation and insulin-like growth factor-I levels and cognition in healthy older men. *Psychoneuroendocrinology*. 2004 Jan;29(1):65-82.
65. Liu PY, Yee B, Wishart SM, Jimenez M, Jung DG, Grunstein RR, Handelsman DJ. The short-term effects of high-dose testosterone on sleep, breathing, and function in older men. *J Clin Endocrinol Metab*. 2003 Aug;88(8):3605-13.
66. Lambert CP, Sullivan DH, Evans WJ. Effects of testosterone replacement and/or resistance training on interleukin-6, tumor necrosis factor alpha, and leptin in elderly men ingesting megestrol acetate: a randomized controlled trial. *J Gerontol A Biol Sci Med Sci*. 2003 Feb;58(2):165-70.
67. Ferrando AA, Sheffield-Moore M, Paddon-Jones D, Wolfe RR, Urban RJ. Differential anabolic effects of testosterone and amino acid feeding in older men. *J Clin Endocrinol Metab*. 2003 Jan;88(1):358-62.
68. Lambert CP, Sullivan DH, Freeling SA, Lindquist DM, Evans WJ. Effects of testosterone replacement and/or resistance exercise on the composition of megestrol acetate stimulated weight gain in elderly men: a randomized controlled trial. *J Clin Endocrinol Metab*. 2002 May;87(5):2100-6.
69. Snyder PJ, Peachey H, Berlin JA, Rader D, Usher D, Loh L, Hannoush P, Dlewati A, Holmes JH, Santanna J, Strom BL. Effect of transdermal testosterone treatment on serum lipid and apolipoprotein levels in men more than 65 years of age. *Am J Med*. 2001 Sep;111(4):255-60.
70. Cherrier MM, Asthana S, Plymate S, Baker L, Matsumoto AM, Peskind E, Raskind MA, Brodtkin K, Bremner W, Petrova A, LaTendresse S, Craft S. Testosterone supplementation improves spatial and verbal memory in healthy older men. *Neurology*. 2001 Jul 10;57(1):80-8.
71. Uyanik BS, Ari Z, Gümüs B, Yiğitoğlu MR, Arslan T. Beneficial effects of testosterone undecanoate on the lipoprotein profiles in healthy elderly men. A placebo controlled study. *Jpn Heart J*. 1997 Jan;38(1):73-82.

Healthy elderly men chemically castrated receiving testosterone

72. Storer TW, Woodhouse L, Magliano L, Singh AB, Dzekov C, Dzekov J, Bhasin S. Changes in muscle mass, muscle strength, and power but not physical function are related to testosterone dose in healthy older men. *J Am Geriatr Soc*. 2008 Nov;56(11):1991-9.
73. Veldhuis JD, Keenan DM, Mielke K, Miles JM, Bowers CY. Testosterone supplementation in healthy older men drives GH and IGF-I secretion without potentiating peptidyl secretagogue efficacy. *Eur J Endocrinol*. 2005 Oct;153(4):577-86

Healthy' middle-aged men \geq age 40 with testosterone deficiency, serum testosterone level below the lower reference limit

74. Tong SF, Ng CJ, Lee BC, Lee VK, Khoo EM, Lee EG, Tan HM. Effect of long-acting testosterone undecanoate treatment on quality of life in men with testosterone deficiency syndrome: a double blind randomized controlled trial. *Asian J Androl*. 2012 Jul;14(4):604-11.
75. Ho CC, Tong SF, Low WY, Ng CJ, Khoo EM, Lee VK, Zainuddin ZM, Tan HM. A randomized, double-blind, placebo-controlled trial on the effect of long-acting testosterone treatment as assessed by the Aging Male Symptoms scale. *BJU Int*. 2012 Jul;110(2):260-5.

Elderly men with serum testosterone levels near or below the lower reference limit of young men

76. Dias JP, Shardell MD, Carlson OD, Melvin D, Caturegli G, Ferrucci L, Chia CW, Egan JM, Basaria S. Testosterone vs. aromatase inhibitor in older men with low testosterone: effects on cardiometabolic parameters. *Andrology*. 2016 Oct 28. . [Epub ahead of print]
77. Storer TW, Basaria S, Traustadottir T, Harman SM, Pencina K, Li Z, Travison TG, Miciek R, Tsitouras P, Hally K, Huang G, Bhasin S. Effects of Testosterone Supplementation for 3-Years on Muscle Performance and Physical Function in Older Men. *J Clin Endocrinol Metab*. 2016 Oct 18;jc20162771. [Epub ahead of print]
78. Brock G, Heiselman D, Knorr J, Ni X, Kinchen K. 9-month efficacy and safety study of testosterone solution 2% for sex drive and energy in hypogonadal men. *J Urol*. 2016 Nov;196(5):1509-1515.
79. Huang G, Wharton W, Bhasin S, Harman SM, Pencina KM, Tsitouras P, Li Z, Hally KA, Asthana S, Storer TW, Basaria S. Effects of long-term testosterone administration on cognition in older men with low or low-to-normal testosterone concentrations: a prespecified secondary analysis of data from the randomised, double-blind, placebo-controlled TEAAM trial. *Lancet Diabetes Endocrinol*. 2016 Aug;4(8):657-65.
80. Cunningham GR, Stephens-Shields AJ, Rosen RC, Wang C, Bhasin S, Matsumoto AM, Parsons JK, Gill TM, Molitch ME, Farrar JT, Cella D, Barrett-Connor E, Cauley JA, Cifelli D, Crandall JP, Ensrud KE, Gallagher L, Zeldow B, Lewis CE, Pahor M, Swerdloff RS, Hou X, Anton S, Basaria S, Diem SJ, Tabatabaie V, Ellenberg SS, Snyder PJ. Testosterone treatment and sexual function in older men with low testosterone levels. *J Clin Endocrinol Metab*. 2016 Aug;101(8):3096-104
81. Wu F, Zitzmann M, Heiselman D, Donatucci C, Knorr J, Patel AB, Kinchen K. Demographic and clinical correlates of patient-reported improvement in sex drive, erectile function, and energy with testosterone solution 2. *J Sex Med*. 2016 Aug;13(8):1212-9

REFERENCES preceded by « 2/ »

82. Storer TW, Bhasin S, Travison TG, Pencina K, Miciek R, McKinnon J, Basaria S. Testosterone attenuates age-related fall in aerobic function in mobility limited older men with low testosterone. *J Clin Endocrinol Metab.* 2016 Jun;101(6):2562-9
83. Snyder PJ, Bhasin S, Cunningham GR, Matsumoto AM, Stephens-Shields AJ, Cauley JA, Gill TM, Barrett-Connor E, Swerdloff RS, Wang C, Ensrud KE, Lewis CE, Farrar JT, Cella D, Rosen RC, Pahor M, Crandall JP, Molitch ME, Cifelli D, Dougar D, Fluharty L, Resnick SM, Storer TW, Anton S, Basaria S, Diem SJ, Hou X, Mohler ER 3rd, Parsons JK, Wenger NK, Zeldow B, Landis JR, Ellenberg SS; Testosterone Trials Investigators.. Effects of Testosterone Treatment in Older Men. *N Engl J Med.* 2016 Feb 18;374(7):611-24
84. Rogol AD, Tkachenko N, Bryson N. Natesto™, a novel testosterone nasal gel, normalizes androgen levels in hypogonadal men. *Andrology.* 2016 Jan;4(1):46-54
85. Dias JP, Melvin D, Simonsick EM, Carlson O, Shardell MD, Ferrucci L, Chia CW, Basaria S, Egan JM. Effects of aromatase inhibition vs. testosterone in older men with low testosterone: randomized-controlled trial. *Andrology.* 2016 Jan;4(1):33-40
86. Glinborg D, Christensen LL, Kvorning T, Larsen R, Højlund K, Brixen K, Hougaard DM, Handberg A, Andersen M. Differential effects of strength training and testosterone treatment on soluble CD36 in aging men: Possible relation to changes in body composition. *Scand J Clin Lab Invest.* 2015;75(8):659-66
87. Swerdloff RS, Pak Y, Wang C, Liu PY, Bhasin S, Gill TM, Matsumoto AM, Pahor M, Surampudi P, Snyder PJ. Serum testosterone (t) level variability in t gel-treated older hypogonadal men: treatment monitoring implications. *J Clin Endocrinol Metab.* 2015 Sep;100(9):3280-7.
88. Meuleman EJ, Legros JJ, Bouloux PM, Johnson-Levonos AO, Kaspers MJ, Elbers JM, Geurts TB, Meehan AG; Study 43203 Investigators.. Effects of long-term oral testosterone undecanoate therapy on urinary symptoms: data from a 1-year, placebo-controlled, dose-ranging trial in aging men with symptomatic hypogonadism. *Aging Male.* 2015;18(3):157-63.
89. Fitts RH, Peters JR, Dillon EL, Durham WJ, Sheffield-Moore M, Urban RJ. Weekly versus monthly testosterone administration on fast and slow skeletal muscle fibers in older adult males. *J Clin Endocrinol Metab.* 2015 Feb;100(2):E223-31.
90. Borst SE, Yarrow JF, Fernandez C, Conover CF, Ye F, Meuleman JR, Morrow M, Zou B, Shuster JJ. Cognitive effects of testosterone and finasteride administration in older hypogonadal men. *Clin Interv Aging.* 2014 Aug 12;9:1327-33
91. Maggio M, Snyder PJ, De Vita F, Ceda GP, Milaneschi Y, Lauretani F, Luci M, Cattabiani C, Peachey H, Valenti G, Cappola AR, Longo DL, Ferrucci L. Effects of transdermal testosterone treatment on inflammatory markers in elderly males. *Endocr Pract.* 2014 Nov;20(11):1170-7
92. Beggs LA, Yarrow JF, Conover CF, Meuleman JR, Beck DT, Morrow M, Zou B, Shuster JJ, Borst SE. Testosterone alters iron metabolism and stimulates red blood cell production independently of dihydrotestosterone. *Am J Physiol Endocrinol Metab.* 2014 Sep 1;307(5):E456-61.
93. Petersson SJ, Christensen LL, Kristensen JM, Kruse R, Andersen M, Højlund K. Effect of testosterone on markers of mitochondrial oxidative phosphorylation and lipid metabolism in muscle of aging men with subnormal bioavailable testosterone. *Eur J Endocrinol.* 2014 Jul;171(1):77-88.
94. Borst SE, Yarrow JF, Conover CF, Nseyo U, Meuleman JR, Lipinska JA, Braith RW, Beck DT, Martin JS, Morrow M, Roessner S, Beggs LA, McCoy SC, Cannady DF 2nd, Shuster JJ. Musculoskeletal and prostate effects of combined testosterone and finasteride administration in older hypogonadal men: a randomized, controlled trial. *Am J Physiol Endocrinol Metab.* 2014 Feb 15;306(4):E433-42
95. Glinborg D, Christensen LL, Kvorning T, Larsen R, Brixen K, Hougaard DM, Richelsen B, Bruun JM, Andersen M. Strength training and testosterone treatment have opposing effects on migration inhibitor factor levels in ageing men. *Mediators Inflamm.* 2013;2013:539156.
96. Kvorning T, Christensen LL, Madsen K, Nielsen JL, Gejl KD, Brixen K, Andersen M. Mechanical muscle function and lean body mass during supervised strength training and testosterone therapy in aging men with low-normal testosterone levels. *J Am Geriatr Soc.* 2013 Jun;61(6):957-62.
97. Tan WS, Low WY, Ng CJ, Tan WK, Tong SF, Ho C, Khoo EM, Lee G, Lee BC, Lee V, Tan HM. Efficacy and safety of long-acting intramuscular testosterone undecanoate in aging men: a randomised controlled study. *BJU Int.* 2013 Jun;111(7):1130-40.
98. Bouloux PM, Legros JJ, Elbers JM, Geurts TB, Kaspers MJ, Meehan AG, Meuleman EJ; Study 43203 Investigators.. Effects of oral testosterone undecanoate therapy on bone mineral density and body composition in 322 aging men with symptomatic testosterone deficiency: a 1-year, randomized, placebo-controlled, dose-ranging study. *Aging Male.* 2013 Jun;16(2):38-47
99. Hildreth KL, Barry DW, Moreau KL, Vande Griend J, Meacham RB, Nakamura T, Wolfe P, Kohrt WM, Ruscin JM, Kittelson J, Cress ME, Ballard R, Schwartz RS. Effects of testosterone and progressive resistance exercise in healthy, highly functioning older men with low-normal testosterone levels. *J Clin Endocrinol Metab.* 2013 May;98(5):1891-900. (
100. Maggio M, Snyder PJ, Ceda GP, Milaneschi Y, Luci M, Cattabiani C, Masoni S, Vignali A, Volpi R, Lauretani F, Peachey H, Valenti G, Cappola AR, Longo D, Ferrucci L. Is the haematopoietic effect of testosterone mediated by erythropoietin? The results of a clinical trial in older men. *Andrology.* 2013 Jan;1(1):24-8.

REFERENCES preceded by « 2/ »

101. Frederiksen L, Glinborg D, Højlund K, Hougaard DM, Brixen K, Rasmussen LM, Andersen M. Osteoprotegerin levels decrease during testosterone therapy in aging men and are associated with changed distribution of regional fat. *Horm Metab Res.* 2013 Apr;45(4):308-13.
102. Andersen M. Testosterone therapy decreases subcutaneous fat and adiponectin in aging men. *Eur J Endocrinol.* 2012 Mar;166(3):469-76.
103. Sheffield-Moore M, Dillon EL, Casperson SL, Gilkison CR, Paddon-Jones D, Durham WJ, Grady JJ, Urban RJ. A randomized pilot study of monthly cycled testosterone replacement or continuous testosterone replacement versus placebo in older men. *J Clin Endocrinol Metab.* 2011 Nov;96(11):E1831-7.
104. Chen F, Lam R, Shaywitz D, Hendrickson RC, Opitck GJ, Wishengrad D, Liaw A, Song Q, Stewart AJ, Cummings CE, Beals C, Yarasheski KE, Reicin A, Ruddy M, Hu X, Yates NA, Menetski J, Herman GA. Evaluation of early biomarkers of muscle anabolic response to testosterone. *J Cachexia Sarcopenia Muscle.* 2011 Mar;2(1):45-56 (study 1)
105. Frederiksen L, Højlund K, Hougaard DM, Brixen K, Andersen M. Testosterone therapy increased muscle mass and lipid oxidation in aging men. *Age (Dordr).* 2012 Feb;34(1):145-56.
106. Emmelot-Vonk MH, Verhaar HJ, Nakhai-Pour HR, Grobbee DE, van der Schouw YT. Low testosterone concentrations and the symptoms of testosterone deficiency according to the Androgen Deficiency in Ageing Males (ADAM) and Ageing Males' Symptoms rating scale (AMS) questionnaires. *Clin Endocrinol (Oxf).* 2011 Apr;74(4):488-94.
107. Atkinson RA, Srinivas-Shankar U, Roberts SA, Connolly MJ, Adams JE, Oldham JA, Wu FC, Seynnes OR, Stewart CE, Maganaris CN, Narici MV. Effects of testosterone on skeletal muscle architecture in intermediate-frail and frail elderly men. *J Gerontol A Biol Sci Med Sci.* 2010 Nov;65(11):1215-9.
108. Srinivas-Shankar U, Roberts SA, Connolly MJ, O'Connell MD, Adams JE, Oldham JA, Wu FC. Effects of testosterone on muscle strength, physical function, body composition, and quality of life in intermediate-frail and frail elderly men: a randomized, double-blind, placebo-controlled study. *J Clin Endocrinol Metab.* 2010 Feb;95(2):639-50.
109. Agledahl I, Brodin E, Svartberg J, Hansen JB. Impact of long-term testosterone treatment on plasma levels of free TFPI and TF-induced thrombin generation ex vivo in elderly men with low testosterone levels. *Thromb Haemost.* 2009 Nov;102(5):945-50.
110. Koutsari C, Ali AH, Nair KS, Rizza RA, O'Brien P, Khosla S, Jensen MD. Fatty acid metabolism in the elderly: effects of dehydroepiandrosterone and testosterone replacement in hormonally deficient men and women. *J Clin Endocrinol Metab.* 2009 Sep;94(9):3414-23.
111. Emmelot-Vonk MH, Verhaar HJ, Nakhai-Pour HR, Grobbee DE, van der Schouw YT. Effect of testosterone supplementation on sexual functioning in aging men: a 6-month randomized controlled trial. *Int J Impot Res.* 2009 Mar-Apr;21(2):129-38.
112. Legros JJ, Meuleman EJ, Elbers JM, Geurts TB, Kaspers MJ, Bouloux PM; Study 43203 Investigators.. Oral testosterone replacement in symptomatic late-onset hypogonadism: effects on rating scales and general safety in a randomized, placebo-controlled study. *Eur J Endocrinol.* 2009 May;160(5):821-31.
113. Basurto L, Zarate A, Gomez R, Vargas C, Saucedo R, Galván R. Effect of testosterone therapy on lumbar spine and hip mineral density in elderly men. *Aging Male.* 2008 Sep;11(3):140-5.
114. Allan CA, Forbes EA, Strauss BJ, McLachlan RI. Testosterone therapy increases sexual desire in ageing men with low-normal testosterone levels and symptoms of androgen deficiency. *Int J Impot Res.* 2008 Jul-Aug;20(4):396-401.
115. Giannoulis MG, Jackson N, Shojaee-Moradie F, Nair KS, Sonksen PH, Martin FC, Umpleby AM. The effects of growth hormone and/or testosterone on whole body protein kinetics and skeletal muscle gene expression in healthy elderly men: a randomized controlled trial. *J Clin Endocrinol Metab.* 2008 Aug;93(8):3066-74.
116. Emmelot-Vonk MH, Verhaar HJ, Nakhai Pour HR, Aleman A, Lock TM, Bosch JL, Grobbee DE, van der Schouw YT. Effect of testosterone supplementation on functional mobility, cognition, and other parameters in older men: a randomized controlled trial. *JAMA.* 2008 Jan 2;299(1):39-52. Erratum in: *JAMA.* 2008 Feb 13;299(6):634.
117. Agledahl I, Hansen JB, Svartberg J. Impact of testosterone treatment on postprandial triglyceride metabolism in elderly men with subnormal testosterone levels. *Scand J Clin Lab Invest.* 2008;68(7):641-8.
118. Nakhai-Pour HR, Grobbee DE, Emmelot-Vonk MH, Bots ML, Verhaar HJ, van der Schouw YT. Oral testosterone supplementation and chronic low-grade inflammation in elderly men: a 26-week randomized, placebo-controlled trial. *Am Heart J.* 2007 Dec;154(6):1228.e1-7.
119. Allan CA, Strauss BJ, Burger HG, Forbes EA, McLachlan RI. Testosterone therapy prevents gain in visceral adipose tissue and loss of skeletal muscle in nonobese aging men. *J Clin Endocrinol Metab.* 2008 Jan;93(1):139-46.
120. Vaughan C, Goldstein FC, Tenover JL. Exogenous testosterone alone or with finasteride does not improve measurements of cognition in healthy older men with low serum testosterone. *J Androl.* 2007 Nov-Dec;28(6):875-82. Wesley Woods Health Center, Atlanta, GA 30329, USA
121. Muniyappa R, Sorkin JD, Veldhuis JD, Harman SM, Münzer T, Bhasin S, Blackman MR. Long-term testosterone supplementation augments overnight growth hormone secretion in healthy older men. *Am J Physiol Endocrinol Metab.* 2007 Sep;293(3):E769-75.

REFERENCES preceded by « 2/ »

122. Basu R, Dalla Man C, Campioni M, Basu A, Nair KS, Jensen MD, Khosla S, Klee G, Toffolo G, Cobelli C, Rizza RA. Effect of 2 years of testosterone replacement on insulin secretion, insulin action, glucose effectiveness, hepatic insulin clearance, and postprandial glucose turnover in elderly men. *Diabetes Care*. 2007 Aug;30(8):1972-8.
123. Katznelson L, Robinson MW, Coyle CL, Lee H, Farrell CE. Effects of modest testosterone supplementation and exercise for 12 weeks on body composition and quality of life in elderly men. *Eur J Endocrinol*. 2006 Dec;155(6):867-75.
124. Marks LS, Mazer NA, Mostaghel E, Hess DL, Dorey FJ, Epstein JI, Veltri RW, Makarov DV, Partin AW, Bostwick DG, Macairan ML, Nelson PS. Effect of testosterone replacement therapy on prostate tissue in men with late-onset hypogonadism: a randomized controlled trial. *JAMA*. 2006 Nov 15;296(19):2351-61.
125. Nair KS, Rizza RA, O'Brien P, Dhatariya K, Short KR, Nehra A, Vittone JL, Klee GG, Basu A, Basu R, Cobelli C, Toffolo G, Dalla Man C, Tindall DJ, Melton LJ 3rd, Smith GE, Khosla S, Jensen MD. DHEA in elderly women and DHEA or testosterone in elderly men. *N Engl J Med*. 2006 Oct 19;355(16):1647-59
126. Sullivan DH, Roberson PK, Johnson LE, Bishara O, Evans WJ, Smith ES, Price JA. Effects of muscle strength training and testosterone in frail elderly males. *Med Sci Sports Exerc*. 2005 Oct;37(10):1664-72.
127. Haren MT, Wittert GA, Chapman IM, Coates P, Morley JE. Effect of oral testosterone undecanoate on visuospatial cognition, mood and quality of life in elderly men with low-normal gonadal status. *Maturitas*. 2005 Feb 14;50(2):124-33.
128. Haren M, Chapman I, Coates P, Morley J, Wittert G. Effect of 12 month oral testosterone on testosterone deficiency symptoms in symptomatic elderly males with low-normal gonadal status. *Age Ageing*. 2005 Mar;34(2):125-30.
129. Page ST, Amory JK, Bowman FD, Anawalt BD, Matsumoto AM, Bremner WJ, Tenover JL. Exogenous testosterone (T) alone or with finasteride increases physical performance, grip strength, and lean body mass in older men with low serum T. *J Clin Endocrinol Metab*. 2005 Mar;90(3):1502-10.
130. Amory JK, Watts NB, Easley KA, Sutton PR, Anawalt BD, Matsumoto AM, Bremner WJ, Tenover JL. Exogenous testosterone or testosterone with finasteride increases bone mineral density in older men with low serum testosterone. *J Clin Endocrinol Metab*. 2004 Feb;89(2):503-10.
131. Wittert GA, Chapman IM, Haren MT, Mackintosh S, Coates P, Morley JE. Oral testosterone supplementation increases muscle and decreases fat mass in healthy elderly males with low-normal gonadal status. *J Gerontol A Biol Sci Med Sci*. 2003 Jul;58(7):618-25.
132. Steidle C, Schwartz S, Jacoby K, Sebree T, Smith T, Bachand R; North American AA2500 T Gel Study Group.. AA2500 testosterone gel normalizes androgen levels in aging males with improvements in body composition and sexual function. *J Clin Endocrinol Metab*. 2003 Jun;88(6):2673-81.
133. Kenny AM, Prestwood KM, Gruman CA, Fabregas G, Biskup B, Mansoor G. Effects of transdermal testosterone on lipids and vascular reactivity in older men with low bioavailable testosterone levels. *J Gerontol A Biol Sci Med Sci*. 2002 Jul;57(7):M460-5.
134. Ferrando AA, Sheffield-Moore M, Yeckel CW, Gilkison C, Jiang J, Achacosa A, Lieberman SA, Tipton K, Wolfe RR, Urban RJ. Testosterone administration to older men improves muscle function: molecular and physiological mechanisms. *Am J Physiol Endocrinol Metab*. 2002 Mar;282(3):E601-7.
135. Kenny AM, Prestwood KM, Gruman CA, Marcello KM, Raisz LG. Effects of transdermal testosterone on bone and muscle in older men with low bioavailable testosterone levels. *J Gerontol A Biol Sci Med Sci*. 2001 May;56(5):M266-72.
136. Clague JE, Wu FC, Horan MA. Difficulties in measuring the effect of testosterone replacement therapy on muscle function in older men. *Int J Androl*. 1999 Aug;22(4):261-5.
137. Snyder PJ, Peachey H, Hannoush P, Berlin JA, Loh L, Holmes JH, Dlewati A, Staley J, Santanna J, Kapoor SC, Attie MF, Haddad JG Jr, Strom BL. Effect of testosterone treatment on bone mineral density in men over 65 years of age. *J Clin Endocrinol Metab*. 1999 Jun;84(6):1966-72.
138. Morley JE, Kaiser FE, Perry HM 3rd, Patrick P, Ross C. Testosterone replacement in older hypogonadal men: a 12-month randomized controlled trial. *J Clin Endocrinol Metab*. 1997 Jun;82(6):1661-7.
139. Tenover JS. Effects of testosterone supplementation in the aging male. *J Clin Endocrinol Metab*. 1992 Oct;75(4):1092-8. PubMed PMID: 1400877.

