

# Content

A few words of the author	5
Acknowledgments	7
How to read the charts	25
Introduction	27
<b>Chapter 1 - Testosterone: the facts</b>	<b>31</b>
What is testosterone?	33
My own testosterone story	33
Testosterone production	34
Daily testosterone production	34
Pituitary hormones stimulate the production of testosterone	35
Circadian rhythm of testosterone in the serum of young men	35
Aging: Progressive decline in testosterone levels	35
Why do testosterone levels decline in men?	36
<b>Chapter 2 – Testosterone therapy: Its many benefits for men</b>	<b>39</b>
<b>2.1 Testosterone therapy increases the production of most other important hormones</b>	<b>41</b>
<b>2.2 Testosterone therapy makes the mind firm</b>	<b>43</b>
Sharpens thinking and memory	43
Improves creativity	43
Increases mental energy	44
Elevates mood	44
Triggers feelings of love and fatherhood	45
Provides courage	45
Strengthens willpower	46
Makes men ambitious	46
Makes men leaders	46
Makes men protect their territory, family and friends	47
<b>2.3 Testosterone therapy makes men sexier</b>	<b>49</b>
Triggers the desire to seduce	49
Awakens sexual drive	49
Boosts sexual potency	51

<b>2.4 Testosterone therapy makes the male body firm and masculine</b>	53
Increases physical energy	53
Improves sports performance	53
Improves mechanical skills	54
Makes a man's scalp hair solid and voluminous	54
Makes the face masculine and firm	57
Makes the trunk and limbs athletic	57
<b>2.5 Testosterone therapy for healthy aging</b>	59
<b>To prevent and heal psychological disorders</b>	59
Induces calmness, reducing anxiety disorders	59
Brings happiness, reducing depression	61
Enhances memory, protecting against Alzheimer's disease	62
<b>To prevent and heal sexual dysfunction</b>	65
<b>To prevent and heal physical diseases</b>	68
Vascular disease	69
Reduces lipid and homocysteine levels, decreasing dyslipidemia and hyperhomocysteinemia	69
Heals arteries, reducing atherosclerosis and gangrene	70
Reduces blood pressure, moderating arterial hypertension	73
Protects brain arteries, reducing stroke	74
Takes care of leg arteries, reducing intermittent claudication	77
Cardiac disease	78
Makes the body slimmer, stimulating weight loss, reducing obesity	83
Makes patients more sensitive to insulin, attenuating type 2 diabetes	85
Wounds	86
Inflammatory diseases	87
Joint diseases	94
Autoimmune diseases	95
Bone disease, to reverse osteoporosis	96
Intestinal disease, possibly preventing stomach cancer?	97
Prostate disease	98
<b>2.6 Testosterone therapy for longevity</b>	99

<b>Chapter 3 - Testosterone therapy also for women</b>	103
Testosterone therapy toughens women's mind	105
Testosterone therapy is the best enhancer of a woman's libido	105
Testosterone therapy tones a woman's body	105
Testosterone therapy improves women's arteries	106
Testosterone therapy may increase a woman's life expectancy	106
<b>Chapter 4 – Diagnosis of testosterone deficiency</b>	109
<b>4.1 The five pillars confirming testosterone deficiency</b>	111
<b>4.2 Medical history: How long has the patient been testosterone deficient?</b>	112
Physical signs and complaints	112
Testicle lesions or diseases	115
General diseases	116
<b>4.3 Complaints of testosterone deficiency</b>	117
Psychological complaints of testosterone deficiency	118
Physical complaints of testosterone deficiency	119
<b>4.4 Physical signs of testosterone deficiency</b>	121
Testosterone-deficient male bodies	121
Testosterone-deficient genital tissues	122
Testosterone-deficient genitalia and prostate	125
Penis examination	125
Testicle and scrotum examinations	127
Prostate examination	129
<b>4.5 Testosterone laboratory tests</b>	132
<b>4.51 Serum tests</b>	135
<b>4.511 Serum pituitary hormones</b>	136
<b>FSH</b>	136
What is FSH?	136
FSH levels in young men and older men	136
What are adequate, excessive, and deficient levels, and reference range for FSH?	136
Abnormal FSH levels	136
Why low to undetectable FSH levels during testosterone treatment?	138
Treatment of abnormal FSH levels	138