Healthy adult men of all ages with testosterone deficiency, serum testosterone level below the lower reference limit

Testosterone deficiency in adult men of all ages

140. Cueva C, Roberts RE, Spencer TJ, Rani N, Tempest M, Tobler PN, Herbert J, Rustichini A. Testosterone administration does not affect men's rejections of low ultimatum game offers or aggressive mood. *Horm Behav*. 2016 Oct 3;87:1-7
141. Brock G, Heiselman D, Maggi M, Kim SW, Rodríguez Vallejo JM, Behre HM, McGettigan J, Dowsett SA, Hayes RP, Knorr J, Ni X, Kinchen K. Effect of testosterone solution 2% on testosterone concentration, sex drive and energy in hypogonadal men: results of a placebo controlled study. *J Urol*. 2016 Mar;195(3):699-705

REFERENCES preceded by « 2/ »

142. Francomano D, Fattorini G, Gianfrilli D, Paoli D, Sgrò P, Radicioni A, Romanelli F, Di Luigi L, Gandini L, Lenzi A, Aversa A. Acute endothelial response to testosterone gel administration in men with severe hypogonadism and its relationship to androgen receptor polymorphism: a pilot study. *J Endocrinol Invest.* 2016 Mar;39(3):265-71
143. Morgentaler A, Benesh JA, Denes BS, Kan-Dobrosky N, Harb D, Miller MG. Factors influencing prostate-specific antigen response among men treated with testosterone therapy for 6 months. *J Sex Med.* 2014 Nov;11(11):2818-25
144. Kaufman JM, Miller MG, Garwin JL, Fitzpatrick S, McWhirter C, Brennan JJ. Efficacy and safety study of 1.62% testosterone gel for the treatment of hypogonadal men. *J Sex Med.* 2011 Jul;8(7):2079-89.
145. Chen F, Lam R, Shaywitz D, Hendrickson RC, Opitck GJ, Wishengrad D, Liaw A, Song Q, Stewart AJ, Cummings CE, Beals C, Yarasheski KE, Reicin A, Ruddy M, Hu X, Yates NA, Menetski J, Herman GA. Evaluation of early biomarkers of muscle anabolic response to testosterone. *J Cachexia Sarcopenia Muscle.* 2011 Mar;2(1):45-56 (study 2)
146. Chiang HS, Hwang TI, Hsui YS, Lin YC, Chen HE, Chen GC, Liao CH. Transdermal testosterone gel increases serum testosterone levels in hypogonadal men in Taiwan with improvements in sexual function. *Int J Impot Res.* 2007 Jul-Aug;19(4):411-7.
147. Seftel AD, Mack RJ, Secrest AR, Smith TM. Restorative increases in serum testosterone levels are significantly correlated to improvements in sexual functioning. *J Androl.* 2004 Nov-Dec;25(6):963-72.
148. Malkin CJ, Pugh PJ, Jones RD, Kapoor D, Channer KS, Jones TH. The effect of testosterone replacement on endogenous inflammatory cytokines and lipid profiles in hypogonadal men. *J Clin Endocrinol Metab.* 2004 Jul;89(7):3313-8.
149. Park NC, Yan BQ, Chung JM, Lee KM. Oral testosterone undecanoate (Andriol) supplement therapy improves the quality of life for men with testosterone deficiency. *Aging Male.* 2003 Jun;6(2):86-93.
150. Lambert CP, Sullivan DH, Evans WJ. Megestrol acetate-induced weight gain does not negatively affect blood lipids in elderly men: effects of resistance training and testosterone replacement. *J Gerontol A Biol Sci Med Sci.* 2003 Jul;58(7):644-7.
151. Simon D, Charles MA, Lahlou N, Nahoul K, Oppert JM, Gouault-Heilmann M, Lemort N, Thibault N, Joubert E, Balkau B, Eschwege E. Androgen therapy improves insulin sensitivity and decreases leptin level in healthy adult men with low plasma total testosterone: a 3-month randomized placebo-controlled trial. *Diabetes Care.* 2001 Dec;24(12):2149-51.
152. Yu Z, Gupta SK, Hwang SS, Kipnes MS, Mooradian AD, Snyder PJ, Atkinson LE. Testosterone pharmacokinetics after application of an investigational transdermal system in hypogonadal men. *J Clin Pharmacol.* 1997 Dec;37(12):1139-45.
153. Dobs AS, Hoover DR, Chen MC, Allen R. Pharmacokinetic characteristics, efficacy, and safety of buccal testosterone in hypogonadal males: a pilot study. *J Clin Endocrinol Metab.* 1998 Jan;83(1):33-9.
154. Carani C, Celani MF, Zini D, Baldini A, Della Casa L, Marrama P. Changes in the bioactivity to immunoreactivity ratio of circulating luteinizing hormone in impotent men treated with testosterone undecanoate. *Acta Endocrinol (Copenh).* 1989 Mar;120(3):284-8.
155. Montgomery JC, Appleby L, Brincat M, Versi E, Tapp A, Fenwick PB, Studd JW. Effect of oestrogen and testosterone implants on psychological disorders in the climacteric. *Lancet.* 1987 Feb 7;1(8528):297-9
156. Skakkebaek NE, Bancroft J, Davidson DW, Warner P. Androgen replacement with oral testosterone undecanoate in hypogonadal men: a double blind controlled study. *Clin Endocrinol (Oxf).* 1981 Jan;14(1):49-6

Klinefelter syndrome

157. Bizzarro A, Valentini G, Di Martino G, DaPonte A, De Bellis A, Iacono G. Influence of testosterone therapy on clinical and immunological features of autoimmune diseases associated with Klinefelter's syndrome. *J Clin Endocrinol Metab.* 1987 Jan;64(1):32-6.
158. Wu FC, Bancroft J, Davidson DW, Nicol K. The behavioural effects of testosterone undecanoate in adult men with Klinefelter's syndrome: a controlled study. *Clin Endocrinol (Oxf).* 1982 May;16(5):489-97

Somatic diseases in adult men

Heart coronary artery disease

159. Basaria S, Harman SM, Travison TG, Hodis H, Tsitouras P, Budoff M, Pencina KM, Vita J, Dzekov C, Mazer NA, Coviello AD, Knapp PE, Hally K, Pinjic E, Yan M, Storer TW, Bhasin S. Effects of testosterone administration for 3 years on subclinical atherosclerosis progression in older men with low or low-normal testosterone levels: a randomized clinical trial. *JAMA.* 2015 Aug 11;314(6):570-81.
160. Mathur A, Malkin C, Saeed B, Muthusamy R, Jones TH, Channer K. Long-term benefits of testosterone replacement therapy on angina threshold and atheroma in men. *Eur J Endocrinol.* 2009 Sep;161(3):443-9. doi: 10.1530/EJE-09-0092. Erratum in: *Eur J Endocrinol.* 2009 Oct;161(4):653.
161. Royal Hallamshire Hospital, Sheffield S10 2JF, UK

REFERENCES preceded by « 2/ »

162. Cornoldi A, Caminiti G, Marazzi G, Vitale C, Patrizi R, Volterrani M, Miceli M, Fini M, Spera G, Rosano G. Effects of chronic testosterone administration on myocardial ischemia, lipid metabolism and insulin resistance in elderly male diabetic patients with coronary artery disease. *Int J Cardiol.* 2010 Jun 25;142(1):50-5.
163. Webb CM, Elkington AG, Kraidly MM, Keenan N, Pennell DJ, Collins P. Effects of oral testosterone treatment on myocardial perfusion and vascular function in men with low plasma testosterone and coronary heart disease. *Am J Cardiol.* 2008 Mar 1;101(5):618-24.
164. Smith AM, English KM, Malkin CJ, Jones RD, Jones TH, Channer KS. Testosterone does not adversely affect fibrinogen or tissue plasminogen activator (tPA) and plasminogen activator inhibitor-1 (PAI-1) levels in 46 men with chronic stable angina. *Eur J Endocrinol.* 2005 Feb;152(2):285-91.
165. Malkin CJ, Pugh PJ, Morris PD, Kerry KE, Jones RD, Jones TH, Channer KS. Testosterone replacement in hypogonadal men with angina improves ischaemic threshold and quality of life. *Heart.* 2004 Aug;90(8):871-6.
166. Thompson PD, Ahlberg AW, Moyna NM, Duncan B, Ferraro-Borgida M, White CM, McGill CC, Heller GV. Effect of intravenous testosterone on myocardial ischemia in men with coronary artery disease. *Am Heart J.* 2002 Feb;143(2):249-56.
167. Romanò M. [Low-dose transdermal testosterone therapy improves angina threshold in men with chronic stable angina. A randomized, double-blind, placebo-controlled study]. *Ital Heart J Suppl.* 2001 Feb;2(2):203-4.
168. English KM, Steeds RP, Jones TH, Diver MJ, Channer KS. Low-dose transdermal testosterone therapy improves angina threshold in men with chronic stable angina: A randomized, double-blind, placebo-controlled study. *Circulation.* 2000 Oct 17;102(16):1906-11.
169. Rosano GM, Leonardo F, Pagnotta P, Pelliccia F, Panina G, Cerquetani E, della Monica PL, Bonfigli B, Volpe M, Chierchia SL. Acute anti-ischemic effect of testosterone in men with coronary artery disease. *Circulation.* 1999 Apr 6;99(13):1666-70. Erratum in: *Circulation* 2000 Feb 8;101(5):584.
170. Webb CM, Adamson DL, de Zeigler D, Collins P. Effect of acute testosterone on myocardial ischemia in men with coronary artery disease. *Am J Cardiol.* 1999 Feb 1;83(3):437-9, A9.
171. Jaffe MD. Effect of testosterone cypionate on postexercise ST segment depression. *Br Heart J.* 1977 Nov;39(11):1217-22

Heart failure

172. Mirdamadi A, Garakyaraghi M, Pourmoghaddas A, Bahmani A, Mahmoudi H, Gharipour M. Beneficial effects of testosterone therapy on functional capacity, cardiovascular parameters, and quality of life in patients with congestive heart failure. *Biomed Res Int.* 2014;2014:392432
173. Stout M, Tew GA, Doll H, Zwierska I, Woodroffe N, Channer KS, Saxton JM. Testosterone therapy during exercise rehabilitation in male patients with chronic heart failure who have low testosterone status: a double-blind randomized controlled feasibility study. *Am Heart J.* 2012 Dec;164(6):893-901
174. Schwartz JB, Volterrani M, Caminiti G, Marazzi G, Fini M, Rosano GM, Iellamo F. Effects of testosterone on the Q-T interval in older men and older women with chronic heart failure. *Int J Androl.* 2011 Oct;34(5 Pt 2):e415-21.
175. Caminiti G, Volterrani M, Iellamo F, Marazzi G, Massaro R, Miceli M, Mammi C, Piepoli M, Fini M, Rosano GM. Effect of long-acting testosterone treatment on functional exercise capacity, skeletal muscle performance, insulin resistance, and baroreflex sensitivity in elderly patients with chronic heart failure a double-blind, placebo-controlled, randomized study. *J Am Coll Cardiol.* 2009 Sep 1;54(10):919-27.
176. Malkin CJ, Jones TH, Channer KS. The effect of testosterone on insulin sensitivity in men with heart failure. *Eur J Heart Fail.* 2007 Jan;9(1):44-50.
177. Pugh PJ, Jones RD, Malkin CJ, Hall J, Nettleship JE, Kerry KE, Jones TH, Channer KS. Physiologic testosterone therapy has no effect on serum levels of tumour necrosis factor-alpha in men with chronic heart failure. *Endocr Res.* 2005;31(4):271-83.
178. Malkin CJ, Pugh PJ, West JN, van Beek EJ, Jones TH, Channer KS. Testosterone therapy in men with moderate severity heart failure: a double-blind randomized placebo controlled trial. *Eur Heart J.* 2006 Jan;27(1):57-64.
179. Pugh PJ, Jones TH, Channer KS. Acute haemodynamic effects of testosterone in men with chronic heart failure. *Eur Heart J.* 2003 May;24(10):909-15.

Chronic obstructive pulmonary disease

180. Chavoshan B, Fournier M, Lewis MI, Porszasz J, Storer TW, Da X, Rambod M, Casaburi R. Testosterone and resistance training effects on muscle nitric oxide synthase isoforms in COPD men. *Respir Med.* 2012 Feb;106(2):269-75.
181. Lewis MI, Fournier M, Storer TW, Bhasin S, Porszasz J, Ren SG, Da X, Casaburi R. Skeletal muscle adaptations to testosterone and resistance training in men with COPD. *J Appl Physiol (1985).* 2007 Oct;103(4):1299-310.
182. Svartberg J, Aasebø U, Hjalmsen A, Sundsfjord J, Jorde R. Testosterone treatment improves body composition and sexual function in men with COPD, in a 6-month randomized controlled trial. *Respir Med.* 2004 Sep;98(9):906-13.

REFERENCES preceded by « 2/ »

183. Casaburi R, Bhasin S, Cosentino L, Porszasz J, Somfay A, Lewis MI, Fournier M, Storer TW. Effects of testosterone and resistance training in men with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med.* 2004 Oct 15;170(8):870-8

Sleep apnea

184. Melehan KL, Hoyos CM, Yee BJ, Wong KK, Buchanan PR, Grunstein RR, Liu PY. Increased sexual desire with exogenous testosterone administration in men with obstructive sleep apnea: a randomized placebo-controlled study. *Andrology.* 2016 Jan;4(1):55-61.
185. Killick R, Wang D, Hoyos CM, Yee BJ, Grunstein RR, Liu PY. The effects of testosterone on ventilatory responses in men with obstructive sleep apnea: a randomised, placebo-controlled trial. *J Sleep Res.* 2013 Jun;22(3):331-6.
186. Hoyos CM, Yee BJ, Phillips CL, Machan EA, Grunstein RR, Liu PY. Body compositional and cardiometabolic effects of testosterone therapy in obese men with severe obstructive sleep apnoea: a randomised placebo-controlled trial. *Eur J Endocrinol.* 2012 Oct;167(4):531-41.
187. Hoyos CM, Killick R, Yee BJ, Grunstein RR, Liu PY. Effects of testosterone therapy on sleep and breathing in obese men with severe obstructive sleep apnoea: a randomized placebo-controlled trial. *Clin Endocrinol (Oxf).* 2012 Oct;77(4):599-607

Liver disease - alcoholic cirrhosis

188. Sinclair M, Grossmann M, Hoermann R, Angus PW, Gow PJ. Testosterone therapy increases muscle mass in men with cirrhosis and low testosterone: A randomized controlled trial. *J Hepatol.* 2016 Nov;65(5):906-913
189. Gluud C, Wantzin P, Eriksen J. No effect of oral testosterone treatment on sexual dysfunction in alcoholic cirrhotic men. *Gastroenterology.* 1988 Dec;95(6):1582-7.
190. Becker U, Gluud C, Bennett P. The effect of oral testosterone on serum TBG levels in alcoholic cirrhotic men. *Liver.* 1988 Aug;8(4):219-24.
191. Gluud C, Bennett P, Svenstrup B, Micic S. Effect of oral testosterone treatment on serum concentrations of sex steroids gonadotrophins and prolactin in alcoholic cirrhotic men. *Copenhagen Study Group for Liver Diseases. Aliment Pharmacol Ther.* 1988 Apr;2(2):119-28.
192. Gluud C, Christoffersen P, Eriksen J, Wantzin P, Knudsen BB. No effect of long-term oral testosterone treatment on liver morphology in men with alcoholic cirrhosis. *Am J Gastroenterol.* 1987 Jul;82(7):660-4
193. Gluud C, Henriksen JH. Liver haemodynamics and function in alcoholic cirrhosis. Relation to testosterone treatment and ethanol consumption. *J Hepatol.* 1987 Apr;4(2):168-73.
194. Testosterone treatment of men with alcoholic cirrhosis: a double-blind study. The Copenhagen Study Group for Liver Diseases. *Hepatology.* 1986 Sep-Oct;6(5):807-13.

Kidney failure/hemodialysis

195. van Coevorden A, Stolear JC, Dhaene M, van Herweghem JL, Mockel J. Effect of chronic oral testosterone undecanoate administration on the pituitary-testicular axes of hemodialyzed male patients. *Clin Nephrol.* 1986 Jul;26(1):48-54

Rheumatoid arthritis

196. Hall GM, Larbre JP, Spector TD, Perry LA, Da Silva JA. A randomized trial of testosterone therapy in males with rheumatoid arthritis. *Br J Rheumatol.* 1996 Jun;35(6):568-73.

Osteopenia, osteoporosis

197. Wang YJ, Zhan JK, Huang W, Wang Y, Liu Y, Wang S, Tan P, Tang ZY, Liu YS. Effects of low-dose testosterone undecanoate treatment on bone mineral density and bone turnover markers in elderly male osteoporosis with low serum testosterone. *Int J Endocrinol.* 2013;2013:570413. .
198. Kenny AM, Kleppinger A, Annis K, Rathier M, Browner B, Judge JO, McGee D. Effects of transdermal testosterone on bone and muscle in older men with low bioavailable testosterone levels, low bone mass, and physical frailty. *J Am Geriatr Soc.* 2010 Jun;58(6):1134-43.

Obesity

199. Ng Tang Fui M, Prendergast LA, Dupuis P, Raval M, Strauss BJ, Zajac JD, Grossmann M. Effects of testosterone treatment on body fat and lean mass in obese men on a hypocaloric diet: a randomised controlled trial. *BMC Med.* 2016 Oct 7;14(1):153.
200. Mårin P. Testosterone and regional fat distribution. *Obes Res.* 1995 Nov;3 Suppl 4:609S-612S.
201. Mårin P, Holmäng S, Jönsson L, Sjöström L, Kvist H, Holm G, Lindstedt G, Björntorp P. The effects of testosterone treatment on body composition and metabolism in middle-aged obese men. *Int J Obes Relat Metab Disord.* 1992 Dec;16(12):991-7.

REFERENCES preceded by « 2/ »

202. Juang PS, Peng S, Allehmazdeh K, Shah A, Coviello AD, Herbst KL. Testosterone with dutasteride, but not anastrozole, improves insulin sensitivity in young obese men: a randomized controlled trial. *J Sex Med.* 2014 Feb;11(2):563-73

Type 1 diabetes

203. Chillarón JJ, Fernández-Miró M, Albareda M, Fontserè S, Colom C, Vila L, Pedro-Botet J, Flores Le-Roux JA. Testosterone undecanoate improves lipid profile in patients with type 1 diabetes and hypogonadotropic hypogonadism. *Endocr J.* 2016 Sep 30;63(9):849-855

Type 2 diabetes

204. Dhindsa S, Ghanim H, Batra M, Kuhadiya ND, Abuaysheh S, Green K, Makdissi A, Chaudhuri A, Dandona P. Effect of testosterone on hepcidin, ferroportin, ferritin and iron binding capacity in patients with hypogonadotropic hypogonadism and type 2 diabetes. *Clin Endocrinol (Oxf).* 2016 Nov;85(5):772-780. (
205. Magnussen LV, Grintborg D, Hermann P, Hougaard DM, Højlund K, Andersen M. Effect of testosterone on insulin sensitivity, oxidative metabolism and body composition in aging men with type 2 diabetes on metformin monotherapy. *Diabetes Obes Metab.* 2016 Oct;18(10):980-9.
206. Hackett G, Cole N, Bhartia M, Kennedy D, Raju J, Wilkinson P; BLAST Study Group.. Testosterone replacement therapy improves metabolic parameters in hypogonadal men with type 2 diabetes but not in men with coexisting depression: the BLAST study. *J Sex Med.* 2014 Mar;11(3):840-56.
207. Stanworth RD, Akhtar S, Channer KS, Jones TH. The role of androgen receptor CAG repeat polymorphism and other factors which affect the clinical response to testosterone replacement in metabolic syndrome and type 2 diabetes: TIMES2 sub-study. *Eur J Endocrinol.* 2013 Dec 21;170(2):193-200.
208. Gopal RA, Bothra N, Acharya SV, Ganesh HK, Bandgar TR, Menon PS, Shah NS. Treatment of hypogonadism with testosterone in patients with type 2 diabetes mellitus. *Endocr Pract.* 2010 Jul-Aug;16(4):570-6.
209. Hackett G, Cole N, Saghir A, Jones P, Strange RC, Ramachandran S. Testosterone undecanoate improves sexual function in men with type 2 diabetes and severe hypogonadism: results from a 30-week randomized placebo-controlled study. *BJU Int.* 2016 Nov;118(5):804-813.
210. Dhindsa S, Ghanim H, Batra M, Kuhadiya ND, Abuaysheh S, Sandhu S, Green K, Makdissi A, Hejna J, Chaudhuri A, Punyanitya M, Dandona P. Insulin resistance and inflammation in hypogonadotropic hypogonadism and their reduction after testosterone replacement in men with type 2 diabetes. *Diabetes Care.* 2016 Jan;39(1):82-91.
211. Gianatti EJ, Hoermann R, Lam Q, Dupuis P, Zajac JD, Grossmann M. Effect of testosterone treatment on cardiac biomarkers in a randomized controlled trial of men with type 2 diabetes. *Clin Endocrinol (Oxf).* 2016 Jan;84(1):55-62.
212. Janjgava S, Zerekidze T, Uchava L, Giorgadze E, Asatiani K. Influence of testosterone replacement therapy on metabolic disorders in male patients with type 2 diabetes mellitus and androgen deficiency. *Eur J Med Res.* 2014 Oct 23;19:56
213. Gianatti EJ, Dupuis P, Hoermann R, Zajac JD, Grossmann M. Effect of testosterone treatment on constitutional and sexual symptoms in men with type 2 diabetes in a randomized, placebo-controlled clinical trial. *J Clin Endocrinol Metab.* 2014 Oct;99(10):3821-8
214. Gianatti EJ, Dupuis P, Hoermann R, Strauss BJ, Wentworth JM, Zajac JD, Grossmann M. Effect of testosterone treatment on glucose metabolism in men with type 2 diabetes: a randomized controlled trial. *Diabetes Care.* 2014 Aug;37(8):2098-107
215. Hackett G, Cole N, Bhartia M, Kennedy D, Raju J, Wilkinson P, Saghir A; Blast Study Group.. The response to testosterone undecanoate in men with type 2 diabetes is dependent on achieving threshold serum levels (the BLAST study). *Int J Clin Pract.* 2014 Feb;68(2):203-15.
216. Hackett G, Cole N, Bhartia M, Kennedy D, Raju J, Wilkinson P. Testosterone replacement therapy with long-acting testosterone undecanoate improves sexual function and quality-of-life parameters vs. placebo in a population of men with type 2 diabetes. *J Sex Med.* 2013 Jun;10(6):1612-27.
217. Kapoor D, Clarke S, Stanworth R, Channer KS, Jones TH. The effect of testosterone replacement therapy on adipocytokines and C-reactive protein in hypogonadal men with type 2 diabetes. *Eur J Endocrinol.* 2007 May;156(5):595-602.
218. Kapoor D, Goodwin E, Channer KS, Jones TH. Testosterone replacement therapy improves insulin resistance, glycaemic control, visceral adiposity and hypercholesterolaemia in hypogonadal men with type 2 diabetes. *Eur J Endocrinol.* 2006 Jun;154(6):899-906. Road, Barnsley S75 2EP, UK

Type 2 diabetes and metabolic syndrome

219. Jones TH, Arver S, Behre HM, Buvat J, Meuleman E, Moncada I, Morales AM, Volterrani M, Yellowlees A, Howell JD, Channer KS; TIMES2 Investigators.. Testosterone replacement in hypogonadal men with type 2 diabetes and/or metabolic syndrome (the TIMES2 study). *Diabetes Care.* 2011 Apr;34(4):828-37.

Metabolic syndrome

REFERENCES preceded by « 2/ »

220. Kalinchenko SY, Tishova YA, Mskhalaya GJ, Gooren LJ, Giltay EJ, Saad F. Effects of testosterone supplementation on markers of the metabolic syndrome and inflammation in hypogonadal men with the metabolic syndrome: the double-blinded placebo-controlled Moscow study. *Clin Endocrinol (Oxf)*. 2010 Nov;73(5):602-12.
221. Aversa A, Bruzziches R, Francomano D, Rosano G, Isidori AM, Lenzi A, Spera G. Effects of testosterone undecanoate on cardiovascular risk factors and atherosclerosis in middle-aged men with late-onset hypogonadism and metabolic syndrome: results from a 24-month, randomized, double-blind, placebo-controlled study. *J Sex Med*. 2010 Oct;7(10):3495-503.
222. Giltay EJ, Tishova YA, Mskhalaya GJ, Gooren LJ, Saad F, Kalinchenko SY. Effects of testosterone supplementation on depressive symptoms and sexual dysfunction in hypogonadal men with the metabolic syndrome. *J Sex Med*. 2010 Jul;7(7):2572-82.
223. Aversa A, Bruzziches R, Francomano D, Spera G, Lenzi A. Efficacy and safety of two different testosterone undecanoate formulations in hypogonadal men with metabolic syndrome. *J Endocrinol Invest*. 2010 Dec;33(11):776-83.

Malnourishment in elderly men

224. Visvanathan R, Piantadosi C, Lange K, Naganathan V, Hunter P, Cameron ID, Chapman I. The Randomized Control Trial of the Effects of Testosterone and a Nutritional Supplement On Hospital Admissions in Undernourished, Community Dwelling, Older People. *J Nutr Health Aging*. 2016;20(7):769-79.

Reduced mobility in elderly men

225. Bachman E, Travison TG, Basaria S, Davda MN, Guo W, Li M, Connor Westfall J, Bae H, Gordeuk V, Bhasin S. Testosterone induces erythrocytosis via increased erythropoietin and suppressed hepcidin: evidence for a new erythropoietin/hemoglobin set point. *J Gerontol A Biol Sci Med Sci*. 2014 Jun;69(6):725-35
226. Huang G, Bhasin S, Tang ER, Aakil A, Anderson SW, Jara H, Davda M, Travison TG, Basaria S. Effect of testosterone administration on liver fat in older men with mobility limitation: results from a randomized controlled trial. *J Gerontol A Biol Sci Med Sci*. 2013 Aug;68(8):954-9
227. Basaria S, Davda MN, Travison TG, Ulloor J, Singh R, Bhasin S. Risk factors associated with cardiovascular events during testosterone administration in older men with mobility limitation. *J Gerontol A Biol Sci Med Sci*. 2013 Feb;68(2):153-60.
228. Travison TG, Basaria S, Storer TW, Jette AM, Miciek R, Farwell WR, Choong K, Lakshman K, Mazer NA, Coviello AD, Knapp PE, Ulloor J, Zhang A, Brooks B, Nguyen AH, Eder R, LeBrasseur N, Elmi A, Appleman E, Hede-Brierley L, Bhasin G, Bhatia A, Lazzari A, Davis S, Ni P, Collins L, Bhasin S. Clinical meaningfulness of the changes in muscle performance and physical function associated with testosterone administration in older men with mobility limitation. *J Gerontol A Biol Sci Med Sci*. 2011 Oct;66(10):1090-9.
229. Basaria S, Coviello AD, Travison TG, Storer TW, Farwell WR, Jette AM, Eder R, Tennstedt S, Ulloor J, Zhang A, Choong K, Lakshman KM, Mazer NA, Miciek R, Krasnoff J, Elmi A, Knapp PE, Brooks B, Appleman E, Aggarwal S, Bhasin G, Hede-Brierley L, Bhatia A, Collins L, LeBrasseur N, Fiore LD, Bhasin S. Adverse events associated with testosterone administration. *N Engl J Med*. 2010 Jul 8;363(2):109-22. Boston University, Boston, Massachusetts 02118, USA

Ill elderly men

230. Bakhshi V, Elliott M, Gentili A, Godschalk M, Mulligan T. Testosterone improves rehabilitation outcomes in ill older men. *J Am Geriatr Soc*. 2000 May;48(5):550-3. PubMed PMID: 10811549.

Surgery- pain

231. Huang G, Travison TG, Edwards RR, Basaria S. Effects of testosterone replacement on pain catastrophizing and sleep quality in men with opioid-induced androgen deficiency. *Pain Med*. 2016 Aug 22. pii: pnw159. [Epub ahead of print]

Surgery - recovery

232. Amory JK, Chansky HA, Chansky KL, Camuso MR, Hoey CT, Anawalt BD, Matsumoto AM, Bremner WJ. Preoperative supraphysiological testosterone in older men undergoing knee replacement surgery. *J Am Geriatr Soc*. 2002 Oct;50(10):1698-701.

HIV/AIDS

233. Sardar P, Jha A, Roy D, Majumdar U, Guha P, Roy S, Banerjee R, Banerjee AK, Bandyopadhyay D. Therapeutic effects of nandrolone and testosterone in adult male HIV patients with AIDS wasting syndrome (AWS): a randomized, double-blind, placebo-controlled trial. *HIV Clin Trials*. 2010 Jul-Aug;11(4):220-9.
234. Knapp PE, Storer TW, Herbst KL, Singh AB, Dzekov C, Dzekov J, LaValley M, Zhang A, Ulloor J, Bhasin S. Effects of a supraphysiological dose of testosterone on physical function, muscle performance, mood, and fatigue in men with HIV-associated weight loss. *Am J Physiol Endocrinol Metab*. 2008 Jun;294(6):E1135-43.

REFERENCES preceded by « 2/ »

235. Montano M, Flanagan JN, Jiang L, Sebastiani P, Rarick M, LeBrasseur NK, Morris CA, Jasuja R, Bhasin S. Transcriptional profiling of testosterone-regulated genes in the skeletal muscle of human immunodeficiency virus-infected men experiencing weight loss. *J Clin Endocrinol Metab.* 2007 Jul;92(7):2793-802.
236. Bhasin S, Parker RA, Sattler F, Haubrich R, Alston B, Umbleja T, Shikuma CM; AIDS Clinical Trials Group Protocol A5079 Study Team.. Effects of testosterone supplementation on whole body and regional fat mass and distribution in human immunodeficiency virus-infected men with abdominal obesity. *J Clin Endocrinol Metab.* 2007 Mar;92(3):1049-57.
237. Kvorning T, Andersen M, Brixen K, Schjerling P, Suetta C, Madsen K. Suppression of testosterone does not blunt mRNA expression of myoD, myogenin, IGF, myostatin or androgen receptor post strength training in humans. *J Physiol.* 2007 Jan 15;578(Pt 2):579-93.
238. Gold J, Batterham MJ, Rekers H, Harms MK, Geurts TB, Helmyr PM, Silva de Mendonça J, Falleiros Carvalho LH, Panos G, Pinchera A, Aiuti F, Lee C, Horban A, Gatell J, Phanuphak P, Prasithsirikul W, Gazzard B, Bloch M, Danner SA; E-1696 Study Investigators.. Effects of nandrolone decanoate compared with placebo or testosterone on HIV-associated wasting. *HIV Med.* 2006 Apr;7(3):146-55.
239. Rabkin JG, McElhiney MC, Rabkin R, Lin SH. Testosterone versus fluoxetine for depression and fatigue in HIV/AIDS: a placebo-controlled trial. *J Clin Psychopharmacol.* 2004 Aug;24(4):379-85.
240. No authors listed] Testosterone for weight loss. *TreatmentUpdate.* 1998 Sep;10(7):6-8.
241. Fairfield WP, Treat M, Rosenthal DI, Frontera W, Stanley T, Corcoran C, Costello M, Parlman K, Schoenfeld D, Klibanski A, Grinspoon S. Effects of testosterone and exercise on muscle leanness in eugonadal men with AIDS wasting. *J Appl Physiol* (1985). 2001 Jun;90(6):2166-71.
242. Grinspoon S, Corcoran C, Parlman K, Costello M, Rosenthal D, Anderson E, Stanley T, Schoenfeld D, Burrows B, Hayden D, Basgoz N, Klibanski A. Effects of testosterone and progressive resistance training in eugonadal men with AIDS wasting. A randomized, controlled trial. *Ann Intern Med.* 2000 Sep 5;133(5):348-55.
243. Bhasin S, Storer TW, Javanbakht M, Berman N, Yarasheski KE, Phillips J, Dike M, Sinha-Hikim I, Shen R, Hays RD, Beall G. Testosterone replacement and resistance exercise in HIV-infected men with weight loss and low testosterone levels. *JAMA.* 2000 Feb 9;283(6):763-70.
244. Rabkin JG, Wagner GJ, Rabkin R. A double-blind, placebo-controlled trial of testosterone therapy for HIV-positive men with hypogonadal symptoms. *Arch Gen Psychiatry.* 2000 Feb;57(2):141-7
245. Grinspoon S, Corcoran C, Stanley T, Baaj A, Basgoz N, Klibanski A. Effects of hypogonadism and testosterone administration on depression indices in HIV-infected men. *J Clin Endocrinol Metab.* 2000 Jan;85(1):60-5.
246. Dobs AS, Cofrancesco J, Nolten WE, Danoff A, Anderson R, Hamilton CD, Feinberg J, Seekins D, Yangco B, Rhame F. The use of a transscrotal testosterone delivery system in the treatment of patients with weight loss related to human immunodeficiency virus infection. *Am J Med.* 1999 Aug;107(2):126-32.
247. Rabkin JG, Wagner GJ, Rabkin R. Testosterone therapy for human immunodeficiency virus-positive men with and without hypogonadism. *J Clin Psychopharmacol.* 1999 Feb;19(1):19-27.
248. Bhasin S, Storer TW, Asbel-Sethi N, Kilbourne A, Hays R, Sinha-Hikim I, Shen R, Arver S, Beall G. Effects of testosterone replacement with a nongenital, transdermal system, Androderm, in human immunodeficiency virus-infected men with low testosterone levels. *J Clin Endocrinol Metab.* 1998 Sep;83(9):3155-62. Charles R. Drew University of Medicine and Science, Los Angeles, California 90059, USA
249. Coodley GO, Coodley MK. A trial of testosterone therapy for HIV-associated weight loss. *AIDS.* 1997 Sep;11(11):1347-52.
250. Rabkin JG, Wagner G, Rabkin R. Treatment of depression in HIV+men: Literature review and report of an ongoing study of testosterone replacement therapy. *Ann Behav Med.* 1996 Mar;18(1):24-9.

Overall cancer

251. Del Fabbro E, Garcia JM, Dev R, Hui D, Williams J, Engineer D, Palmer JL, Schover L, Bruera E. Testosterone replacement for fatigue in hypogonadal ambulatory males with advanced cancer: a preliminary double-blind placebo-controlled trial. *Support Care Cancer.* 2013 Sep;21(9):2599-607
252. Howell SJ, Radford JA, Adams JE, Smets EM, Warburton R, Shalet SM. Randomized placebo-controlled trial of testosterone replacement in men with mild Leydig cell insufficiency following cytotoxic chemotherapy. *Clin Endocrinol (Oxf).* 2001 Sep;55(3):315-24.

Prostate cancer

253. Ory J, Flannigan R, Lundeen C, Huang JG, Pommerville P, Goldenberg SL. Testosterone therapy in patients with treated and untreated prostate cancer: impact on oncologic outcomes. *J Urol.* 2016 Oct;196(4):1082-9

Sexual dysfunction: low sex drive, erectile dysfunction, reduced ejaculatory unction

254. Maggi M, Heiselman D, Knorr J, Iyengar S, Paduch DA, Donatucci CF. Impact of testosterone solution 2% on ejaculatory dysfunction in hypogonadal men. *J Sex Med.* 2016 Aug;13(8):1220-6
255. Spitzer M, Basaria S, Travison TG, Davda MN, Paley A, Cohen B, Mazer NA, Knapp PE, Hanka S, Lakshman KM, Ulloor J, Zhang A, Orwoll K, Eder R, Collins L, Mohammed N, Rosen RC, DeRogatis L, Bhasin S. Effect of

REFERENCES preceded by « 2/ »

- testosterone replacement on response to sildenafil citrate in men with erectile dysfunction: a parallel, randomized trial. *Ann Intern Med.* 2012 Nov 20;157(10):681-91
256. Buvat J, Montorsi F, Maggi M, Porst H, Kaipia A, Colson MH, Cuzin B, Moncada I, Martin-Morales A, Yassin A, Meuleman E, Eardley I, Dean JD, Shabsigh R. Hypogonadal men nonresponders to the PDE5 inhibitor tadalafil benefit from normalization of testosterone levels with a 1% hydroalcoholic testosterone gel in the treatment of erectile dysfunction (TADTEST study). *J Sex Med.* 2011 Jan;8(1):284-93
 257. Morales A, Black A, Emerson L, Barkin J, Kuzmarov I, Day A. Androgens and sexual function: a placebo-controlled, randomized, double-blind study of testosterone vs. dehydroepiandrosterone in men with sexual dysfunction and androgen deficiency. *Aging Male.* 2009 Dec;12(4):104-12.
 258. Chiang HS, Cho SL, Lin YC, Hwang TI. Testosterone gel monotherapy improves sexual function of hypogonadal men mainly through restoring erection: evaluation by IIEF score. *Urology.* 2009 Apr;73(4):762-6.
 259. Shabsigh R, Kaufman JM, Steidle C, Padma-Nathan H. Randomized study of testosterone gel as adjunctive therapy to sildenafil in hypogonadal men with erectile dysfunction who do not respond to sildenafil alone. *J Urol.* 2008 May;179(5 Suppl):S97-S102.
 260. Merza Z, Blumsohn A, Mah PM, Meads DM, McKenna SP, Wylie K, Eastell R, Wu F, Ross RJ. Double-blind placebo-controlled study of testosterone patch therapy on bone turnover in men with borderline hypogonadism. *Int J Androl.* 2006 Jun;29(3):381-91.
 261. Shabsigh R, Kaufman JM, Steidle C, Padma-Nathan H. Randomized study of testosterone gel as adjunctive therapy to sildenafil in hypogonadal men with erectile dysfunction who do not respond to sildenafil alone. *J Urol.* 2004 Aug;172(2):658-63.
 262. Schiavi RC, White D, Mandeli J, Levine AC. Effect of testosterone administration on sexual behavior and mood in men with erectile dysfunction. *Arch Sex Behav.* 1997 Jun;26(3):231-41.
 263. Aydin S, Odabaş O, Ercan M, Kara H, Ağargün MY. Efficacy of testosterone, trazodone and hypnotic suggestion in the treatment of non-organic male sexual dysfunction. *Br J Urol.* 1996 Feb;77(2):256-60.
 264. Clopper RR, Voorhess ML, MacGillivray MH, Lee PA, Mills B. Psychosexual behavior in hypopituitary men: a controlled comparison of gonadotropin and testosterone replacement. *Psychoneuroendocrinology.* 1993;18(2):149-61.
 265. Nankin HR, Lin T, Osterman J. Chronic testosterone cypionate therapy in men with secondary impotence. *Fertil Steril.* 1986 Aug;46(2):300-7
 266. O'Carroll R, Bancroft J. Testosterone therapy for low sexual interest and erectile dysfunction in men: a controlled study. *Br J Psychiatry.* 1984 Aug;145:146-51
 267. Salmimies P, Kockott G, Pirke KM, Vogt HJ, Schill WB. Effects of testosterone replacement on sexual behavior in hypogonadal men. *Arch Sex Behav.* 1982 Aug;11(4):345-53.
 268. Benkert O, Witt W, Adam W, Leitz A. Effects of testosterone undecanoate on sexual potency and the hypothalamic-pituitary-gonadal axis of impotent males. *Arch Sex Behav.* 1979 Nov;8(6):471-9.
 269. Paduch DA, Polzer PK, Ni X, Basaria S. Testosterone replacement in androgen-deficient men with ejaculatory dysfunction: a randomized controlled trial. *J Clin Endocrinol Metab.* 2015 Aug;100(8):2956-62.
 270. Spitzer M, Basaria S, Travison TG, Davda MN, DeRogatis L, Bhasin S. The effect of testosterone on mood and well-being in men with erectile dysfunction in a randomized, placebo-controlled trial. *Andrology.* 2013 May;1(3):475-82

Lack of fertility

271. Adamopoulos DA, Pappa A, Billa E, Nicopoulou S, Koukkou E, Michopoulos J. Effectiveness of combined tamoxifen citrate and testosterone undecanoate treatment in men with idiopathic oligozoospermia. *Fertil Steril.* 2003 Oct;80(4):914-20.
272. Adamopoulos DA, Nicopoulou S, Kapolla N, Karamertzanis M, Andreou E. The combination of testosterone undecanoate with tamoxifen citrate enhances the effects of each agent given independently on seminal parameters in men with idiopathic oligozoospermia. *Fertil Steril.* 1997 Apr;67(4):756-62.
273. Comhaire F, Schoonjans F, Abdelmassih R, Gordts S, Campo R, Dhont M, Milingos S, Gerris J. Does treatment with testosterone undecanoate improve the in-vitro fertilizing capacity of spermatozoa in patients with idiopathic testicular failure? (results of a double blind study). *Hum Reprod.* 1995 Oct;10(10):2600-2.
274. Adamopoulos DA, Nicopoulou S, Kapolla N, Vassilopoulos P, Karamertzanis M, Kontogeorgos L. Endocrine effects of testosterone undecanoate as a supplementary treatment to menopausal gonadotropins or tamoxifen citrate in idiopathic oligozoospermia. *Fertil Steril.* 1995 Oct;64(4):818-24.
275. Gregoriou O, Papadias C, Gargaropoulos A, Konidaris S, Kontogeorgi Z, Kalampokas E. Treatment of idiopathic infertility with testosterone undecanoate. A double blind study. *Clin Exp Obstet Gynecol.* 1993;20(1):9-12.
276. Comhaire F. Treatment of idiopathic testicular failure with high-dose testosterone undecanoate: a double-blind pilot study. *Fertil Steril.* 1990 Oct;54(4):689-93.
277. Pusch HH. Oral treatment of oligozoospermia with testosterone-undecanoate: results of a double-blind-placebo-controlled trial. *Andrologia.* 1989 Jan-Feb;21(1):76-82.

REFERENCES preceded by « 2/ »

278. Wang C, Chan CW, Wong KK, Yeung KK. Comparison of the effectiveness of placebo, clomiphene citrate, mesterolone, pentoxifylline, and testosterone rebound therapy for the treatment of idiopathic oligospermia. *Fertil Steril*. 1983 Sep;40(3):358-65

Neuropsychiatric diseases in adult men

Cognitive impairment

279. Wahjoepramono EJ, Asih PR, Aniwiyanti V, Taddei K, Dhaliwal SS, Fuller SJ, Foster J, Carruthers M, Verdile G, Sohrabi HR, Martins RN. The effects of testosterone supplementation on cognitive functioning in older men. *CNS Neurol Disord Drug Targets*. 2016;15(3):337-43.
280. Asih PR, Wahjoepramono EJ, Aniwiyanti V, Wijaya LK, de Ruyck K, Taddei K, Fuller SJ, Sohrabi H, Dhaliwal SS, Verdile G, Carruthers M, Martins RN. Testosterone replacement therapy in older male subjective memory complainers: double-blind randomized crossover placebo-controlled clinical trial of physiological assessment and safety. *CNS Neurol Disord Drug Targets*. 2015;14(5):576-86.
281. Cherrier MM, Anderson K, Shofer J, Millard S, Matsumoto AM. Testosterone treatment of men with mild cognitive impairment and low testosterone levels. *Am J Alzheimers Dis Other Dement*. 2015 Jun;30(4):421-30
282. Lu PH, Masterman DA, Mulnard R, Cotman C, Miller B, Yaffe K, Reback E, Porter V, Swerdloff R, Cummings JL. Effects of testosterone on cognition and mood in male patients with mild Alzheimer disease and healthy elderly men. *Arch Neurol*. 2006 Feb;63(2):177-85.
283. Cherrier MM, Matsumoto AM, Amory JK, Asthana S, Bremner W, Peskind ER, Raskind MA, Craft S. Testosterone improves spatial memory in men with Alzheimer disease and mild cognitive impairment. *Neurology*. 2005 Jun 28;64(12):2063-8.
284. Kenny AM, Fabregas G, Song C, Biskup B, Bellantonio S. Effects of testosterone on behavior, depression, and cognitive function in older men with mild cognitive loss. *J Gerontol A Biol Sci Med Sci*. 2004 Jan;59(1):75-8.
285. Tan RS, Pu SJ. A pilot study on the effects of testosterone in hypogonadal aging male patients with Alzheimer's disease. *Aging Male*. 2003 Mar;6(1):13-7.
286. Kenny AM, Bellantonio S, Gruman CA, Acosta RD, Prestwood KM. Effects of transdermal testosterone on cognitive function and health perception in older men with low bioavailable testosterone levels. *J Gerontol A Biol Sci Med Sci*. 2002 May;57(5):M321-5.
287. O'Connor DB, Archer J, Hair WM, Wu FC. Activational effects of testosterone on cognitive function in men. *Neuropsychologia*. 2001;39(13):1385-94.
288. Wolf OT, Preut R, Hellhammer DH, Kudielka BM, Schürmeyer TH, Kirschbaum C. Testosterone and cognition in elderly men: a single testosterone injection blocks the practice effect in verbal fluency, but has no effect on spatial or verbal memory. *Biol Psychiatry*. 2000 Apr 1;47(7):650-4.