<b>LH</b>	141
LH levels in young men and older man	141
LH slowly increases with aging	141
What are the adequate, excessive, and deficient levels, and reference range for LH?	141
Abnormal LH levels	142
Excessively low LH	142
Low LH during testosterone treatment	142
Treatment of abnormal LH levels	144
<b>Prolactin</b>	146
Elevated prolactin levels	146
Physical signs of prolactin excess	146
What are the adequate, excessive, and deficient levels, and reference range for prolactin?	147
Consequences of prolactin deficiency?	147
Treatment of hyperprolactinemia	148
<b>4.512 Serum sex hormone tests</b>	150
<b>Total testosterone</b>	150
What are the adequate, deficient, and excessive levels and reference range for total testosterone?	150
High SHBG and/or estrogen levels counter the beneficial effects of testosterone	152
Treatment of low testosterone levels	153
<b>Free testosterone</b>	154
Free testosterone, not a sufficiently good test	154
What are the adequate, deficient, and excessive levels and reference range for free testosterone?	154
<b>Bioavailable testosterone</b>	156
What are the adequate, deficient, and excessive levels and reference range for bioavailable testosterone?	156
<b>SHBG</b>	157
SHBG, testosterone-transporting protein	157
High SHBG levels may cause testosterone deficiency in target cells	158
High SHBG levels: real or artefact due to lack of water in blood?	158
Low SHBG levels may cause androgen deficiency in parts of the body that are supplied with blood after other tissues	158
Hormone therapies that decrease or increase SHBG levels	158
What are the adequate, deficient, and excessive levels and reference range for SHBG?	159
Treatment of high SHBG levels (>40 pmol/L)	160
Treatment of low SHBG levels (0-20 nmol/L)	160

<b>Free testosterone or free androgen index</b>	161
Free testosterone index	161
What are the adequate, deficient, and excessive levels and reference range for the free testosterone index?	161
<b>Dihydrotestosterone and androstenediol glucuronide</b>	163
The importance of testing dihydrotestosterone or androstenediol glucuronide	163
Androstenediol glucuronide is a better indicator of androgenicity than dihydrotestosterone	164
High and low androstenediol glucuronide	164
What are adequate, deficient, and excessive levels, and reference range for androstenediol glucuronide?	165
What are adequate, deficient, and excessive levels, and reference range for DHT?	166
Treatment of abnormal androstenediol glucuronide and DHT levels	167
Three situations involving high androstenediol glucuronide (and high DHT) levels	167
<b>Estradiol and estrone</b>	170
The importance of checking estrogen concentrations in men	170
Check estrogen levels as they may increase during testosterone therapy	170
High estrogen levels cause testosterone deficiency	170
Avoid also low estrogen levels as they result in a male estrogen deficiency syndrome	171
What are adequate, excessive, and deficient levels, and reference range for estrogen?	171
Testosterone therapy can increase estrogen levels in men	172
Men whose estrogen levels tend to increase with testosterone therapy	172
Men whose estrogen levels tend to fall with testosterone therapy	173
Adverse consequences of high estrogen levels in men	174
Detecting men who may overproduce estrogens during testosterone therapy	175
Facilitating conditions or factors that increase estradiol levels	176
Treatment of deficient estrogen levels (0-55 pmol/L or 15 pg/mL of estradiol)	176
Choose the right type of specific estrogen-reducing medication	179
Androgen therapy to reduce estrogen levels and increase DHT levels	180
<b>Progesterone</b>	184
Progesterone, a useful test in men with high estradiol and/or androstenediol glucuronide	184
The importance of progesterone for men	184
What are adequate, deficient, and excessive levels, and reference range for progesterone?	185
Treatment of a low progesterone level	186
Treatment of a high progesterone level (> 2 ng/mL)	186

<b>4.513 Serum prostate tests</b>	187
<b>PSA, total and free</b>	187
What is the PSA?	187
Regular PSA measurements	187
PSA measurements: Frequency	187
Progressive increase with age of the PSA	188
Optimal and excessive PSA levels	188
Total PSA measurement in prostate disease	189
Reduce the total PSA	189
Check the free PSA and the ratio of free PSA/total PSA	190
Suppositories of prostate cancer-inhibiting nutrients in case the ratio free PSA/total PSA is below 25 percent	192
<b>Overview of the serum tests</b>	193
<b>4.52 Urine tests</b>	194
Optimal conditions for 24-hour urine collection	194
24-hour urine for follow-up is restricted to transdermal, intramuscular, and implants of testosterone, not sublingual or oral forms	195
<b>Testosterone in 24-hour urine</b>	197
Free testosterone in urine reflects the patient's testosterone production during 24 hours	197
What are the adequate, excessive, deficient, and reference range for urinary testosterone excretion rates?	197
Adjusting the urinary testosterone excretion rates per gram of creatinine removes the differences in body parameters among men	198
<b>Androsterone in 24-hour urine</b>	199
Androsterone in urine reflects the activities of testosterone and dihydrotestosterone	199
What are adequate, excessive, and deficient excretion rates, and reference range for urinary androsterone?	199
Treatment of low urinary androsterone due to signs and symptoms of dihydrotestosterone deficiency (e.g., lack of body hair, erectile dysfunction)	200
Treatment of high urinary androsterone excretion (above the 5 mg/24h)	200
Three situations of high androsterone	201
<b>17-ketosteroids and etiocholanolone in 24-hour urine</b>	202
<b>4.53 Salivary tests</b>	203
<b>Testosterone</b>	203
Salivary testosterone, third-choice test	203
What are adequate, excessive, deficient, and reference range for salivary testosterone excretion rates?	203
Circadian rhythm in salivary testosterone excretion rates	204