Depression

289. Amiaz R, Pope HG Jr, Mahne T, Kelly JF, Brennan BP, Kanayama G, Weiser M, Hudson JI, Seidman SN. Testosterone gel replacement improves sexual function in depressed men taking serotonergic antidepressants: a randomized, placebo-controlled clinical trial. *J Sex Marital Ther*. 2011;37(4):243-54.
290. Pope HG Jr, Amiaz R, Brennan BP, Orr G, Weiser M, Kelly JF, Kanayama G, Siegel A, Hudson JI, Seidman SN. Parallel-group placebo-controlled trial of testosterone gel in men with major depressive disorder displaying an incomplete response to standard antidepressant treatment. *J Clin Psychopharmacol*. 2010 Apr;30(2):126-34.
291. Shores MM, Kivlahan DR, Sadak TI, Li EJ, Matsumoto AM. A randomized, double-blind, placebo-controlled study of testosterone treatment in hypogonadal older men with subthreshold depression (dysthymia or minor depression). *J Clin Psychiatry*. 2009 Jul;70(7):1009-16.
292. Seidman SN, Orr G, Raviv G, Levi R, Roose SP, Kravitz E, Amiaz R, Weiser M. Effects of testosterone replacement in middle-aged men with dysthymia: a randomized, placebo-controlled clinical trial. *J Clin Psychopharmacol*. 2009 Jun;29(3):216-21.
293. Seidman SN, Roose SP. The sexual effects of testosterone replacement in depressed men: randomized, placebo-controlled clinical trial. *J Sex Marital Ther*. 2006 May-Jun;32(3):267-73.
294. Seidman SN, Miyazaki M, Roose SP. Intramuscular testosterone supplementation to selective serotonin reuptake inhibitor in treatment-resistant depressed men: randomized placebo-controlled clinical trial. *J Clin Psychopharmacol*. 2005 Dec;25(6):584-8.
295. Orengo CA, Fullerton L, Kunik ME. Safety and efficacy of testosterone gel 1% augmentation in depressed men with partial response to antidepressant therapy. *J Geriatr Psychiatry Neurol*. 2005 Mar;18(1):20-4.
296. Pope HG Jr, Cohane GH, Kanayama G, Siegel AJ, Hudson JI. Testosterone gel supplementation for men with refractory depression: a randomized, placebo-controlled trial. *Am J Psychiatry*. 2003 Jan;160(1):105-11.
297. Seidman SN, Spatz E, Rizzo C, Roose SP. Testosterone replacement therapy for hypogonadal men with major depressive disorder: a randomized, placebo-controlled clinical trial. *J Clin Psychiatry*. 2001 Jun;62(6):406-12.
298. Seidman SN, Rabkin JG. Testosterone replacement therapy for hypogonadal men with SSRI-refractory depression. *J Affect Disord*. 1998 Mar;48(2-3):157-61.

REFERENCES preceded by « 2/ »

Social anxiety

299. Terburg D, Syal S, Rosenberger LA, Heany SJ, Stein DJ, Honk Jv. Testosterone abolishes implicit subordination in social anxiety. *Psychoneuroendocrinology*. 2016 Oct;72:205-11

Schizophrenia

300. Ko YH, Lew YM, Jung SW, Joe SH, Lee CH, Jung HG, Lee MS. Short-term testosterone augmentation in male schizophrenics: a randomized, double-blind, placebo-controlled trial. *J Clin Psychopharmacol*. 2008 Aug;28(4):375-83.

Drug addiction, opioid-induced androgen deficiency

301. Huang G, Travison T, Maggio M, Edwards RR, Basaria S. Effects of testosterone replacement on metabolic and inflammatory markers in men with opioid-induced androgen deficiency. *Clin Endocrinol (Oxf)*. 2016 Aug;85(2):232-8
302. Basaria S, Travison TG, Alford D, Knapp PE, Teeter K, Cahalan C, Eder R, Lakshman K, Bachman E, Mensing G, Martel MO, Le D, Stroh H, Bhasin S, Wasan AD, Edwards RR. Effects of testosterone replacement in men with opioid-induced androgen deficiency: a randomized controlled trial. *Pain*. 2015 Feb;156(2):280-8

Parkinson's disease

303. Okun MS, Fernandez HH, Rodriguez RL, Romrell J, Suelter M, Munson S, Louis ED, Mulligan T, Foster PS, Shenal BV, Armaghani SJ, Jacobson C, Wu S, Crucian G. Testosterone therapy in men with Parkinson disease: results of the TEST-PD Study. *Arch Neurol*. 2006 May;63(5):729-35.

Somatic underdevelopment in boys

Hypospadias, penis hypotrophy in boys

304. Paiva KC, Bastos AN, Miana LP, Barros Ede S, Ramos PS, Miranda LM, Faria NM, Avarese de Figueiredo A, de Bessa J Jr, Netto JM. Biometry of the hypospadiac penis after hormone therapy (testosterone and estrogen): A randomized, double-blind controlled trial. *J Pediatr Urol*. 2016 Aug;12(4):200.e1-6

Puberty delay, short stature: testosterone treatment for puberty initiation and growth improvement in prepuber adolescent boys

305. Gupta MK, Brown DC, Faiman C, Kelnar CJ, Wu FC. Effect of low-dose testosterone treatment on androgen regulated proteins prostate specific antigen and sex hormone binding globulin in short prepubertal boys: lack of initiation of puberty. *J Pediatr Endocrinol Metab*. 2003 Jan;16(1):55-62.
306. Finkelstein JW, Susman EJ, Chinchilli VM, D'Arcangelo MR, Kunselman SJ, Schwab J, Demers LM, Liben LS, Kulin HE. Effects of estrogen or testosterone on self-reported sexual responses and behaviors in hypogonadal adolescents. *J Clin Endocrinol Metab*. 1998 Jul;83(7):2281-5.
307. Finkelstein JW, Susman EJ, Chinchilli VM, Kunselman SJ, D'Arcangelo MR, Schwab J, Demers LM, Liben LS, Lookingbill G, Kulin HE. Estrogen or testosterone increases self-reported aggressive behaviors in hypogonadal adolescents. *J Clin Endocrinol Metab*. 1997 Aug;82(8):2433-8.
308. Crowne EC, Wallace WH, Moore C, Mitchell R, Robertson WH, Holly JM, Shalet SM. Effect of low dose oxandrolone and testosterone treatment on the pituitary-testicular and GH axes in boys with constitutional delay of growth and puberty. *Clin Endocrinol (Oxf)*. 1997 Feb;46(2):209-16.
309. Brown DC, Butler GE, Kelnar CJ, Wu FC. A double blind, placebo controlled study of the effects of low dose testosterone undecanoate on the growth of small for age, prepubertal boys. *Arch Dis Child*. 1995 Aug;73(2):131-5.
310. Crowne EC, Wallace WH, Moore C, Mitchell R, Robertson WR, Shalet SM. Degree of activation of the pituitary-testicular axis in early pubertal boys with constitutional delay of growth and puberty determines the growth response to treatment with testosterone or oxandrolone. *J Clin Endocrinol Metab*. 1995 Jun;80(6):1869-75.
311. Gregory JW, Greene SA, Thompson J, Scrimgeour CM, Rennie MJ. Effects of oral testosterone undecanoate on growth, body composition, strength and energy expenditure of adolescent boys. *Clin Endocrinol (Oxf)*. 1992 Sep;37(3):207-13.
312. Kassmann K, Rappaport R, Broyer M. The short-term effect of testosterone on growth in boys on hemodialysis. *Clin Nephrol*. 1992 Mar;37(3):148-54.

Testosterone in women: 103 placebo-controlled studies – all in adults

Healthy women

Healthy young women

313. Wu Y, Liu J, Qu L, Eisenegger C, Clark L, Zhou X. Single dose testosterone administration reduces loss chasing in healthy females. *Psychoneuroendocrinology*. 2016 Sep;71:54-7
314. Chen C, Decety J, Huang PC, Chen CY, Cheng Y. Testosterone administration in females modulates moral judgment and patterns of brain activation and functional connectivity. *Hum Brain Mapp*. 2016 Oct;37(10):3417-30.
315. Kopsida E, Berrebi J, Petrovic P, Ingvar M. Testosterone Administration Related Differences in Brain Activation during the Ultimatum Game. *Front Neurosci*. 2016 Mar 1;10:66
316. Olsson A, Kopsida E, Sorjonen K, Savic I. Testosterone and estrogen impact social evaluations and vicarious emotions: A double-blind placebo-controlled study. *Emotion*. 2016 Jun;16(4):515-23.
317. van Honk J, Will GJ, Terburg D, Raub W, Eisenegger C, Buskens V. Effects of testosterone administration on strategic gambling in poker play. *Sci Rep*. 2016 Jan 4;6:18096
318. Pintzka CW, Evensmoen HR, Lehn H, Håberg AK. Changes in spatial cognition and brain activity after a single dose of testosterone in healthy women. *Behav Brain Res*. 2016 Feb 1;298(Pt B):78-90.
319. Enter D, Terburg D, Harrewijn A, Spinhoven P, Roelofs K. Single dose testosterone administration alleviates gaze avoidance in women with Social Anxiety Disorder. *Psychoneuroendocrinology*. 2016 Jan;63:26-33
320. Huang G, Pencina KM, Coady JA, Beleva YM, Bhasin S, Basaria S. Functional voice testing detects early changes in vocal pitch in women during testosterone administration. *J Clin Endocrinol Metab*. 2015 Jun;100(6):2254-60
321. Chen C, Chen CY, Yang CY, Lin CH, Cheng Y. Testosterone modulates preattentive sensory processing and involuntary attention switches to emotional voices. *J Neurophysiol*. 2015 Mar 15;113(6):1842-9.
322. Sharma AN, Aoun P, Wigham JR, Weist SM, Veldhuis JD. Estradiol, but not testosterone, heightens cortisol-mediated negative feedback on pulsatile ACTH secretion and ACTH approximate entropy in unstressed older men and women. *Am J Physiol Regul Integr Comp Physiol*. 2014 May;306(9):R627-35.
323. Enter D, Spinhoven P, Roelofs K. Alleviating social avoidance: effects of single dose testosterone administration on approach-avoidance action. *Horm Behav*. 2014 Apr;65(4):351
324. Montoya ER, Terburg D, Bos PA, Will GJ, Buskens V, Raub W, van Honk J. Testosterone administration modulates moral judgments depending on second-to-fourth digit ratio. *Psychoneuroendocrinology*. 2013 Aug;38(8):1362-9
325. Bos PA, Hermans EJ, Ramsey NF, van Honk J. The neural mechanisms by which testosterone acts on interpersonal trust. *Neuroimage*. 2012 Jul 2;61(3):730-7.
326. van Rooij K, Bloemers J, de Leede L, Goldstein I, Lentjes E, Koppeschaar H, Olivier B, Tuiten A. Pharmacokinetics of three doses of sublingual testosterone in healthy premenopausal women. *Psychoneuroendocrinology*. 2012 Jun;37(6):773-81.
327. Eisenegger C, Naef M. Combining behavioral endocrinology and experimental economics: testosterone and social decision making. *J Vis Exp*. 2011 Mar 2;(49).
328. Bos PA, Terburg D, van Honk J. Testosterone decreases trust in socially naive humans. *Proc Natl Acad Sci U S A*. 2010 Jun 1;107(22):9991-5.
329. Hermans EJ, Bos PA, Ossewaarde L, Ramsey NF, Fernández G, van Honk J. Effects of exogenous testosterone on the ventral striatal BOLD response during reward anticipation in healthy women. *Neuroimage*. 2010 Aug 1;52(1):277-83.
330. Eisenegger C, Naef M, Snozzi R, Heinrichs M, Fehr E. Prejudice and truth about the effect of testosterone on human bargaining behaviour. *Nature*. 2010 Jan 21;463(7279):356-9.
331. Bos PA, Hermans EJ, Montoya ER, Ramsey NF, van Honk J. Testosterone administration modulates neural responses to crying infants in young females. *Psychoneuroendocrinology*. 2010 Jan;35(1):114-21.
332. van Wingen G, Mattern C, Verkes RJ, Buitelaar J, Fernández G. Testosterone reduces amygdala-orbitofrontal cortex coupling. *Psychoneuroendocrinology*. 2010 Jan;35(1):105-13.
333. Aarts H, van Honk J. Testosterone and unconscious positive priming increase human motivation separately. *Neuroreport*. 2009 Sep 23;20(14):1300-3.
334. Zethraeus N, Kocoska-Maras L, Ellingsen T, von Schoultz B, Hirschberg AL, Johannesson M. A randomized trial of the effect of estrogen and testosterone on economic behavior. *Proc Natl Acad Sci U S A*. 2009 Apr 21;106(16):6535-8.
335. van Wingen G, Mattern C, Verkes RJ, Buitelaar J, Fernández G. Testosterone biases automatic memory processes in women towards potential mates. *Neuroimage*. 2008 Oct 15;43(1):114-20.
336. Hermans EJ, Putman P, Baas JM, Gecks NM, Kenemans JL, van Honk J. Exogenous testosterone attenuates the integrated central stress response in healthy young women. *Psychoneuroendocrinology*. 2007 Sep-Nov;32(8-10):1052-61.
337. Hermans EJ, Ramsey NF, van Honk J. Exogenous testosterone enhances responsiveness to social threat in the neural circuitry of social aggression in humans. *Biol Psychiatry*. 2008 Feb 1;63(3):263-70.

REFERENCES preceded by « 2/ »

338. van Honk J, Schutter DJ. Testosterone reduces conscious detection of signals serving social correction: implications for antisocial behavior. *Psychol Sci.* 2007 Aug;18(8):663-7.
339. Ahuja D, Mateika JH, Diamond MP, Badr MS. Ventilatory sensitivity to carbon dioxide before and after episodic hypoxia in women treated with testosterone. *J Appl Physiol* (1985). 2007 May;102(5):1832-8.
340. Hermans EJ, Putman P, van Honk J. Testosterone administration reduces empathetic behavior: a facial mimicry study. *Psychoneuroendocrinology.* 2006 Aug;31(7):859-66.
341. Apperloo M, Midden M, van der Stege J, Wouda J, Hoek A, Weijmar Schultz W. Vaginal application of testosterone: A study on pharmacokinetics and the sexual response in healthy volunteers. *J Sex Med.* 2006 May;3(3):541-9.
342. Hermans EJ, Putman P, Baas JM, Koppeschaar HP, van Honk J. A single administration of testosterone reduces fear-potentiated startle in humans. *Biol Psychiatry.* 2006 May 1;59(9):872-4.
343. Schutter DJ, Peper JS, Koppeschaar HP, Kahn RS, van Honk J. Administration of testosterone increases functional connectivity in a cortico-cortical depression circuit. *J Neuropsychiatry Clin Neurosci.* 2005 Summer;17(3):372-7.
344. van Honk J, Peper JS, Schutter DJ. Testosterone reduces unconscious fear but not consciously experienced anxiety: implications for the disorders of fear and anxiety. *Biol Psychiatry.* 2005 Aug 1;58(3):218-25.
345. van Honk J, Schutter DJ, Hermans EJ, Putman P, Tuiten A, Koppeschaar H. Testosterone shifts the balance between sensitivity for punishment and reward in healthy young women. *Psychoneuroendocrinology.* 2004 Aug;29(7):937-43.
346. Dolan S, Wilkie S, Aliabadi N, Sullivan MP, Basgoz N, Davis B, Grinspoon S. Effects of testosterone administration in human immunodeficiency virus-infected women with low weight: a randomized placebo-controlled study. *Arch Intern Med.* 2004 Apr 26;164(8):897-904.
347. Aleman A, Bronk E, Kessels RP, Koppeschaar HP, van Honk J. A single administration of testosterone improves visuospatial ability in young women. *Psychoneuroendocrinology.* 2004 Jun;29(5):612-7.
348. Tuiten A, Van Honk J, Koppeschaar H, Bernaards C, Thijssen J, Verbaten R. Time course of effects of testosterone administration on sexual arousal in women. *Arch Gen Psychiatry.* 2000 Feb;57(2):149-53;
349. van Honk J, Tuiten A, Hermans E, Putman P, Koppeschaar H, Thijssen J, Verbaten R, van Doomen L. A single administration of testosterone induces cardiac accelerative responses to angry faces in healthy young women. *Behav Neurosci.* 2001 Feb;115(1):238-42.
350. Postma A, Meyer G, Tuiten A, van Honk J, Kessels RP, Thijssen J. Effects of testosterone administration on selective aspects of object-location memory in healthy young women. *Psychoneuroendocrinology.* 2000 Aug;25(6):563-75.

Young women undergoing in vitro fertilization procedures

351. Sipe CS, Thomas MR, Stegmann BJ, Van Voorhis BJ. Effects of exogenous testosterone supplementation in gonadotrophin stimulated cycles. *Hum Reprod.* 2010 Mar;25(3):690-6.
352. Massin N, Cedrin-Durnerin I, Coussieu C, Galey-Fontaine J, Wolf JP, Hugues JN. Effects of transdermal testosterone application on the ovarian response to FSH in poor responders undergoing assisted reproduction technique--a prospective, randomized, double-blind study. *Hum Reprod.* 2006 May;21(5):1204-11.

Testosterone-deficient women

Women of all ages with overt testosterone deficiency of all ages, serum testosterone level below the lower reference limit

353. Huang G, Tang E, Aakil A, Anderson S, Jara H, Davda M, Stroh H, Travison TG, Bhasin S, Basaria S. Testosterone dose-response relationships with cardiovascular risk markers in androgen-deficient women: a randomized, placebo-controlled trial. *J Clin Endocrinol Metab.* 2014 Jul;99(7):E1287-93
354. Lin E, McCabe E, Newton-Cheh C, Bloch K, Buys E, Wang T, Miller KK. Effects of transdermal testosterone on natriuretic peptide levels in women: a randomized placebo-controlled pilot study. *Fertil Steril.* 2012 Feb;97(2):489-93.
355. van Wingen GA, Zyllicz SA, Pieters S, Mattern C, Verkes RJ, Buitelaar JK, Fernández G. Testosterone increases amygdala reactivity in middle-aged women to a young adulthood level. *Neuropsychopharmacology.* 2009 Feb;34(3):539-47.

REFERENCES preceded by « 2/ »

356. Miller KK, Biller BM, Schaub A, Pulaski-Liebert K, Bradwin G, Rifai N, Klibanski A. Effects of testosterone therapy on cardiovascular risk markers in androgen-deficient women with hypopituitarism. *J Clin Endocrinol Metab.* 2007 Jul;92(7):2474-9.
357. Sherman JC, Swearingen B, Loeffler J, Klibanski A. Effects of testosterone replacement in androgen-deficient women with hypopituitarism: a randomized, double-blind, placebo-controlled study. *J Clin Endocrinol Metab.* 2006 May;91(5):1683-90.

Sexual dysfunction

358. van Rooij K, Poels S, Worst P, Bloemers J, Koppeschaar H, Goldstein A, Olivier B, Tuiten A. Efficacy of testosterone combined with a PDE5 inhibitor and testosterone combined with a serotonin (1A) receptor agonist in women with SSRI-induced sexual dysfunction. A preliminary study. *Eur J Pharmacol.* 2015 Apr 15;753:246-51.
359. Fooladi E, Bell RJ, Jane F, Robinson PJ, Kulkarni J, Davis SR. Testosterone improves antidepressant-emergent loss of libido in women: findings from a randomized, double-blind, placebo-controlled trial. *J Sex Med.* 2014 Mar;11(3):831-9.
360. Poels S, Bloemers J, van Rooij K, Goldstein I, Gerritsen J, van Ham D, van Mameren F, Chivers M, Everaerd W, Koppeschaar H, Olivier B, Tuiten A. Toward personalized sexual medicine (part 2): testosterone combined with a PDE5 inhibitor increases sexual satisfaction in women with HSDD and FSAD, and a low sensitive system for sexual cues. *J Sex Med.* 2013 Mar;10(3):810-23.
361. van Rooij K, Poels S, Bloemers J, Goldstein I, Gerritsen J, van Ham D, van Mameren F, Chivers M, Everaerd W, Koppeschaar H, Olivier B, Tuiten A. Toward personalized sexual medicine (part 3): testosterone combined with a Serotonin1A receptor agonist increases sexual satisfaction in women with HSDD and FSAD, and dysfunctional activation of sexual inhibitory mechanisms. *J Sex Med.* 2013 Mar;10(3):824-37.
362. van der Made F, Bloemers J, Yassem WE, Kleiverda G, Everaerd W, van Ham D, Olivier B, Koppeschaar H, Tuiten A. The influence of testosterone combined with a PDE5-inhibitor on cognitive, affective, and physiological sexual functioning in women suffering from sexual dysfunction. *J Sex Med.* 2009 Mar;6(3):777-90.
363. der Made F, Bloemers J, van Ham D, El Yassem W, Kleiverda G, Everaerd W, Olivier B, Tuiten A. Childhood sexual abuse, selective attention for sexual cues and the effects of testosterone with or without vardenafil on physiological sexual arousal in women with sexual dysfunction: a pilot study. *J Sex Med.* 2009 Feb;6(2):429-39.
364. Davis SR, Moreau M, Kroll R, Bouchard C, Panay N, Gass M, Braunstein GD, Hirschberg AL, Rodenberg C, Pack S, Koch H, Moufarege A, Studd J; APHRODITE Study Team.. Testosterone for low libido in postmenopausal women not taking estrogen. *N Engl J Med.* 2008 Nov 6;359(19):2005-17. Monash University, Prahran, Australia
365. Davis S, Papalia MA, Norman RJ, O'Neill S, Redelman M, Williamson M, Stuckey BG, Wlodarczyk J, Gardner K, Humberstone A. Safety and efficacy of a testosterone metered-dose transdermal spray for treating decreased sexual satisfaction in premenopausal women: a randomized trial. *Ann Intern Med.* 2008 Apr 15;148(8):569-77
366. El-Hage G, Eden JA, Manga RZ. A double-blind, randomized, placebo-controlled trial of the effect of testosterone cream on the sexual motivation of menopausal hysterectomized women with hypoactive sexual desire disorder. *Climacteric.* 2007 Aug;10(4):335-43.
367. Kingsberg S, Shifren J, Wekselman K, Rodenberg C, Koochaki P, Derogatis L. Evaluation of the clinical relevance of benefits associated with transdermal testosterone treatment in postmenopausal women with hypoactive sexual desire disorder. *J Sex Med.* 2007 Jul;4(4 Pt 1):1001-8.
368. Barton DL, Wender DB, Sloan JA, Dalton RJ, Balcueva EP, Atherton PJ, Bernath AM Jr, DeKrey WL, Larson T, Bearden JD 3rd, Carpenter PC, Loprinzi CL. Randomized controlled trial to evaluate transdermal testosterone in female cancer survivors with decreased libido; North Central Cancer Treatment Group protocol N02C3. *J Natl Cancer Inst.* 2007 May 2;99(9):672-9.
369. Chudakov B, Ben Zion IZ, Belmaker RH. Transdermal testosterone gel prn application for hypoactive sexual desire disorder in premenopausal women: a controlled pilot study of the effects on the arizona sexual experiences scale for females and sexual function questionnaire. *J Sex Med.* 2007 Jan;4(1):204-8.
370. Shifren JL, Davis SR, Moreau M, Waldbaum A, Bouchard C, DeRogatis L, Derzko C, Beamson P, Kakos N, O'Neill S, Levine S, Wekselman K, Buch A, Rodenberg C, Kroll R. Testosterone patch for the treatment of hypoactive sexual desire disorder in naturally menopausal women: results from the INTIMATE NM1 Study. *Menopause.* 2006 Sep-Oct;13(5):770-9. Erratum in: *Menopause.* 2007 Jan-Feb;14(1):157.
371. Davis SR, van der Mooren MJ, van Lunsen RH, Lopes P, Ribot C, Rees M, Moufarege A, Rodenberg C, Buch A, Purdie DW. Efficacy and safety of a testosterone patch for the treatment of hypoactive sexual desire disorder in surgically menopausal women: a randomized, placebo-controlled trial. *Menopause.* 2006 May-Jun;13(3):387-96. Erratum in: *Menopause.* 2006 Sep-Oct;13(5):850.
372. Nathorst-Böös J, Flöter A, Jarkander-Rolff M, Carlström K, Schoultz Bv. Treatment with percutaneous testosterone gel in postmenopausal women with decreased libido--effects on sexuality and psychological general well-being. *Maturitas.* 2006 Jan 10;53(1):11-8.

REFERENCES preceded by « 2/ »

373. Braunstein GD, Sundwall DA, Katz M, Shifren JL, Buster JE, Simon JA, Bachman G, Aguirre OA, Lucas JD, Rodenberg C, Buch A, Watts NB. Safety and efficacy of a testosterone patch for the treatment of hypoactive sexual desire disorder in surgically menopausal women: a randomized, placebo-controlled trial. *Arch Intern Med*. 2005 Jul 25;165(14):1582-9.
374. Simon J, Braunstein G, Nachtigall L, Utian W, Katz M, Miller S, Waldbaum A, Bouchard C, Derzko C, Buch A, Rodenberg C, Lucas J, Davis S. Testosterone patch increases sexual activity and desire in surgically menopausal women with hypoactive sexual desire disorder. *J Clin Endocrinol Metab*. 2005 Sep;90(9):5226-33.
375. Goldstat R, Briganti E, Tran J, Wolfe R, Davis SR. Transdermal testosterone therapy improves well-being, mood, and sexual function in premenopausal women. *Menopause*. 2003 Sep-Oct;10(5):390-8.
376. Shifren JL, Braunstein GD, Simon JA, Casson PR, Buster JE, Redmond GP, Burki RE, Ginsburg ES, Rosen RC, Leiblum SR, Caramelli KE, Mazer NA. Transdermal testosterone treatment in women with impaired sexual function after oophorectomy. *N Engl J Med*. 2000 Sep 7;343(10):682-8.
377. Tuiten A, Laan E, Panhuysen G, Everaerd W, de Haan E, Koppeschaar H, Vroon P. Discrepancies between genital responses and subjective sexual function during testosterone substitution in women with hypothalamic amenorrhea. *Psychosom Med*. 1996 May-Jun;58(3):234-41.

Women with hysterectomy with or without oophorectomy

378. Huang G, Basaria S, Travison TG, Ho MH, Davda M, Mazer NA, Micek R, Knapp PE, Zhang A, Collins L, Ursino M, Appleman E, Dzekov C, Stroh H, Ouellette M, Rundell T, Baby M, Bhatia NN, Khorram O, Friedman T, Storer TW, Bhasin S. Testosterone dose-response relationships in hysterectomized women with or without oophorectomy: effects on sexual function, body composition, muscle performance and physical function in a randomized trial. *Menopause*. 2014 Jun;21(6):612-23

Cognitive dysfunction

379. Huang G, Wharton W, Travison TG, Ho MH, Gleason C, Asthana S, Bhasin S, Basaria S. Effects of testosterone administration on cognitive function in hysterectomized women with low testosterone levels: a dose-response randomized trial. *J Endocrinol Invest*. 2015 Apr;38(4):455-61

Women with primary ovarian deficiency

380. Popat VB, Calis KA, Kalantaridou SN, Vanderhoof VH, Koziol D, Troendle JF, Reynolds JC, Nelson LM. Bone mineral density in young women with primary ovarian insufficiency: results of a three-year randomized controlled trial of physiological transdermal estradiol and testosterone replacement. *J Clin Endocrinol Metab*. 2014 Sep;99(9):3418-26.
381. Guerrieri GM, Martinez PE, Klug SP, Haq NA, Vanderhoof VH, Koziol DE, Popat VB, Kalantaridou SN, Calis KA, Rubinow DR, Schmidt PJ, Nelson LM. Effects of physiologic testosterone therapy on quality of life, self-esteem, and mood in women with primary ovarian insufficiency. *Menopause*. 2014 Sep;21(9):952-61.

Anorexia nervosa women

382. Miller KK, Meenaghan E, Lawson EA, Misra M, Gleysteen S, Schoenfeld D, Herzog D, Klibanski A. Effects of risedronate and low-dose transdermal testosterone on bone mineral density in women with anorexia nervosa: a randomized, placebo-controlled study. *J Clin Endocrinol Metab*. 2011 Jul;96(7):2081-8.
383. Miller KK, Deckersbach T, Rauch SL, Fischman AJ, Grieco KA, Herzog DB, Klibanski A. Testosterone administration attenuates regional brain hypometabolism in women with anorexia nervosa. *Psychiatry Res*. 2004 Dec 30;132(3):197-207.

Lupus erythematosus

384. Gordon C, Wallace DJ, Shinada S, Kalunian KC, Forbess L, Braunstein GD, Weisman MH. Testosterone patches in the management of patients with mild/moderate systemic lupus erythematosus. *Rheumatology (Oxford)*. 2008 Mar;47(3):334-8.

Postmenopausal women

385. Golebiowski B, Badarudin N, Eden J, Gerrand L, Robinson J, Liu J, Hampel U, You J, Stapleton F. The effects of transdermal testosterone and oestrogen therapy on dry eye in postmenopausal women: a randomised, placebo-controlled, pilot study. *Br J Ophthalmol*. 2016 Nov 3. pii: bjophthalmol-2016-309498.
386. Fernandes T, Costa-Paiva LH, Pedro AO, Baccaro LF, Pinto-Neto AM. Efficacy of vaginally applied estrogen, testosterone, or polyacrylic acid on vaginal atrophy: a randomized controlled trial. *Menopause*. 2016 Jul;23(7):792-8
387. Tungmunsakulchai R, Chaikittisilpa S, Snaboon T, Panyakhamlerd K, Jaisamram U, Taechakraichana N. Effectiveness of a low dose testosterone undecanoate to improve sexual function in postmenopausal women. *BMC Womens Health*. 2015 Dec 2;15:113.
388. Davis SR, Jane F, Robinson PJ, Davison SL, Worsley R, Maruff P, Bell RJ. Transdermal testosterone improves verbal learning and memory in postmenopausal women not on oestrogen therapy. *Clin Endocrinol (Oxf)*. 2014 Oct;81(4):621-8
389. Fernandes T, Costa-Paiva LH, Pinto-Neto AM. Efficacy of vaginally applied estrogen, testosterone, or polyacrylic acid on sexual function in postmenopausal women: a randomized controlled trial. *J Sex Med*. 2014 May;11(5):1262-70 (vaginal mix)
390. Möller MC, Rådestad AF, von Schoultz B, Bartfai A. Effect of estrogen and testosterone replacement therapy on cognitive fatigue. *Gynecol Endocrinol*. 2013 Feb;29(2):173-6.
391. Kocoska-Maras L, Zethraeus N, Rådestad AF, Ellingsen T, von Schoultz B, Johannesson M, Hirschberg AL. A randomized trial of the effect of testosterone and estrogen on verbal fluency, verbal memory, and spatial ability in healthy postmenopausal women. *Fertil Steril*. 2011 Jan;95(1):152-7.
392. Möller MC, Bartfai AB, Rådestad AF. Effects of testosterone and estrogen replacement on memory function. *Menopause*. 2010 Sep-Oct;17(5):983-9.
393. Panay N, Al-Azzawi F, Bouchard C, Davis SR, Eden J, Lodhi I, Rees M, Rodenberg CA, Rymer J, Schwenkhausen A, Sturdee DW. Testosterone treatment of HSDD in naturally menopausal women: the ADORE study. *Climacteric*. 2010 Apr;13(2):121-31.
394. Kocoska-Maras L, Hirschberg AL, Byström B, Schoultz BV, Rådestad AF. Testosterone addition to estrogen therapy - effects on inflammatory markers for cardiovascular disease. *Gynecol Endocrinol*. 2009 Dec;25(12):823-7.
395. Davis SR, Hirschberg AL, Wagner LK, Lodhi I, von Schoultz B. The effect of transdermal testosterone on mammographic density in postmenopausal women not receiving systemic estrogen therapy. *J Clin Endocrinol Metab*. 2009 Dec;94(12):4907-13.
396. Flyckt RL, Liu J, Frasure H, Wekselman K, Buch A, Kingsberg SA. Comparison of salivary versus serum testosterone levels in postmenopausal women receiving transdermal testosterone supplementation versus placebo. *Menopause*. 2009 Jul-Aug;16(4):680-8.
397. Roth MY, Amory JK. Testosterone for low libido in postmenopausal women? *Expert Rev Endocrinol Metab*. 2009 Mar;4(2):131-133.
398. Hofling M, Lundström E, Azavedo E, Svane G, Hirschberg AL, von Schoultz B. Testosterone addition during menopausal hormone therapy: effects on mammographic breast density. *Climacteric*. 2007 Apr;10(2):155-63.
399. Heard-Davison A, Heiman JR, Kuffel S. Genital and subjective measurement of the time course effects of an acute dose of testosterone vs. placebo in postmenopausal women. *J Sex Med*. 2007 Jan;4(1):209-17.
400. Hofling M, Hirschberg AL, Skoog L, Tani E, Hägerström T, von Schoultz B. Testosterone inhibits estrogen/progestogen-induced breast cell proliferation in postmenopausal women. *Menopause*. 2007 Mar-Apr;14(2):183-90.
401. Flöter A, Nathorst-Böös J, Carlström K, Ohlsson C, Ringertz H, Schoultz Bv. Effects of combined estrogen/testosterone therapy on bone and body composition in oophorectomized women. *Gynecol Endocrinol*. 2005 Mar;20(3):155-60.
402. Soares-Welch C, Mielke KL, Bowers CY, Veldhuis JD. Short-term testosterone supplementation does not activate GH and IGF-I production in postmenopausal women. *Clin Endocrinol (Oxf)*. 2005 Jul;63(1):32-8.
403. Buster JE, Kingsberg SA, Aguirre O, Brown C, Breaux JG, Buch A, Rodenberg CA, Wekselman K, Casson P. Testosterone patch for low sexual desire in surgically menopausal women: a randomized trial. *Obstet Gynecol*. 2005 May;105(5 Pt 1):944-52.
404. Flöter A, Nathorst-Böös J, Carlström K, von Schoultz B. Serum lipids in oophorectomized women during estrogen and testosterone replacement therapy. *Maturitas*. 2004 Feb 20;47(2):123-9.
405. Krug R, Mölle M, Dodt C, Fehm HL, Born J. Acute influences of estrogen and testosterone on divergent and convergent thinking in postmenopausal women. *Neuropsychopharmacology*. 2003 Aug;28(8):1538-45.
406. Flöter A, Nathorst-Böös J, Carlström K, von Schoultz B. Addition of testosterone to estrogen replacement therapy in oophorectomized women: effects on sexuality and well-being. *Climacteric*. 2002 Dec;5(4):357-65.

Women with HIV-AIDS

REFERENCES preceded by « 2/ »

407. Dolan Looby SE, Collins M, Lee H, Grinspoon S. Effects of long-term testosterone administration in HIV-infected women: a randomized, placebo-controlled trial. *AIDS*. 2009 May 15;23(8):951-9. .
408. Herbst KL, Calof OM, Hsia SH, Sinha-Hikim I, Woodhouse LJ, Buchanan TA, Bhasin S. Effects of transdermal testosterone administration on insulin sensitivity, fat mass and distribution, and markers of inflammation and thrombolysis in human immunodeficiency virus-infected women with mild to moderate weight loss. *Fertil Steril*. 2006 Jun;85(6):1794-802.
409. Choi HH, Gray PB, Storer TW, Calof OM, Woodhouse L, Singh AB, Padero C, Mac RP, Sinha-Hikim I, Shen R, Dzekov J, Dzekov C, Kushnir MM, Rockwood AL, Meikle AW, Lee ML, Hays RD, Bhasin S. Effects of testosterone replacement in human immunodeficiency virus-infected women with weight loss. *J Clin Endocrinol Metab*. 2005 Mar;90(3):1531-41.
410. Schurgin S, Dolan S, Perlstein A, Sullivan MP, Aliabadi N, Grinspoon S. Effects of testosterone administration on growth hormone pulse dynamics in human immunodeficiency virus-infected women. *J Clin Endocrinol Metab*. 2004 Jul;89(7):3290-7.
411. Miller K, Corcoran C, Armstrong C, Caramelli K, Anderson E, Cotton D, Basgoz N, Hirschhorn L, Tuomala R, Schoenfeld D, Daugherty C, Mazer N, Grinspoon S. Transdermal testosterone administration in women with acquired immunodeficiency syndrome wasting: a pilot study. *J Clin Endocrinol Metab*. 1998 Aug;83(8):2717-25.

Cardiac failure- postmenopausal women

412. Schwartz JB, Volterrani M, Caminiti G, Marazzi G, Fini M, Rosano GM, Iellamo F. Effects of testosterone on the Q-T interval in older men and older women with chronic heart failure. *Int J Androl*. 2011 Oct;34(5 Pt 2):e415-21.
413. Iellamo F, Volterrani M, Caminiti G, Karam R, Massaro R, Fini M, Collins P, Rosano GM. Testosterone therapy in women with chronic heart failure: a pilot double-blind, randomized, placebo-controlled study. *J Am Coll Cardiol*. 2010 Oct 12;56(16):1310-6.

Lichen sclerosus – topical vulvar testosterone treatment

414. Cattaneo A, Carli P, De Marco A, Sonni L, Bracco G, De Magnis A, Taddei GL. Testosterone maintenance therapy. Effects on vulvar lichen sclerosus treated with clobetasol propionate. *J Reprod Med*. 1996 Feb;41(2):99-102.
415. Sideri M, Origoni M, Spinaci L, Ferrari A. Topical testosterone in the treatment of vulvar lichen sclerosus. *Int J Gynaecol Obstet*. 1994 Jul;46(1):53-6.

Thyroid treatment: 158 placebo-controlled studies (130 in adults)

Adults

Healthy young adults: Thyroxine treatment

416. Münte TF, Radamm C, Johannes S, Brabant G. Alterations of cognitive functions induced by exogenous application of thyroid hormones in healthy men: a double-blind cross-over study using event-related brain potentials. *Thyroid*. 2001 Apr;11(4):385-91.

Healthy young adults: Triiodothyronine treatment

417. Wolthers T, Grøftne T, Møller N, Christiansen JS, Orskov H, Weeke J, Jørgensen JO. Calorigenic effects of growth hormone: the role of thyroid hormones. *J Clin Endocrinol Metab*. 1996 Apr;81(4):1416-9.

Healthy adults of all ages: Triiodothyronine treatment

418. Ginsberg AM, Clutter WE, Shah SD, Cryer PE. Triiodothyronine-induced thyrotoxicosis increases mononuclear leukocyte beta-adrenergic receptor density in man. *J Clin Invest*. 1981 Jun;67(6):1785-91.
419. Napoli R, Guardasole V, Angelini V, Zarra E, Terracciano D, D'Anna C, Matarazzo M, Oliviero U, Macchia V, Saccà L. Acute effects of triiodothyronine on endothelial function in human subjects. *J Clin Endocrinol Metab*. 2007 Jan;92(1):250-4.
420. Schmidt BM, Martin N, Georgens AC, Tillmann HC, Feuring M, Christ M, Wehling M. Nongenomic cardiovascular effects of triiodothyronine in euthyroid male volunteers. *J Clin Endocrinol Metab*. 2002 Apr;87(4):1681-6.
421. Wolthers T, Lechuga A, Grøfte T, Nørrelund H, Møller N, Christiansen JS, Jørgensen JO. Serum leptin concentrations during short-term administration of growth hormone and triiodothyronine in healthy adults: a randomised, double-blind placebo-controlled study. *Horm Metab Res*. 1999 Jan;31(1):37-40.

REFERENCES preceded by « 2/ »

Healthy elderly adults: Thyroxine treatment

422. WM. Pilot study on the assessment of the setpoint of the hypothalamus-pituitary-thyroid axis in healthy volunteers. *Eur J Endocrinol.* 2010 Feb;162(2):323-9

Healthy adults undergoing space flight stimulation: Triiodothyronine treatment

423. Smith SR, Lovejoy JC, Bray GA, Rood J, Most MM, Ryan DH. Triiodothyronine increases calcium loss in a bed rest antigravity model for space flight. *Metabolism.* 2008 Dec;57(12):1696-703.

424. Gouvier WD, Pinkston JB, Lovejoy JC, Smith SR, Bray GA, Santa Maria MP, Hammer JH, Hilsabeck RC, Smirolto B, Bentz B, Browndyke J. Neuropsychological and emotional changes during simulated microgravity: effects of triiodothyronine alendronate, and testosterone. *Arch Clin Neuropsychol.* 2004 Mar;19(2):153-63.

Healthy adults undergoing adaptation to extreme cold (Antarctic polar environment): Thyroxine treatment

425. Palinkas LA, Reedy KR, Shepanek M, Reeves D, Samuel Case H, Van Do N, Lester Reed H. A randomized placebo-controlled clinical trial of the effectiveness of thyroxine and triiodothyronine and short-term exposure to bright light in prevention of decrements in cognitive performance and mood during prolonged Antarctic residence. *Clin Endocrinol (Oxf).* 2010 Apr;72(4):543-50.

426. Palinkas LA, Reedy KR, Smith M, Anghel M, Steel GD, Reeves D, Shurtleff D, Case HS, Van Do N, Reed HL. Psychoneuroendocrine effects of combined thyroxine and triiodothyronine versus tyrosine during prolonged Antarctic residence. *Int J Circumpolar Health.* 2007 Dec;66(5):401-17.

427. Do NV, Mino L, Merriam GR, LeMar H, Case HS, Palinkas LA, Reedy K, Reed HL. Elevation in serum thyroglobulin during prolonged Antarctic residence: effect of thyroxine supplement in the polar 3,5,3'-triiodothyronine syndrome. *J Clin Endocrinol Metab.* 2004 Apr;89(4):1529-33.

428. Reed HL, Reedy KR, Palinkas LA, Van Do N, Finney NS, Case HS, LeMar HJ, Wright J, Thomas J. Impairment in cognitive and exercise performance during prolonged antarctic residence: effect of thyroxine supplementation in the polar triiodothyronine syndrome. *J Clin Endocrinol Metab.* 2001 Jan;86(1):110-6.

Healthy adults undergoing adaptation to extreme cold (Antarctic polar environment): Triiodothyronine treatment

429. D'Alesandro MM, Malik M, Reed HL, Homer LD. Changes in triiodothyronine (T3) mononuclear leukocyte receptor kinetics after T3 administration and multiple cold-air exposures. *Receptor.* 1994 Winter;4(4):259-68.

430. Reed HL, D'Alesandro MM, Kowalski KR, Homer LD. Multiple cold air exposures change oral triiodothyronine kinetics in normal men. *Am J Physiol.* 1992 Jul;263(1 Pt 1):E85-93.

431. Hesslink RL Jr, D'Alesandro MM, Armstrong DW 3rd, Reed HL. Human cold air habituation is independent of thyroxine and thyrotropin. *J Appl Physiol* (1985). 1992 Jun;72(6):2134-9.

Adults with a family history of thyroid disease and a serum TSH within or above the upper serum TSH limit: Thyroxine treatment

432. Abu-Helalah M, Law MR, Bestwick JP, Monson JP, Wald NJ. A randomized double-blind crossover trial to investigate the efficacy of screening for adult hypothyroidism. *J Med Screen.* 2010;17(4):164-9.

Adults of all ages with subclinical hypothyroidism (serum TSH above the upper reference limit and serum T4 within the reference range): Thyroxine treatment

433. Liu P, Liu R, Chen X, Chen Y, Wang D, Zhang F, Wang Y. Can levothyroxine treatment reduce urinary albumin excretion rate in patients with early type 2 diabetic nephropathy and subclinical hypothyroidism? A randomized double-blind and placebo-controlled study. *Curr Med Res Opin.* 2015 Dec;31(12):2233-40.

434. Dejanovic M, Ivetic V, Nestorovic V, Milanovic Z, Eric M. The value of P300 Event Related Potentials in the assessment of cognitive function in subclinical hypothyroidism. *Minerva Endocrinol.* 2015 Sep 3. [Epub ahead of print]

435. Ravanbod M1, Asadipooya K, Kalantarhormozi M, Nabipour I, Omrani GR Treatment of iron-deficiency anemia in patients with subclinical hypothyroidism. *Am J Med.* 2013 May;126(5):420-4.