<b>4.6 Testosterone laboratory tests: Interpretation</b>	205
<b>Evidence 1: The optimal testosterone level</b>	205
The optimal testosterone level	205
The optimal level is proportionate to the muscle mass	205
The optimal testosterone level corresponds to the highest testosterone level a man had as a young adult	206
<b>Evidence 2: Deficient testosterone levels are levels within the lower two-thirds, below the average, or within the lower third of the reference range of young men</b>	207
In laboratory tests, most testosterone deficiencies are at levels within the reference range	207
The reference ranges for testosterone tests are statistical ranges, not health ranges	207
Higher risks of disease and premature death at testosterone levels within the lower reference range	207
Testosterone levels associated with higher risks of disease reflect testosterone deficiency	208
At which levels of testosterone within the reference range starts testosterone deficiency? It depends on a man's muscle mass	208
Why should men avoid having testosterone levels below the optimal testosterone level?	208
Most men over age 30 are testosterone-deficient	209
Most men over age 30 should be treated with testosterone to remain healthy	209
<b>Evidence 3: Uncorrected high estradiol and SHBG levels cause testosterone deficiency</b>	217
Increases in serum estradiol levels are followed by parallel increases in SHBG levels	219
<b>4.7 Medical imaging tests suggestive of testosterone deficiency</b>	220
<b>Chapter 5 – Testosterone treatment</b>	223
<b>5.1 The 30 precious steps to increase testosterone without testosterone supplementation</b>	225
<b>The seven steps to a better diet</b>	226
Step 1: Consume animal protein-rich foods	226
Step 2: Eat fat-rich animal foods	226
Step 3: Drink water	227
Step 4: Herbal tea rather than coffee	227
Step 5: Fruit and vegetables	228
Step 6: What about sugar?	228
Step 7: Forget about dairy products	228

<b>The ten steps to improve lifestyle and avoid substance abuse</b>	229
Step 8: Be in the light	229
Step 9: Be positive!	229
Step 10: Relax	230
Step 11: Physical activity	230
Step 12: Be stress-free	230
Step 13: A slim body	230
Step 14: Choose your underwear correctly	231
Step 15: Breathe	231
Step 16: No drugs	231
Step 17: Beta blockers, statins – what to do?	231
<b>The four nutritional therapies to help restore testosterone levels and activity</b>	232
Steps 18 and 19: Zinc and vitamin A	232
Step 20: Magnesium	233
Step 21: Vitamin D	233
Step 22: Amino acid supplement	233
<b>The three hormone therapies other than testosterone to help restore testosterone levels and activity</b>	234
Step 23: DHEA	234
Step 24: Thyroid	234
Step 25: Growth hormone	235
<b>The five hormone excesses other than testosterone to avoid</b>	236
Step 26: Avoid excessive estrogen levels	236
Step 27: Avoid overdosing with progesterone therapy	236
Step 28: Avoid thyroid excess	236
Step 29: Avoid melatonin excess	237
Step 30: Avoid any excesses in cortisol or glucocorticoid derivatives	237
<b>5.2 Testosterone treatments</b>	238
<b>Indications for testosterone treatment</b>	238
Permanent testosterone treatment - indicated for	238
Occasional testosterone treatment – occasional increases in dose	238
<b>Contraindications to testosterone treatment</b>	239
Absolute contraindication for testosterone treatment	240
Relative and momentary contraindication for high doses of testosterone	240