436. Aghili R, Khamseh ME, Malek M, Hadian A, Baradaran HR, Najafi L, Emami Z. Changes of subtests of Wechsler Memory Scale and cognitive function in subjects with subclinical hypothyroidism following treatment with levothyroxine. *Arch Med Sci.* 2012 Dec 20;8(6):1096-101.

437. Martins RM, Fonseca RH, Duarte MM, Reuters VS, Ferreira MM, Almeida C, Buescu A, Teixeira Pde F, Vaisman M. Impact of subclinical hypothyroidism treatment in systolic and diastolic cardiac function. *Arq Bras Endocrinol Metabol.* 2011 Oct;55(7):460-7.

438. Parle J, Roberts L, Wilson S, Pattison H, Roalfe A, Haque MS, Heath C, Sheppard M, Franklyn J, Hobbs FD. A randomized controlled trial of the effect of thyroxine replacement on cognitive function in community-living elderly subjects with subclinical hypothyroidism: the Birmingham Elderly Thyroid study. *J Clin Endocrinol Metab.* 2010 Aug;95(8):3623-32.

REFERENCES preceded by « 2/ »

439. Nagasaki T, Inaba M, Yamada S, Shirakawa K, Nagata Y, Kumeda Y, Hiura Y, Tahara H, Ishimura E, Nishizawa Y. Decrease of brachial-ankle pulse wave velocity in female subclinical hypothyroid patients during normalization of thyroid function: a double-blind, placebo-controlled study. *Eur J Endocrinol.* 2009 Mar;160(3):409-15.
440. Mikhail GS, Alshammari SM, Alenezi MY, Mansour M, Khalil NA. Increased atherogenic low-density lipoprotein cholesterol in untreated subclinical hypothyroidism. *Endocr Pract.* 2008 Jul-Aug;14(5):570-5.
441. Teixeira Pde F, Reuters VS, Ferreira MM, Almeida CP, Reis FA, Buescu A, Costa AJ, Vaisman M. Lipid profile in different degrees of hypothyroidism and effects of levothyroxine replacement in mild thyroid failure. *Transl Res.* 2008 Apr;151(4):224-31.
442. Teixeira PF, Reuters VS, Ferreira MM, Almeida CP, Reis FA, Melo BA, Buescu A, Costa AJ, Vaisman M. Treatment of subclinical hypothyroidism reduces atherogenic lipid levels in a placebo-controlled double-blind clinical trial. *Horm Metab Res.* 2008 Jan;40(1):50-5.
443. Razvi S, Ingoe L, Keeka G, Oates C, McMillan C, Weaver JU. The beneficial effect of L-thyroxine on cardiovascular risk factors, endothelial function, and quality of life in subclinical hypothyroidism: randomized, crossover trial. *J Clin Endocrinol Metab.* 2007 May;92(5):1715-23.
444. Christ-Crain M, Meier C, Huber P, Zulewski H, Staub JJ, Müller B. Effect of restoration of euthyroidism on peripheral blood cells and erythropoietin in women with subclinical hypothyroidism. *Hormones (Athens).* 2003 Oct-Dec;2(4):237-42.
445. Meek S, Smallridge RC. Effect of thyroid hormone replacement on methionine-stimulated homocysteine levels in patients with subclinical hypothyroidism: a randomized, double-blind, placebo-controlled study. *Endocr Pract.* 2006 Sep-Oct;12(5):529-34.
446. Iqbal A, Jorde R, Figenschau Y. Serum lipid levels in relation to serum thyroid-stimulating hormone and the effect of thyroxine treatment on serum lipid levels in subjects with subclinical hypothyroidism: the Tromsø Study. *J Intern Med.* 2006 Jul;260(1):53-61.
447. Jorde R, Waterloo K, Storhaug H, Nyrnes A, Sundsfjord J, Jenssen TG. Neuropsychological function and symptoms in subjects with subclinical hypothyroidism and the effect of thyroxine treatment. *J Clin Endocrinol Metab.* 2006 Jan;91(1):145-53.
448. Caraccio N, Natali A, Sironi A, Baldi S, Frascerra S, Dardano A, Monzani F, Ferrannini E. Muscle metabolism and exercise tolerance in subclinical hypothyroidism: a controlled trial of levothyroxine. *J Clin Endocrinol Metab.* 2005 Jul;90(7):4057-62.
449. Meier C, Beat M, Guglielmetti M, Christ-Crain M, Staub JJ, Kraenzlin M. Restoration of euthyroidism accelerates bone turnover in patients with subclinical hypothyroidism: a randomized controlled trial. *Osteoporos Int.* 2004 Mar;15(3):209-16.
450. Meier Cr C, Christ-Crain M, Guglielmetti M, Huber P, Staub JJ, Müller B. Prolactin dysregulation in women with subclinical hypothyroidism: effect of levothyroxine replacement therapy. *Thyroid.* 2003 Oct;13(10):979-85.
451. Christ-Crain M, Meier C, Guglielmetti M, Huber PR, Riesen W, Staub JJ, Müller B. Elevated C-reactive protein and homocysteine values: cardiovascular risk factors in hypothyroidism? A cross-sectional and a double-blind, placebo-controlled trial. *Atherosclerosis.* 2003 Feb;166(2):379-86.
452. Jensovsky J, Ruzicka E, Spackova N, Hejdukova B. Changes of event related potential and cognitive processes in patients with subclinical hypothyroidism after thyroxine treatment. *Endocr Regul.* 2002 Sep;36(3):115-22.
453. Kong WM, Sheikh MH, Lumb PJ, Naoumova RP, Freedman DB, Crook M, Doré CJ, Finer N. A 6-month randomized trial of thyroxine treatment in women with mild subclinical hypothyroidism. *Am J Med.* 2002 Apr 1;112(5):348-54. Erratum in: *Am J Med* 2002 Oct 1;113(5):442.
454. Meier C, Staub JJ, Roth CB, Guglielmetti M, Kunz M, Miserez AR, Drewe J, Huber P, Herzog R, Müller B. TSH-controlled L-thyroxine therapy reduces cholesterol levels and clinical symptoms in subclinical hypothyroidism: a double blind, placebo-controlled trial (Basel Thyroid Study). *J Clin Endocrinol Metab.* 2001 Oct;86(10):4860-6.
455. Jaeschke R, Guyatt G, Gerstein H, Patterson C, Molloy W, Cook D, Harper S, Griffith L, Carbotte R. Does treatment with L-thyroxine influence health status in middle-aged and older adults with subclinical hypothyroidism? *J Gen Intern Med.* 1996 Dec;11(12):744-9.
456. Nyström E, Lundberg PA, Lindstedt G. Rebound increase in serum thyrotropin, anti-'microsomal' antibodies and thyroglobulin after discontinuation of L-thyroxine. *J Intern Med.* 1990 Nov;228(5):497-501.

Adults of all ages with overt hypothyroidism: Thyroxine treatment

457. Niknam N, Khalili N, Khosravi E, Nourbakhsh M. Endothelial dysfunction in patients with subclinical hypothyroidism and the effects of treatment with levothyroxine. *Adv Biomed Res.* 2016 Mar 16;5:38.
458. Ala S, Akha O, Kashi Z, Asgari H, Bahar A, Sasanpour N. Dose administration time from before breakfast to before dinner affect thyroid hormone levels? *Caspian J Intern Med.* 2015 Summer;6(3):134-40.
459. Cappelli C, Pirola I, Daffini L, Formenti A, Iacobello C, Cristiano A, Gandossi E, Agabiti Rosei E, Castellano M. A Double-Blind Placebo-Controlled Trial of Liquid Thyroxine Ingested at Breakfast: Results of the TICO Study. *Thyroid.* 2016 Feb;26(2):197-202.
460. Yazici M, Gorgulu S, Sertbas Y, Erbilin E, Albayrak S, Yildiz O, Uyan C. Effects of thyroxin therapy on cardiac function in patients with subclinical hypothyroidism: index of myocardial performance in the evaluation of left ventricular function. *Int J Cardiol.* 2004 Jun;95(2-3):135-43.

REFERENCES preceded by « 2/ »

461. ni F, Caraccio N, Kozàková M, Dardano A, Vittone F, Viridis A, Taddei S, Palombo C, Ferrannini E. Effect of levothyroxine replacement on lipid profile and intima-media thickness in subclinical hypothyroidism: a double-blind, placebo-controlled study. *J Clin Endocrinol Metab.* 2004 May;89(5):2099-106.
462. Caraccio N, Ferrannini E, Monzani F. Lipoprotein profile in subclinical hypothyroidism: response to levothyroxine replacement, a randomized placebo-controlled study. *J Clin Endocrinol Metab.* 2002 Apr;87(4):1533-8.
463. Monzani F, Di Bello V, Caraccio N, Bertini A, Giorgi D, Giusti C, Ferrannini E. Effect of levothyroxine on cardiac function and structure in subclinical hypothyroidism: a double blind, placebo-controlled study. *J Clin Endocrinol Metab.* 2001 Mar;86(3):1110-5.
464. Nyström E, Caidahl K, Fager G, Wikkelsö C, Lundberg PA, Lindstedt G. A double-blind cross-over 12-month study of L-thyroxine treatment of women with 'subclinical' hypothyroidism. *Clin Endocrinol (Oxf).* 1988 Jul;29(1):63-75.
465. Cooper DS, Halpern R, Wood LC, Levin AA, Ridgway EC. L-Thyroxine therapy in subclinical hypothyroidism. A double-blind, placebo-controlled trial. *Ann Intern Med.* 1984 Jul;101(1):18-24

Adults of all ages with overt hypothyroidism: Thyroxine or thyroxine and triiodothyronine treatment

466. Slawik M, Klawitter B, Meiser E, Schories M, Zwermann O, Borm K, Peper M, Lubrich B, Hug MJ, Nauck M, Olschewski M, Beuschlein F, Reincke M. Thyroid hormone replacement for central hypothyroidism: a randomized controlled trial comparing two doses of thyroxine (T4) with a combination of T4 and triiodothyronine. *J Clin Endocrinol Metab.* 2007 Nov;92(11):4115-22.
467. Joffe RT, Sawka AM, Marriott MJ, MacQueen GM, Gemstein HC. Does substitution of T4 with T3 plus T4 for T4 replacement improve depressive symptoms in patients with hypothyroidism? *Ann N Y Acad Sci.* 2004 Dec;1032:287-8.
468. Saravanan P, Simmons DJ, Greenwood R, Peters TJ, Dayan CM. Partial substitution of thyroxine (T4) with triiodothyronine in patients on T4 replacement therapy: results of a large community-based randomized controlled trial. *J Clin Endocrinol Metab.* 2005 Feb;90(2):805-12.
469. Crain M, Morgenthaler NG, Meier C, Müller C, Nussbaumer C, Bergmann A, Staub JJ, Müller B. Pro-A-type and N-terminal pro-B-type natriuretic peptides in different thyroid function states. *Swiss Med Wkly.* 2005 Sep 17;135(37-38):549-54.
470. Sawka AM, Gerstein HC, Marriott MJ, MacQueen GM, Joffe RT. Does a combination regimen of thyroxine (T4) and 3,5,3'-triiodothyronine improve depressive symptoms better than T4 alone in patients with hypothyroidism? Results of a double-blind, randomized, controlled trial. *J Clin Endocrinol Metab.* 2003 Oct;88(10):4551-5.

Patients with thyroid nodules: Thyroxine treatment

471. Grussendorf M, Reiners C, Paschke R, Wegscheider K; LISA Investigators.. Reduction of thyroid nodule volume by levothyroxine and iodine alone and in combination: a randomized, placebo-controlled trial. *J Clin Endocrinol Metab.* 2011 Sep;96(9):2786-95.
472. Tsai CC, Pei D, Hung YJ, Wang TF, Tsai WC, Yao CY, Hsieh MC, Kuo SW. The effect of thyroxine-suppressive therapy in patients with solitary non-toxic thyroid nodules -- a randomised, double-blind, placebo-controlled study. *Int J Clin Pract.* 2006 Jan;60(1):23-6.
473. Larijani B, Pajouhi M, Bastanhagh MH, Sadjadi A, Sedighi N, Eshraghian MR. Evaluation of suppressive therapy for cold thyroid nodules with levothyroxine: double-blind placebo-controlled clinical trial. *Endocr Pract.* 1999 Sep-Oct;5(5):251-6.
474. Wémeau JL, Caron P, Schwartz C, Schlienger JL, Orgiazzi J, Cousty C, Vlaeminck-Guillem V. Effects of thyroid-stimulating hormone suppression with levothyroxine in reducing the volume of solitary thyroid nodules and improving extranodular nonpalpable changes: a randomized, double-blind, placebo-controlled trial by the French Thyroid Research Group. *J Clin Endocrinol Metab.* 2002 Nov;87(11):4928-34.
475. Koc M, Ersoz HO, Akpınar I, Gogas-Yavuz D, Deyneli O, Akalin S. Effect of low- and high-dose levothyroxine on thyroid nodule volume: a crossover placebo-controlled trial. *Clin Endocrinol (Oxf).* 2002 Nov;57(5):621-8.
476. Wémeau JL, Cousty C, Vlaeminck V. Suppressive hormone therapy for thyroid nodules. Prospective evaluation. Preliminary results] *Ann Endocrinol (Paris).* 2000 May;61(2):119-24.
477. Zelmanovitz F, Genro S, Gross JL. Suppressive therapy with levothyroxine for solitary thyroid nodules: a double-blind controlled clinical study and cumulative meta-analyses. *J Clin Endocrinol Metab.* 1998 Nov;83(11):3881-5.
478. Papini E, Bacci V, Panunzi C, Pacella CM, Fabbri R, Bizzarri G, Petrucci L, Giammarco V, La Medica P, Masala M, et al. A prospective randomized trial of levothyroxine suppressive therapy for solitary thyroid nodules. *Clin Endocrinol (Oxf).* 1993 May;38(5):507-13.
479. Gharib H, James EM, Charboneau JW, Naessens JM, Offord KP, Gorman CA. Suppressive therapy with levothyroxine for solitary thyroid nodules. A double-blind controlled clinical study. *N Engl J Med.* 1987 Jul 9;317(2):70-5
480. McCowen KD, Reed JW, Fariss BL. The role of thyroid therapy in patients with thyroid cysts. *Am J Med.* 1980 Jun;68(6):853-5.

Patients with endemic goiter: Thyroxine treatment

REFERENCES preceded by « 2/ »

481. Kahaly GJ, Dienes HP, Beyer J, Hommel G. Iodide induces thyroid autoimmunity in patients with endemic goitre: a randomised, double-blind, placebo-controlled trial. *Eur J Endocrinol*. 1998 Sep;139(3):290-7.
482. Koutras DA, Karaiskos KS, Piperigos GD, Kitsopanides J, Boukis MA, Makriyannis D, Souvatzoglou A, Sfontouris J, Evangelopoulou K, Mouloupoulos SD, et al. Treatment of endemic goitre with iodine and thyroid hormones, alone or in combination. (Preliminary report). *Endocrinol Exp*. 1986 Mar;20(1):57-65
483. Hintze G, Emrich D, Köbberling J. Therapy of endemic goitre: controlled study on the effect of iodine and thyroxine. *Horm Metab Res*. 1985 Jul;17(7):362-5.

Patients after thyroidectomy: Thyroxine treatment

484. Berglund J, Aspelin P, Bondeson AG, Bondeson L, Christensen SB, Ekberg O, Nilsson P. Rapid increase in volume of the remnant after hemithyroidectomy does not correlate with serum concentration of thyroid stimulating hormone. *Eur J Surg*. 1998 Apr;164(4):257-62.

Adults with hypothyroid symptoms but thyroid tests within reference range: Thyroxine treatment

485. Pollock MA, Sturrock A, Marshall K, Davidson KM, Kelly CJ, McMahon AD, McLaren EH. Thyroxine treatment in patients with symptoms of hypothyroidism but thyroid function tests within the reference range: randomised double blind placebo controlled crossover trial. *BMJ*. 2001 Oct 20;323(7318):891-5.

Adults during or after hyperthyroidism for Graves disease: Thyroxine treatment

486. Glinoe D, de Nayer P, Bex M; Belgian Collaborative Study Group on Graves' Disease.. Effects of l-thyroxine administration, TSH-receptor antibodies and smoking on the risk of recurrence in Graves' hyperthyroidism treated with antithyroid drugs: a double-blind prospective randomized study. *Eur J Endocrinol*. 2001 May;144(5):475-83.
487. Hashizume K, Ichikawa K, Sakurai A, Suzuki S, Takeda T, Kobayashi M, Miyamoto T, Arai M, Nagasawa T. Administration of thyroxine in treated Graves' disease. Effects on the level of antibodies to thyroid-stimulating hormone receptors and on the risk of recurrence of hyperthyroidism. *N Engl J Med*. 1991 Apr 4;324(14):947-53.

Adults with obesity: Triiodothyronine treatment

488. Rozen R, Abraham G, Falcou R, Apfelbaum M. Effects of a 'physiological' dose of triiodothyronine on obese subjects during a protein-sparing diet. *Int J Obes*. 1986;10(4):303-12.
489. Pasquali R, Baraldi G, Biso P, Piazzini S, Patrono D, Capelli M, Melchionda N. Effect of 'physiological' doses of triiodothyronine replacement on the hormonal and metabolic adaptation to short-term semistarvation and to low-calorie diet in obese patients. *Clin Endocrinol (Oxf)*. 1984 Oct;21(4):357-67
490. Moore R, Grant AM, Howard AN, Mills IH. Treatment of obesity with triiodothyronine and a very-low-calorie liquid formula diet. *Lancet*. 1980 Feb 2;1(8162):223-6.
491. González Barranco J, Rull JA, Lozano Castañeda O. L-thyroxine propylhexedrine in the treatment of obesity. Crossed double blind study. *Prensa Med Mex*. 1974 May-Jun;39(5-6):298-9.
492. Goodman NG. Triiodothyronine and placebo in the treatment of obesity. A study of fifty-five patients. *Med Ann Dist Columbia*. 1969 Dec;38(12):658-62 passim

Adults with Raynaud syndrome: Triiodothyronine treatment

493. Dessein PH, Morrison RC, Lamparelli RD, van der Merwe CA. Triiodothyronine treatment for Raynaud's phenomenon: a controlled trial. *J Rheumatol*. 1990 Aug;17(8):1025-8.

Adults with heart failure: Triiodothyronine treatment

494. Holmager P, Schmidt U, Mark P, Andersen U, Dominguez H, Raymond I, Zerahn B, Nygaard B, Kistorp C, Faber J. Long-term L-Triiodothyronine (T3) treatment in stable systolic heart failure patients: a randomised, double-blind, cross-over, placebo-controlled intervention study. *Clin Endocrinol (Oxf)*. 2015 Dec;83(6):931-7.
495. Pingitore A, Galli E, Barison A, Iervasi A, Scarlattini M, Nucci D, L'abbate A, Mariotti R, Iervasi G. Acute effects of triiodothyronine (T3) replacement therapy in patients with chronic heart failure and low-T3 syndrome: a randomized, placebo-controlled study. *J Clin Endocrinol Metab*. 2008 Apr;93(4):1351-8.

Adults with cardiac surgery Triiodothyronine treatment

496. Choi YS, Shim JK, Song JW, Song Y, Yang SY, Kwak YL. Efficacy of perioperative oral triiodothyronine replacement therapy in patients undergoing off-pump coronary artery bypass grafting. *J Cardiothorac Vasc Anesth*. 2013 Dec;27(6):1218-23.
497. Choi YS, Kwak YL, Kim JC, Chun DH, Hong SW, Shim JK. Peri-operative oral triiodothyronine replacement therapy to prevent postoperative low triiodothyronine state following valvular heart surgery. *Anaesthesia*. 2009 Aug;64(8):871-7.
498. Magalhães AP, Gus M, Silva LB, Schaan BD. Oral triiodothyronine for the prevention of thyroid hormone reduction in adult valvular cardiac surgery. *Braz J Med Biol Res*. 2006 Jul;39(7):969-78.

REFERENCES preceded by « 2/ »

499. Sirlak M, Yazicioglu L, Inan MB, Eryilmaz S, Tasoş R, Aral A, Ozyurda U. Oral thyroid hormone pretreatment in left ventricular dysfunction. *Eur J Cardiothorac Surg*. 2004 Oct;26(4):720-5.
500. Güden M, Akpınar B, Sağbaşı E, Sanisođlu I, Cakali E, Bayindir O. Effects of intravenous triiodothyronine during coronary artery bypass surgery. *Asian Cardiovasc Thorac Ann*. 2002 Sep;10(3):219-22.
501. Mullis-Jansson SL, Argenziano M, Corwin S, Homma S, Weinberg AD, Williams M, Rose EA, Smith CR. A randomized double-blind study of the effect of triiodothyronine on cardiac function and morbidity after coronary bypass surgery. *J Thorac Cardiovasc Surg*. 1999 Jun;117(6):1128-34.
502. Klemperer JD, Klein IL, Ojamaa K, Helm RE, Gomez M, Isom OW, Krieger KH. Triiodothyronine therapy lowers the incidence of atrial fibrillation after cardiac operations. *Ann Thorac Surg*. 1996 May;61(5):1323-7; discussion 1328-9.
503. Bennett-Guerrero E, Jimenez JL, White WD, D'Amico EB, Baldwin BI, Schwinn DA. Cardiovascular effects of intravenous triiodothyronine in patients undergoing coronary artery bypass graft surgery. A randomized, double-blind, placebo-controlled trial. Duke T3 study group. *JAMA*. 1996 Mar 6;275(9):687-92.
504. Klemperer JD, Klein I, Gomez M, Helm RE, Ojamaa K, Thomas SJ, Isom OW, Krieger K. Thyroid hormone treatment after coronary-artery bypass surgery. *N Engl J Med*. 1995 Dec 7;333(23):1522-7.
505. Vavouranakis I, Sanoudos G, Manios A, Kalogeropoulou K, Sitaras K, Kokkinos C. Triiodothyronine administration in coronary artery bypass surgery: effect on hemodynamics. *J Cardiovasc Surg (Torino)*. 1994 Oct;35(5):383-9.
506. Teiger E, Menasché P, Mansier P, Chevalier B, Lajeunie E, Bloch G, Piwnica A. Triiodothyronine therapy in open-heart surgery: from hope to disappointment. *Eur Heart J*. 1993 May;14(5):629-33. PubMed PMID: 8389710.
507. Novitzky D, Cooper DK, Barton CI, Greer A, Chaffin J, Grim J, Zuhdi N. Triiodothyronine as an inotropic agent after open heart surgery. *J Thorac Cardiovasc Surg*. 1989 Nov;98(5 Pt 2):972-7; discussion 977-8.

Patients with asthma: Triiodothyronine treatment

508. Hollingsworth HM, Pratter MR, Dubois JM, Braverman LE, Irwin RS. Effect of triiodothyronine-induced thyrotoxicosis on airway hyperresponsiveness. *J Appl Physiol* (1985). 1991 Aug;71(2):438-44.

Adults with kidney failure and/oronhemodialysis: Thyroxine treatment

509. Acker CG, Singh AR, Flick RP, Bernardini J, Greenberg A, Johnson JP. A trial of thyroxine in acute renal failure. *Kidney Int*. 2000 Jan;57(1):293-8.
510. Bommer C, Werle E, Walter-Sack I, Keller C, Gehlen F, Wanner C, Nauck M, März W, Wieland H, Bommer J. D-thyroxine reduces lipoprotein(a) serum concentration in dialysis patients. *J Am Soc Nephrol*. 1998 Jan;9(1):90-6

Patients with burn injury: Triiodothyronine treatment

511. Becker RA, Vaughan GM, Ziegler MG, Seraile LG, Goldfarb IW, Mansour EH, McManus WF, Pruitt BA Jr, Mason AD Jr. Hypermetabolic low triiodothyronine syndrome of burn injury. *Crit Care Med*. 1982 Dec;10(12):870-5

Female patients with premenstrual syndrome: Triiodothyronine treatment

512. Schmidt PJ, Grover GN, Roy-Byrne PP, Rubinow DR. Thyroid function in women with premenstrual syndrome. *J Clin Endocrinol Metab*. 1993 Mar;76(3):671-4.
513. Nikolai TF, Mulligan GM, Gribble RK, Harkins PG, Meier PR, Roberts RC. Thyroid function and treatment in premenstrual syndrome. *J Clin Endocrinol Metab*. 1990 Apr;70(4):1108-13.

Female patients with infertility and with subclinical hypothyroidism or thyroid antibody positivity undergoing In vitro fertilization: thyroxine treatment

514. Abdel Rahman AH1, Aly Abbassy H, Abbassy AA. Improved in vitro fertilization outcomes after treatment of subclinical hypothyroidism in infertile women. *Endocr Pract*. 2010 Sep-Oct;16(5):792-7.
515. Negro R, Mangieri T, Coppola L, Presicce G, Casavola EC, Gismondi R, Locorotondo G, Caroli P, Pezzarossa A, Dazzi D, Hassan H. Levothyroxine treatment in thyroid peroxidase antibody-positive women undergoing assisted reproduction technologies: a prospective study. *Hum Reprod*. 2005 Jun;20(6):1529-33.

Female patients with infertility: thyroid extract treatment

516. Naficy H, Behjatnia Y. The effect of thyroid extract on luteal phase deficiency. *Acta Med Iran*. 1975;18(1-2):55-60.

Brain dead organ donors: Triiodothyronine treatment

517. Sharpe MD, van Rassel B, Haddara W. Oral and intravenous thyroxine (T4) achieve comparable serum levels for hormonal resuscitation protocol in organ donors: a randomized double-blinded study. *Can J Anaesth*. 2013 Oct;60(10):998-1002.

REFERENCES preceded by « 2/ »

518. James SR, Ranasinghe AM, Venkateswaran R, McCabe CJ, Franklyn JA, Bonser RS. The effects of acute triiodothyronine therapy on myocardial gene expression in brain stem dead cardiac donors. *J Clin Endocrinol Metab.* 2010 Mar;95(3):1338-43.
519. Goarin JP, Cohen S, Riou B, Jacquens Y, Guesde R, Le Bret F, Aurengo A, Coriat P. The effects of triiodothyronine on hemodynamic status and cardiac function in potential heart donors. *Anesth Analg.* 1996 Jul;83(1):41-7.
520. Mariot J, Jacob F, Voltz C, Perrier JF, Strub P. Value of hormonal treatment with triiodothyronine and cortisone in brain dead patients. *Ann Fr Anesth Reanim.* 1991;10(4):321-8

Patients on anti-epileptics: Thyroxine treatment

521. Tiihonen M, Liewendahl K, Waltimo O, Ojala M, Välimäki M. Thyroid status of patients receiving long-term anticonvulsant therapy assessed by peripheral parameters: a placebo-controlled thyroxine therapy trial. *Epilepsia.* 1995 Nov;36(11):1118-25.
522. Angervo M, Tiihonen M, Leinonen P, Välimäki M, Seppälä M. Thyroxine treatment increases circulating levels of insulin-like growth factor binding protein-1: a placebo-controlled study. *Clin Endocrinol (Oxf).* 1993 May;38(5):547-51.

Elderly patients with dementia: Triiodothyronine treatment

523. Mori T, Inoue D, Kosugi S, Miyamoto M, Nishino K, Sagawa H, Akamizu T, Yokota T, Nakamura H, Namikawa M, et al. Effects of low dose L-triiodothyronine administration on mental, behavioural and thyroid states in elderly subjects. *Endocrinol Jpn.* 1988 Aug;35(4):585-92.

Patients with depression and subclinical hypothyroidism: Thyroxine treatment

524. Najafi L, Malek M, Hadian A, Ebrahim Valojerdi A, Khamseh ME, Aghili R. Depressive symptoms in patients with subclinical hypothyroidism--the effect of treatment with levothyroxine: a double-blind randomized clinical trial. *Endocr Res.* 2015;40(3):121-6.
525. Reuters VS, Almeida Cde P, Teixeira Pde F, Vigário Pdos S, Ferreira MM, Castro CL, Brasil MA, Costa AJ, Buescu A, Vaisman M. Effects of subclinical hypothyroidism treatment on psychiatric symptoms, muscular complaints, and quality of life. *Arq Bras Endocrinol Metabol.* 2012 Mar;56(2):128-36.

Patients with depression: Triiodothyronine treatment

526. Loosen PT, Garbutt JC, Dew B, Prange AJ. Pituitary sensitivity to thyroid hormones in depressed patients. *Pharmacopsychiatry.* 1987 May;20(3):85-9

Female patients with positive thyroid antibodies: thyroxine treatment to prevent postnatal depression

527. Harris B, Oretti R, Lazarus J, Parkes A, John R, Richards C, Newcombe R, Hall R. Randomised trial of thyroxine to prevent postnatal depression in thyroid-antibody-positive women. *Br J Psychiatry.* 2002 Apr;180:327-30.

Patients with depression on antidepressants: Addition of triiodothyronine treatment

528. Abulseoud OA, Gitlin M, Altshuler L, Frye MA. Baseline thyroid indices and the subsequent response to citalopram treatment, a pilot study. *Brain Behav.* 2013 Mar;3(2):89-94.
529. Cooper-Kazaz R, van der Deure WM, Medici M, Visser TJ, Alkelai A, Glaser B, Peeters RP, Lerer B. Preliminary evidence that a functional polymorphism in type 1 deiodinase is associated with enhanced potentiation of the antidepressant effect of sertraline by triiodothyronine. *J Affect Disord.* 2009 Jul;116(1-2):113-6.
530. Posternak M, Novak S, Stern R, Hennessey J, Joffe R, Prange A Jr, Zimmerman M. A pilot effectiveness study: placebo-controlled trial of adjunctive L-triiodothyronine (T3) used to accelerate and potentiate the antidepressant response. *Int J Neuropsychopharmacol.* 2008 Feb;11(1):15-25.
531. Joffe RT, Sokolov ST, Levitt AJ. Lithium and triiodothyronine augmentation of antidepressants. *Can J Psychiatry.* 2006 Oct;51(12):791-3.
532. Appelhof BC, Brouwer JP, van Dyck R, Fliers E, Hoogendijk WJ, Huyser J, Schene AH, Tijssen JG, Wiersinga WM. Triiodothyronine addition to paroxetine in the treatment of major depressive disorder. *J Clin Endocrinol Metab.* 2004 Dec;89(12):6271-6.
533. Joffe RT, Singer W, Levitt AJ, MacDonald C. A placebo-controlled comparison of lithium and triiodothyronine augmentation of tricyclic antidepressants in unipolar refractory depression. *Arch Gen Psychiatry.* 1993 May;50(5):387-93.
534. Souche A, Baumann P, Koeb L, Themoz P, Azorin JM, Dufour H. [Treatment of depression by a combination of clomipramine and triiodothyronine]. *Encephale.* 1991 Jan-Feb;17(1):37-42.
535. Garlow SJ, Dunlop BW, Ninan PT, Nemeroff CB. The combination of triiodothyronine (T3) and sertraline is not superior to sertraline monotherapy in the treatment of major depressive disorder. *J Psychiatr Res.* 2012 Nov;46(11):1406-13.

Patients on antidepressant therapy + T3 or thyroxine

REFERENCES preceded by « 2/ »

536. Levitt AJ, Wesson VA, Joffe RT. Impact of suppression of thyroxine on folate status during acute antidepressant therapy. *Psychiatry Res.* 1998 Jun 15;79(2):123-9.

Patients with schizophrenia: Triiodothyronine treatment

537. Steibliene V, Bunevicius A, Savickas A, Prange AJ Jr, Nemeroff CB, Bunevicius R. Triiodothyronine accelerates and enhances the antipsychotic effect of risperidone in acute schizophrenia. *J Psychiatr Res.* 2016 Feb;73:9-16.

Patients with alopecia areata: Topical triiodothyronine

538. Nasiri S, Haghpanah V, Taheri E, Heshmat R, Larijani B, Saeedi M. Hair regrowth with topical triiodothyronine ointment in patients with alopecia areata: a double-blind, randomized pilot clinical trial of efficacy. *J Eur Acad Dermatol Venereol.* 2012 May;26(5):654-6.

Thyroid hormone analog D-thyroxine

Adults with heart failure: Thyroxine treatment

539. Moruzzi P, Doria E, Agostoni PG. Medium-term effectiveness of L-thyroxine treatment in idiopathic dilated cardiomyopathy. *Am J Med.* 1996 Nov;101(5):461-7.
540. Moruzzi P, Doria E, Agostoni PG, Capacchione V, Sganzerla P. Usefulness of L-thyroxine to improve cardiac and exercise performance in idiopathic dilated cardiomyopathy. *Am J Cardiol.* 1994 Feb 15;73(5):374-8.

Adults with dyslipidemia: D-thyroxine treatment

541. Hempel RD, Müller G, Burchardt U. D-thyroxin in the therapy of type IIa and IIb hyperlipoproteinemias. *Z Gesamte Inn Med.* 1977 Jun 1;32(11):suppl 175-6.
542. Schwartzkopff W, Russ E. Comparative studies of the lipid-lowering activity of etiroxate hydrochloride and dextrothyroxine. *MMW Munch Med Wochenschr.* 1975 May 9;117(19):827-30.

Adults with coronary heart disease: D-thyroxine treatment

543. Ramírez EA, García Pont PH, Alvarado Norat F. A 5 year double blind controlled clinical trial of D-thyroxine on euthyroid coronary subjects. Final report. *Bol Asoc Med P R.* 1972 Apr;64(4):64-73.

Adults with hemorrhagic stroke: D-thyroxine treatment

544. Ma J, Yang X, Yin H, Wang Y, Chen H, Liu C, Han G, Gao F. Effect of thyroid hormone replacement therapy on cognition in long-term survivors of aneurysmal subarachnoid hemorrhage. *Exp Ther Med.* 2015 Jul;10(1):369-373.

Adults with scleroderma: D-thyroxine treatment (not efficient)

545. Winkelmann RK, Kierland RR, Perry HO, Muller SA. Treatment of scleroderma with sodium dextrothyroxine. *Arch Dermatol.* 1965 Jan;91:66-9.

Children

Fanconi anemia syndrome- children: Thyroxine treatment for growth stimulation

546. Eyal O, Blum S, Mueller R, Smith FO, Rose SR. Improved growth velocity during thyroid hormone therapy in children with Fanconi anemia and borderline thyroid function. *Pediatr Blood Cancer.* 2008 Nov;51(5):652-6.

Attention deficit disorder – children: Triiodothyronine treatment

547. Weiss RE, Stein MA, Refetoff S. Behavioral effects of liothyronine (L-T3) in children with attention deficit hyperactivity disorder in the presence and absence of resistance to thyroid hormone. *Thyroid.* 1997 Jun;7(3):389-93.

Autism – children: Triiodothyronine treatment

548. Campbell M, Small AM, Hollander CS, Korein J, Cohen IL, Kalmijn M, Ferris S. A controlled crossover study of triiodothyronine in autistic children. *J Autism Child Schizophr.* 1978 Dec;8(4):371-81.

Down syndrome - children

549. Marchal JP, Maurice-Stam H, Ikelaar NA, Klouwer FC, Verhorstert KW, Witteveen ME, Houtzager BA, Grootenhuys MA, van Trotsenburg AS. Effects of early thyroxine treatment on development and growth at age

REFERENCES preceded by « 2/ »

- 10.7 years: follow-up of a randomized placebo-controlled trial in children with Down's syndrome. *J Clin Endocrinol Metab.* 2014 Dec;99(12):E2722-9.
550. van Trotsenburg AS, Smit BJ, Koelman JH, Dekker-van der Sloot M, Ridder JC, Tijssen JG, de Vijlder JJ, Vulsma T. Median nerve conduction velocity and central conduction time measured with somatosensory evoked potentials in thyroxine-treated infants with Down syndrome. *Pediatrics.* 2006 Sep;118(3):e825-32.
551. van Trotsenburg AS, Kempers MJ, Ender E, Tijssen JG, de Vijlder JJ, Vulsma T. Trisomy 21 causes persistent congenital hypothyroidism presumably of thyroidal origin. *Thyroid.* 2006 Jul;16(7):671-80.
552. van Trotsenburg AS, Vulsma T, van Rozenburg-Marres SL, van Baar AL, Ridder JC, Heymans HS, Tijssen JG, de Vijlder JJ. The effect of thyroxine treatment started in the neonatal period on development and growth of two-year-old Down syndrome children: a randomized clinical trial. *J Clin Endocrinol Metab.* 2005 Jun;90(6):3304-11.
553. Tirosh E, Taub Y, Scher A, Jaffe M, Hochberg Z. Short-term efficacy of thyroid hormone supplementation for patients with Down syndrome and low-borderline thyroid function. *Am J Ment Retard.* 1989 May;93(6):652-6.

Pre-term infants: Thyroxine treatment

554. van Wassenaer-Leemhuis A, Ares S, Golombek S, Kok J, Paneth N, Kase J, LaGamma EF. Thyroid hormone supplementation in preterm infants born before 28 weeks gestational age and neurodevelopmental outcome at age 36 months. *Thyroid.* 2014 Jul;24(7):1162-9.
555. Ng SM, Tumer MA, Gamble C, Didi M, Victor S, Atkinson J, Sluming V, Parkes LM, Tietze A, Abernethy LJ, Weindling AM. Effect of thyroxine on brain microstructure in extremely premature babies: magnetic resonance imaging findings in the TIPIT study. *Pediatr Radiol.* 2014 Aug;44(8):987-96.
556. van Wassenaer AG, Briët JM, van Baar A, Smit BJ, Tamminga P, de Vijlder JJ, Kok JH. Free thyroxine levels during the first weeks of life and neurodevelopmental outcome until the age of 5 years in very preterm infants. *Pediatrics.* 2002 Sep;110(3):534-9.
557. Briët JM, van Wassenaer AG, Dekker FW, de Vijlder JJ, van Baar A, Kok JH. Neonatal thyroxine supplementation in very preterm children: developmental outcome evaluated at early school age. *Pediatrics.* 2001 Apr;107(4):712-8.
558. Smith LM, Leake RD, Berman N, Villanueva S, Brasel JA. Postnatal thyroxine supplementation in infants less than 32 weeks' gestation: effects on pulmonary morbidity. *J Perinatol.* 2000 Oct-Nov;20(7):427-31.
559. Briët JM, van Wassenaer AG, van Baar A, Dekker FW, Kok JH. Evaluation of the effect of thyroxine supplementation on behavioural outcome in very preterm infants. *Dev Med Child Neurol.* 1999 Feb;41(2):87-93.
560. Van Wassenaer AG, Kok JH, Briët JM, Pijning AM, de Vijlder JJ. Thyroid function in very preterm newborns: possible implications. *Thyroid.* 1999 Jan;9(1):85-91.
561. van Wassenaer AG, Kok JH, Dekker FW, Ender E, de Vijlder JJ. Thyroxine administration to infants of less than 30 weeks gestational age decreases plasma tri-iodothyronine concentrations. *Eur J Endocrinol.* 1998 Nov;139(5):508-15.
562. Smit BJ, Kok JH, de Vries LS, van Wassenaer AG, Dekker FW, Ongerboer de Visser BW. Somatosensory evoked potentials in very preterm infants in relation to L-thyroxine supplementation. *Pediatrics.* 1998 May;101(5):865-9.
563. Smit BJ, Kok JH, de Vries LS, van Wassenaer AG, Dekker FW, Ongerboer de Visser BW. Motor nerve conduction velocity in very preterm infants in relation to L-thyroxine supplementation. *J Pediatr.* 1998 Jan;132(1):64-9.
564. van Wassenaer AG, Kok JH, de Vijlder JJ, Briët JM, Smit BJ, Tamminga P, van Baar A, Dekker FW, Vulsma T. Effects of thyroxine supplementation on neurologic development in infants born at less than 30 weeks' gestation. *N Engl J Med.* 1997 Jan 2;336(1):21-6.
565. Van Wassenaer AG, Kok JH, Briët JM, van Baar AL, de Vijlder JJ. Thyroid function in preterm newborns; is T4 treatment required in infants < 27 weeks' gestational age? *Exp Clin Endocrinol Diabetes.* 1997;105 Suppl 4:12-8.
566. Chowdhry P, Scanlon JW, Auerbach R, Abbassi V. Results of double-blind study of thyroid replacement in very low-birth-weight premature infants with hypothyroxinemia. *Pediatrics.* 1984 Mar;73(3):301-5

Pre-term infants: Triiodothyronine or thyroxine treatment

567. La Gamma EF, van Wassenaer AG, Ares S, Golombek SG, Kok JH, Quero J, Hong T, Rahbar MH, de Escobar GM, Fisher DA, Paneth N. Phase 1 trial of 4 thyroid hormone regimens for transient hypothyroxinemia in neonates of <28 weeks' gestation. *Pediatrics.* 2009 Aug;124(2):e258-68.
568. Valerio PG, van Wassenaer AG, de Vijlder JJ, Kok JH. A randomized, masked study of triiodothyronine plus thyroxine administration in preterm infants less than 28 weeks of gestational age: hormonal and clinical effects. *Pediatr Res.* 2004 Feb;55(2):248-53.

Children undergoing heart surgery for congenital heart disease

569. arwali EM, Boom CE, Sakidjan I, Santoso A, Fakhri D, Kartini A, Kekalih A, Schwartz SM, Haas NA. Oral triiodothyronine normalizes triiodothyronine levels after surgery for pediatric congenital heart disease*. *Pediatr Crit Care Med.* 2013 Sep;14(7):701-8.
570. Portman MA, Slee A, Olson AK, Cohen G, Karl T, Tong E, Hastings L, Patel H, Reinhartz O, Mott AR, Mainwaring R, Linam J, Danzi S; TRICC Investigators.. Triiodothyronine Supplementation in Infants and Children

REFERENCES preceded by « 2/ »

Undergoing Cardiopulmonary Bypass (TRICC): a multicenter placebo-controlled randomized trial: age analysis. *Circulation*. 2010 Sep 14;122(11 Suppl):S224-33.

571. Mackie AS, Booth KL, Newburger JW, Gauvreau K, Huang SA, Laussen PC, DiNardo JA, del Nido PJ, Mayer JE Jr, Jonas RA, McGrath E, Elder J, Roth SJ. A randomized, double-blind, placebo-controlled pilot trial of triiodothyronine in neonatal heart surgery. *J Thorac Cardiovasc Surg*. 2005 Sep;130(3):810-6.
572. Portman MA, Fearneyhough C, Ning XH, Duncan BW, Rosenthal GL, Lupinetti FM. Triiodothyronine repletion in infants during cardiopulmonary bypass for congenital heart disease. *J Thorac Cardiovasc Surg*. 2000 Sep;120(3):604-8.
573. Mainwaring RD, Capparelli E, Schell K, Acosta M, Nelson JC. Pharmacokinetic evaluation of triiodothyronine supplementation in children after modified Fontan procedure. *Circulation*. 2000 Mar 28;101(12):1423-9

Double-blind, crossover, but not placebo-controlled: Desiccated thyroid extract or T3/T4 associations compared with levothyroxine treatments Double-blind randomized controlled trials with significant superior effects of T4-T3 versus T4 alone

574. Bunevicius R, Kazanavicius G, Zalinkevicius R, Prange AJ Jr. Effects of thyroxine as compared with thyroxine plus triiodothyronine in patients with hypothyroidism. *N Engl J Med*. 1999 Feb 11;340(6):424-9. Institute of Endocrinology, Kaunas Medical University, Lithuania.
575. Hoang TD, Olsen CH, Mai VQ, Clyde PW, Shakir MK. Desiccated thyroid extract compared with levothyroxine in the treatment of hypothyroidism: a randomized, double-blind, crossover study. *J Clin Endocrinol Metab*. 2013 May;98(5):1982-90 (A Patients (n = 70, age 18-65 years) diagnosed with primary hypothyroidism, at the end of the study, 34 patients (48.6%) preferred desiccated thyroid extract (DTE), 13 (18.6%) preferred L-T₄, and 23 (32.9%) had no preference.)

Double-blind randomized controlled study with near significantly superior effects of T4-T3 versus T4 alone

576. Bunevicius R, Jakubonien N, Jurkevicius R, Cernicat J, Lasas L, Prange AJ. Thyroxine vs thyroxine plus triiodothyronine in treatment of hypothyroidism after thyroidectomy for Graves' disease. *Endocrine*. 2002 Jul;18(2):129-33 (no significant differences were found on measures of mood, cognition, or physiologic variables between treatments, but symptoms of hypothyroidism and of hyperthyroidism tended to decrease on a standard symptom scale after combined treatment, mental state tended to improve on some mood scales)

Double-blind randomized controlled trials with no superior significant effects of T4-T3 versus T4 alone, but more patients preferring T4/T3 than T4 alone

577. Appelhof BC, Fliers E, Wekking EM, Schene AH, Huyser J, Tijssen JG, Endert E, van Weert HC, Wiersinga WM. Combined therapy with levothyroxine and liothyronine in two ratios, compared with levothyroxine monotherapy in primary hypothyroidism: a double-blind, randomized, controlled clinical trial. *J Clin Endocrinol Metab*. 2005 May;90(5):2666-74. (141 patients (18-70 yr old) with primary autoimmune hypothyroidism: 52.2% and 41.3% patients preferred the T3-T4 combinations (in T4:T3 ratios of 5:1 and 10:1 respectively) compared to 29.2% for T4 alone treatment)
578. Saravanan P, Simmons DJ, Greenwood R, Peters TJ, Dayan CM. Partial substitution of thyroxine (T4) with triiodothyronine in patients on T4 replacement therapy: results of a large community-based randomized controlled trial. *J Clin Endocrinol Metab*. 2005 Feb;90(2):805-12. University of Bristol, Whitson Street, Bristol BS1 3NY, UK. (697 hypothyroid patients, a subgroup of patients showing transient improvement after partial substitution with T(3))

Non-randomized controlled trials with no superior significant effects of T4-T3 versus T4 alone, but more patients preferring T4/T3 than T4 alone

579. Escobar-Morreale HF, Botella-Carretero JI, Gomez-Bueno M, Galan JM, Barrios V, Sancho J. Thyroid hormone replacement therapy in primary hypothyroidism: a randomized trial comparing L-thyroxine plus liothyronine with L-thyroxine alone. *Ann Intern Med*. 2005 Mar 15;142(6):412-24. (28 women with overt primary hypothyroidism (18/26 patients preferred the T3-T4 combinations, 2/26 the T4 alone treatment; open trial)

Double-blind randomized controlled trial with no superior significant effects of T4-T3 versus T4 alone, but patients with T3-T4 kept a higher TSH (indicative of a too low dose)

580. Walsh JP, Shiels L, Lim EM, Bhagat CI, Ward LC, Stuckey BG, Dhaliwal SS, Chew GT, Bhagat MC, Cussons AJ. Combined thyroxine/liothyronine treatment does not improve well-being, quality of life, or cognitive function compared to thyroxine alone: a randomized controlled trial in patients with primary hypothyroidism. *J Clin Endocrinol Metab*. 2003 Oct;88(10):4543-50.

Double-blind randomized controlled trial with globally no superior significant effects of T4-T3 versus T4 alone, except on one parameter where the patients on T4-T3 combinations did better:

REFERENCES preceded by « 2/ »

581. Clyde PW, Harari AE, Getka EJ, Shakir KM. Combined levothyroxine plus liothyronine compared with levothyroxine alone in primary hypothyroidism: a randomized controlled trial. *JAMA*. 2003 Dec 10;290(22):2952-8. (the 1/13 remaining test (Grooved Peg Board) showed better performance in the control group.

Double-blind randomized controlled trials with no superior effects of T4-T3 versus T4 alone

582. Siegmund W, Spieker K, Weike AI, Giessmann T, Modess C, Dabers T, Kirsch G, Sanger E, Engel G, Hamm AO, Nauck M, Meng W. Replacement therapy with levothyroxine plus triiodothyronine (bioavailable molar ratio 14 : 1) is not superior to thyroxine alone to improve well-being and cognitive performance in hypothyroidism. *Clin Endocrinol (Oxf)*. 2004 Jun;60(6):750-7.
583. Sawka AM, Gerstein HC, Marriott MJ, MacQueen GM, Joffe RT. Does a combination regimen of thyroxine (T4) and 3,5,3'-triiodothyronine improve depressive symptoms better than T4 alone in patients with hypothyroidism? Results of a double-blind, randomized, controlled trial. *J Clin Endocrinol Metab*. 2003 Oct;88(10):4551-5.
584. Rodriguez T, Lavis VR, Meininger JC, Kapadia AS, Stafford LF. Substitution of liothyronine at a 1:5 ratio for a portion of levothyroxine: effect on fatigue, symptoms of depression, and working memory versus treatment with levothyroxine alone. *Endocr Pract*. 2005 Jul-Aug;11(4):223-33.

Aldosterone: 13 placebo-controlled trials – all in adults

Healthy men: IV aldosterone produces acute cardiovascular (sympathetic) effects (first 45 min after injection) and delayed (5 ½ - 6 ½ h after) increased vagal tone (parasympathetic predominance)

585. Schmidt BM1, Montealegre A, Janson CP, Martin N, Stein-Kemmesies C, Scherhag A, Feuring M, Christ M, Wehling M. Short term cardiovascular effects of aldosterone in healthy male volunteers. *J Clin Endocrinol Metab*. 1999 Oct;84(10):3528-33.

Healthy men: Aldosterone at 100 µg, tending to increase cardiac vagal activity and enhances the heart rate (tachycardia) response to diastolic blood pressure-reducing nitroprusside

586. Heindl S, Holzschneider J, Hinz A, Sayk F, Fehm HL, Dodt C. Acute effects of aldosterone on the autonomic nervous system and the baroreflex function in healthy humans. *J Neuroendocrinol*. 2006 Feb;18(2):115-21.

Healthy men: Aldosterone at 3 µg /min. rapidly impairs the baroreflex response,

587. Schmidt BM, Horisberger K, Feuring M, Schultz A, Wehling M. Aldosterone blunts human baroreflex sensitivity by a nongenomic mechanism. *Exp Clin Endocrinol Diabetes*. 2005 May;113(5):252-6. (tachycardic response to arterial baroreceptor deactivation was more pronounced in the aldosterone experiments

Healthy men: Aldosterone (+7.6%) increases blood flow by increasing NO release and at the vascular smooth muscle cells by promoting vasoconstriction of forearm arteries

588. Romagni P, Rossi F, Guerrini L, Quirini C, Santiemma V. Aldosterone induces contraction of the resistance arteries in man. *Atherosclerosis*. 2003 Feb;166(2):345-9.
589. Schmidt BM, Oehmer S, Delles C, Bratke R, Schneider MP, Klingbeil A, Fleischmann EH, Schmieder RE. Rapid nongenomic effects of aldosterone on human forearm vasculature. *Hypertension*. 2003 Aug;42(2):156-60.

Healthy men: IV aldosterone rapidly attenuated endothelium-dependent vasodilatation to acetylcholine (-28% less vasodilatation)

Healthy men: Aldosterone increases phosphocreatine recovery in muscles to significantly higher levels immediately after isometric contraction within 8 min of aldosterone administration

590. Zange J, Müller K, Gerzer R, Sippel K, Wehling M. Nongenomic effects of aldosterone on phosphocreatine levels in human calf muscle during recovery from exercise. *J Clin Endocrinol Metab*. 1996 Dec;81(12):4296-300.
591. Christ M1, Zange J, Janson CP, Müller K, Kuklinski P, Schmidt BM, Tillmann HC, Gerzer R, Wehling M. Hypoxia modulates rapid effects of aldosterone on oxidative metabolism in human calf muscle. *J Endocrinol Invest*. 2001 Sep;24(8):587-97.

Healthy men: IV aldosterone at 500 µg (pharmacological dose) slightly reduces glomerular filtration rate and with inhibition of nitric oxide synthase reduces renal blood flow, triggering a mechanism for increases in blood pressure

592. Schmidt BM, Sammer U, Fleischmann I, Schlaich M, Delles C, Schmieder RE. Rapid nongenomic effects of aldosterone on the renal vasculature in humans. *Hypertension*. 2006 Apr;47(4):650-5.

Healthy men: Aldosterone reduces the excretion of sodium and chloride and increases excretion of potassium and (net) acid in the urine

REFERENCES preceded by « 2/ »

593. Lemann J Jr, Piering WF, Lennon EJ. Studies of the acute effects of aldosterone and cortisol on the interrelationship between renal sodium, calcium and magnesium excretion in normal man. *Nephron*. 1970;7(2):117-30.

Healthy men: no obvious effect on sleep of aldosterone

594. Born J, Zwick A, Roth G, Fehm-Wolfsdorf G, Fehm HL. Differential effects of hydrocortisone, flucortolone, and aldosterone on nocturnal sleep in humans. *Acta Endocrinol (Copenh)*. 1987 Sep;116(1):129-37.

Patients with disease

Orthostatic hypotension: Aldosterone reduces orthostatism

595. Ditzel J, Hansen PH, Kemp E, Lindbjerg IF. Effect of aldosterone on orthostatic circulatory failure. *Acta Med Scand*. 1964 Jun;175:673-80.

Suspected coronary heart disease: IV aldosterone at supraphysiological dose (1 mg) increases systemic vascular resistance, cardiac output, and cardiac index within 3 minutes, effect disappeared within 10 min.

596. Wehling M1, Spes CH, Win N, Janson CP, Schmidt BM, Theisen K, Christ M. Rapid cardiovascular action of aldosterone in man. *J Clin Endocrinol Metab*. 1998 Oct;83(10):3517-22.

Supraventricular arrhythmias: IV aldosterone increases monophasic action potential duration within minutes in patients

597. Tillmann HC1, Schumacher B, Yasenyev O, Junker M, Christ M, Feuring M, Wehling M. Acute effects of aldosterone on intracardiac monophasic action potentials. *Int J Cardiol*. 2002 Jul;84(1):33-9

Fludrocortisone treatment: 19 placebo-controlled studies – 17 in adults

Healthy adults

Young healthy women: Fludrocortisone treatment produces significant suppression of CRH secretion, trend to significant reduction of secretion of ACTH and cortisol secretion from dose 75 µg/day on

598. Karamouzis I, Berardelli R, Marinazzo E, D'Angelo V, Zinnà D, Minetto MA, Zichi C, Fussotto B, Giordano R, Ghigo E, Arvat E. The acute effect of fludrocortisone on basal and hCRH-stimulated hypothalamic-pituitary-adrenal (HPA) axis in humans. *Pituitary*. 2013 Sep;16(3):378-85.

Healthy adults: Fludrocortisone treatment produces significant effects on pituitary- adrenal axias, arterial tone and intestinal sodium excretion

599. Laviolle B, Donal E, Le Maguet P, Lainé F, Bellissant E. Low doses of fludrocortisone and hydrocortisone, alone or in combination, on vascular responsiveness to phenylephrine in healthy volunteers. *Br J Clin Pharmacol*. 2013 Feb;75(2):423-30.

600. Mion D Jr, Rea RF, Anderson EA, Kahn D, Sinkey CA, Mark AL. Effects of fludrocortisone on sympathetic nerve activity in humans. *Hypertension*. 1994 Jan;23(1):123-30.

601. Otte C, Jahn H, Yassouridis A, Arlt J, Stober N, Maass P, Wiedemann K, Kellner M. The mineralocorticoid receptor agonist, fludrocortisone, inhibits pituitary-adrenal activity in humans after pre-treatment with metyrapone. *Life Sci*. 2003 Aug 22;73(14):1835-45.

602. Wenzl HH, Fine KD, Santa Ana CA, Porter JL, Fordtran JS. Effect of fludrocortisone and spironolactone on sodium and potassium losses in secretory diarrhea. *Dig Dis Sci*. 1997 Jan;42(1):119-28.

Aldosterone deficiency: Fludrocortisone produces significantly beneficial effects (reduction of sodium excretion)

603. Laviolle B, Le Maguet P, Verdier MC, Massart C, Donal E, Lainé F, Lavenu A, Pape D, Bellissant E. Biological and hemodynamic effects of low doses of fludrocortisone and hydrocortisone, alone or in combination, in healthy volunteers with hypoadosteronism. *Clin Pharmacol Ther*. 2010 Aug;88(2):183-90.

Orthostatic hypotension: Fludrocortisone significantly reduces orthostatic hypotension in patients

604. Finke J, Sagemüller I. Fludrocortisone in the treatment of orthostatic hypotension: ophthalmodynamography during standing. *Dtsch Med Wochenschr*. 1975 Sep 5;100(36):1790-2.

Vasovagal syncope: Fludrocortisone significantly reduced the likelihood of syncope in patients

605. Sheldon R, Raj SR, Rose MS, Morillo CA, Krahn AD, Medina E, Talajic M, Kus T, Seifer CM, Lelonek M, Klinghenben T, Parkash R, Ritchie D, McRae M; POST 2 Investigators.. Fludrocortisone for the prevention of vasovagal syncope: a randomized, placebo-controlled trial. *J Am Coll Cardiol*. 2016 Jul 5;68(1):1-9.

REFERENCES preceded by « 2/ »

Orthostatic hypotension: Fludrocortisone does not prevent orthostatic hypotension after space flight

606. Shi SJ, South DA, Meck JV. Fludrocortisone does not prevent orthostatic hypotension in astronauts after spaceflight. *Aviat Space Environ Med.* 2004 Mar;75(3):235-9.

Chronic fatigue syndrome: Fludrocortisone associated to hydrocortisone at very low doses does not significantly reduce fatigue

607. Blockmans D, Persoons P, Van Houdenhove B, Lejeune M, Bobbaers H. Combination therapy with hydrocortisone and fludrocortisone does not improve symptoms in chronic fatigue syndrome: a randomized, placebo-controlled, double-blind, crossover study. *Am J Med.* 2003 Jun 15;114(9):736-41.

Chronic fatigue syndrome: Fludrocortisone alone does not significantly improve CFS symptoms

608. Rowe PC, Calkins H, DeBusk K, McKenzie R, Anand R, Sharma G, Cuccherini BA, Soto N, Hohman P, Snader S, Lucas KE, Wolff M, Straus SE. Fludrocortisone acetate to treat neurally mediated hypotension in chronic fatigue syndrome: a randomized controlled trial. *JAMA.* 2001 Jan 3;285(1):52-9.

609. Peterson PK, Pheley A, Schroepfel J, Schenck C, Marshall P, Kind A, Haugland JM, Lambrecht LJ, Swan S, Goldsmith S. A preliminary placebo-controlled crossover trial of fludrocortisone for chronic fatigue syndrome. *Arch Intern Med.* 1998 Apr 27;158(8):908-14.

Borderline personality disorder: Fludrocortisone at supraphysiological doses (400 µg/day) improves memory (cognitive function: verbal, visuospatial and working memory), in healthy subjects only working memory

610. Wingenfeld K, Kuehl LK, Janke K, Hinkelmann K, Eckert FC, Roepke S, Otte C. Effects of mineralocorticoid receptor stimulation via fludrocortisone on memory in women with borderline personality disorder. *Neurobiol Learn Mem.* 2015 Apr;120:94-100.

Borderline personality and major depressive disorders, healthy subjects: No effect of fludrocortisone on autobiographical memory

611. Fleischer J, Wingenfeld K, Kuehl LK, Hinkelmann K, Roepke S, Otte C. Does fludrocortisone influence autobiographical memory retrieval? A study in patients with major depression, patients with borderline personality disorder and healthy controls. *Stress.* 2015;18(6):718-22.

Severe traumatic brain injury: Fludrocortisone associated to hydrocortisone at low doses does not significantly prevent hospital-acquired pneumonia

612. Asehnoune K, Seguin P, Allary J, Feuillet F, Lasocki S, Cook F, Floch H, Chabanne R, Geeraerts T, Roger C, Perrigault PF, Hanouz JL, Lukaszewicz AC, Biais M, Boucheix P, Dahyot-Fizelier C, Capdevila X, Mahe PJ, Le Maguet P, Paugam-Burtz C, Gergaud S, Plaud B, Constantin JM, Malledant Y, Flet L, Sebille V, Roquilly A; Corti-TC Study Group.. Hydrocortisone and fludrocortisone for prevention of hospital-acquired pneumonia in patients with severe traumatic brain injury (Corti-TC): a double-blind, multicentre phase 3, randomised placebo-controlled trial. *Lancet Respir Med.* 2014 Sep;2(9):706-16

Septic shock: Fludrocortisone associated to hydrocortisone at low doses produces beneficial effects, including better renal function

613. Laviolle B, Annane D, Fougereou C, Bellissant E. Gluco- and mineralocorticoid biological effects of a 7-day treatment with low doses of hydrocortisone and fludrocortisone in septic shock. *Intensive Care Med.* 2012 Aug;38(8):1306-14.

Septic shock: Fludrocortisone associated to hydrocortisone at low doses reduces mortality

614. Annane D, Sébille V, Charpentier C, Bollaert PE, François B, Korach JM, Capellier G, Cohen Y, Azoulay E, Troché G, Chaumet-Riffaud P, Bellissant E. Effect of treatment with low doses of hydrocortisone and fludrocortisone on mortality in patients with septic shock. *JAMA.* 2002 Aug 21;288(7):862-71. Erratum in: *JAMA.* 2008 Oct 8;300(14):1652. (-33% lower risk in the corticosteroid group (hazard ratio, 0.67))

Children

Children with syncope or severe presyncope: Fludrocortisone: produces significant beneficial effects to reduce syncopal symptoms; including syncope

615. Salim MA, Di Sessa TG. Effectiveness of fludrocortisone and salt in preventing syncope recurrence in children: a double-blind, placebo-controlled, randomized trial. *J Am Coll Cardiol.* 2005 Feb 15;45(4):484-8.

616. Scott WA, Pongiglione G, Bromberg BI, Schaffer MS, Deal BJ, Fish FA, Dick M. Randomized comparison of atenolol and fludrocortisone acetate in the treatment of pediatric neurally mediated syncope. *Am J Cardiol.* 1995 Aug 15;76(5):400-2

REFERENCES preceded by « 2/ »

Thymosin alpha 1 treatment: 16 human placebo-controlled trials mentioned in Pubmed

Elderly men: the immune stimulation with thymosin-alpha-1 (1 trial, 85 patients)

617. Gravenstein S1, Duthie EH, Miller BA, Roecker E, Drinka P, Prathipati K, Ershler WB. Augmentation of influenza antibody response in elderly men by thymosin alpha one. A double-blind placebo-controlled clinical study. *J Am Geriatr Soc.* 1989 Jan;37(1):1-8.

Sepsis: the improvement with thymosin-alpha-1 and ulinastatin (increased survival, improved immune parameters)(6 trials, 915 patients)

618. Chen H1, He MY, Li YM. Treatment of patients with severe sepsis using ulinastatin and thymosin alpha1: a prospective, randomized, controlled pilot study. *Chin Med J (Engl).* 2009 Apr 20;122(8):883-8.

619. Li Yumin1, Chen Hao, Li Xun, Zhou Wence, He Minyan, Chiriva-Internati M, Wachtel MS, Frezza EE. A new immunomodulatory therapy for severe sepsis: Ulinastatin Plus Thymosin {alpha} 1. *J Intensive Care Med.* 2009 Jan-Feb;24(1):47-53.

620. Zhang Y1, Chen H, Li YM, Zheng SS, Chen YG, Li LJ, Zhou L, Xie HY, Praseedom RK. Thymosin alpha1- and ulinastatin-based immunomodulatory strategy for sepsis arising from intra-abdominal infection due to carbapenem-resistant bacteria. *J Infect Dis.* 2008 Sep 1;198(5):723-30.

(+ 3 other trials mentioned in meta-analysis talks of 6 trials)

621. Han D1, Shang W2, Wang G2, Sun L2, Zhang Y3, Wen H2, Xu L2. Ulinastatin- and thymosin α 1-based immunomodulatory strategy for sepsis: A meta-analysis. *Int Immunopharmacol.* 2015 Dec;29(2):377-82.

622. Chronic obstructive pulmonary disease (acute exacerbation): the improvement with thymosin-alpha-1 (1 trial, 84 patients)

623. Jia Z1, Feng Z, Tian R, Wang Q, Wang L. Thymosin α 1 plus routine treatment inhibit inflammatory reaction and improve the quality of life in AECOPD patients. *Immunopharmacol Immunotoxicol.* 2015;37(4):388-92.

Chronic hepatitis B: the improvement with thymosin-alpha-1 (2 trials,

624. Lim SG1, Wai CT, Lee YM, Dan YY, Sutedja DS, Wee A, Suresh S, Wu YJ, Machin D, Lim CC, Fock KM, Koay E, Bowden S, Locamini S, Ishaque SM. A randomized, placebo-controlled trial of thymosin-alpha1 and lymphoblastoid interferon for HBeAg-positive chronic hepatitis B. *Antivir Ther.* 2006;11(2):245-53.

625. Mutchnick MG1, Lindsay KL, Schiff ER, Cummings GD, Appelman HD, Peleman RR, Silva M, Roach KC, Simmons F, Milstein S, Gordon SC, Ehrinpreis MN. Thymosin alpha1 treatment of chronic hepatitis B: results of a phase III multicentre, randomized, double-blind and placebo-controlled study. *J Viral Hepat.* 1999 Sep;6(5):397-403.

+ 3 other trials mentioned in meta-analysis:

626. Chan HL1, Tang JL, Tam W, Sung JJ. The efficacy of thymosin in the treatment of chronic hepatitis B virus infection: a meta-analysis. *Aliment Pharmacol Ther.* 2001 Dec;15(12):1899-905.

Chronic hepatitis C: the improvement with thymosin-alpha-1 (1 trial, 103 patients)

627. Sherman KE1, Sjogren M, Creager RL, Damiano MA, Freeman S, Lewey S, Davis D, Root S, Weber FL, Ishak KG, Goodman ZD. Combination therapy with thymosin alpha1 and interferon for the treatment of chronic hepatitis C infection: a randomized, placebo-controlled double-blind trial. *Hepatology.* 1998 Apr;27(4):1128-35.

Chronic hepatitis C: no significant improvement with thymosin-alpha-1 (1 trials, 571 patients)

628. Ciancio A1, Andreone P, Kaiser S, Mangia A, Milella M, Solà R, Pol S, Tsianos E, De Rosa A, Camerini R, McBeath R, Rizzetto M. Thymosin alpha-1 with peginterferon alfa-2a/ribavirin for chronic hepatitis C not responsive to IFN/ribavirin: an adjuvant role? *J Viral Hepat.* 2012 Jan;19 Suppl 1:52-9.

629. Andreone P1, Cursaro C, Gramenzi A, Buzzzi A, Covarelli MG, Di Giammarino L, Miniero R, Arienti V, Bernardi M, Gasbarrini G. A double-blind, placebo-controlled, pilot trial of thymosin alpha 1 for the treatment of chronic hepatitis C. *Liver.* 1996 Jun;16(3):207-10.

Cancer (overall) after radiotherapy or chemotherapy (immune depression): trend toward improvement with thymosin-alpha-1 or thymopentin (4 trials, > 100 patients)

630. Chretien PB, Lipson SD, Makuch R, Kenady DE, Cohen MH, Minna JD. Thymosin in cancer patients: in vitro effects and correlations with clinical response to thymosin immunotherapy. *Cancer Treat Rep.* 1978 Nov;62(11):1787-90.

Mentions 3 more placebo-controlled trials in review

REFERENCES preceded by « 2/ »

631. Wolf E1, Milazzo S, Boehm K, Zwahlen M, Homeber M. Thymic peptides for treatment of cancer patients. Cochrane Database Syst Rev. 2011 Feb 16;(2):CD003993.

Cancer (lung) after radiotherapy (immune depression): the improvement with thymosin-alpha-1 (2 trials, 63 patients)

632. Schulof RS, Lloyd MJ, Cleary PA, Palaszynski SR, Mai DA, Cox JW Jr, Alabaster O, Goldstein AL. A randomized trial to evaluate the immunorestorative properties of synthetic thymosin-alpha 1 in patients with lung cancer. J Biol Response Mod. 1985 Apr;4(2):147-58.

633. Schulof RS, Chorba TL, Cleary PA, Palaszynski SR, Alabaster O, Goldstein AL. -cell abnormalities after mediastinal irradiation for lung cancer. The in vitro influence of synthetic thymosin alpha-1. Cancer. 1985 Mar 1;55(5):974-83.