<b>5.3 Testosterone medications</b>	241
Choose the right molecule: bioidentical or non-bioidentical	241
Choose the right route of administration for testosterone	242
Bioidentical testosterone	243
Transdermal testosterone creams, gels or patches	243
Can doses of transdermal testosterone transiently change	243
How to apply testosterone creams or gels?	244
Dihydrotestosterone gel	247
Oral capsules of testosterone	247
Sublingual trochees or tablets of testosterone	248
Intranasal testosterone spray	248
Intramuscular testosterone injections	249
Testosterone enanthate or cypionate injections	251
Testosterone undecanoate injections	251
Testosterone implants	252
Anabolic steroids	252
Oral anabolic steroids	252
Intramuscular anabolic steroid injections	253
Overview of the different routes of testosterone administration	254
Overview of oral, sublingual, and transdermal testosterone preparations	255
Overview of intramuscular and pellet testosterone preparations	256
<b>5.4 Starting testosterone treatment</b>	257
<b>Use physiological doses</b>	257
<b>Starting testosterone therapy</b>	257
Start at low doses for sensitive and frail men	257
Start at the right dose in most men	258
How to find the right dose of testosterone	258
Mild testosterone deficiencies	260
Treatment for mild testosterone deficiencies	261
Moderate testosterone deficiencies	262
Treatment for moderate testosterone deficiencies	263
Medium testosterone deficiencies	264
Treatment for medium testosterone deficiencies	265
Important testosterone deficiencies	267
Treatment for important testosterone deficiencies	268
Severe testosterone deficiencies	270
Treatment for severe testosterone deficiencies	271
Near-total testosterone deficiencies	273
Treatment for near-total testosterone deficiencies:	274
Start at high doses in emergency	276
Overview	276
<b>Slow progress with testosterone therapy</b>	277

<b>Chapter 6 – Follow-up of testosterone therapy</b>	279
<b>6.1 Check whether the testosterone dose is adequate</b>	281
<b>6.2 Underdosed testosterone treatment: How to detect a too low dose of testosterone</b>	283
Estimate the degree of remaining testosterone deficiency	285
Increasing a too low dose of testosterone	287
Persistent muscle loss or underdevelopment may be due to or aggravated by other hormone deficiencies	288
Recognize how long it has been since the signs and symptoms of testosterone deficiency first appeared	290
<b>6.3 Overdosed testosterone treatment: Detecting an excessive testosterone dose</b>	292
Testosterone overdose signs are usually the opposite of testosterone deficiency signs	292
Estimate the degree of remaining testosterone excess	294
Distinguish between early and late signs of testosterone excess	294
Severe long-term testosterone excess can create a permanent need for more testosterone	295
Testosterone overdoses in laboratory tests without any complaints and signs of testosterone excess	297
Stopping testosterone treatment or not before reducing the dose	299
<b>6.4 Reducing the dose of testosterone</b>	300
Muscles remain overdeveloped despite dose reductions	301
How long does it take for excess signs to disappear?	303
<b>6.5 Adjust the testosterone dose to changing conditions</b>	304
Adjust the dose of testosterone to changes in diet, lifestyle, intestinal health, or other hormone levels	304
Adjust the route of administration of testosterone to avoid aggravation of testosterone deficiency, or treat wounds and diseases	306
<b>6.6 Ensure the safety of testosterone therapy</b>	307
How to make testosterone treatment safe and avoid problems: Seven recommendations to increase the safety of testosterone therapy	307

<b>Chapter 7 – Solve follow-up problems during testosterone therapy</b>	309
<b>7.1 Quick side effects of testosterone therapy</b>	312
Oily skin and acne	313
Reddish face	314
Excessively aggressive, impatient, authoritarian attitudes	315
Excessive libido and erections	316
Edema in feet	317
Insufficient improvement (insufficient disappearance of testosterone deficiency signs and symptoms)	318
<b>7.2 Moderately slow side effects of testosterone therapy</b>	319
Painful and swollen breasts	319
Overdeveloped muscles	320
<b>7.3 Slow side effects of testosterone therapy</b>	321
Male pattern baldness	321
Excessive body hair (hirsutism)	329
Testicle and prostate disorders due to high estrogen levels	330
Smaller testicles (testicular shrinkage)	330
Infertility	331
Benign prostate hypertrophy	331
<b>Chapter 8 – Middle-aged and older men’s genital diseases: How to treat with testosterone and other therapies</b>	333
<b>8.1 How to reduce enlarged breasts in men</b>	335
<b>8.2 How to treat erectile dysfunction</b>	337
<b>8.3 How to treat Peyronie’s disease</b>	344
<b>8.4 How to reduce benign prostate hypertrophy</b>	346
<b>8.5 How to screen for prostate cancer</b>	349
<b>8.6 How to prevent prostate cancer</b>	352
<b>8.7 How to treat prostate cancer patients with testosterone</b>	354
<b>Chapter 9 – Tips and opinions from experienced doctors</b>	361
<b>Start supervised prevention with testosterone treatment early</b> (Dr. Rueff)	363
<b>No old-age limit for testosterone treatment</b> (Dr. Naett)	363
<b>Find the testosterone treatment that is best adapted to your patient</b> (Dr. Gerin)	364
<b>Adverse consequences of anabolic steroid overuse</b> (Dr. Poutet)	365
<b>Testosterone deficiency can lead to metabolic syndrome</b> (Dr. Douwes)	366
<b>To support testosterone, men should additionally take other key hormone and nutritional therapies and avoid chemicals</b> (Dr. Hotze)	366

<b>Chapter 10 – Questionnaires to test yourself for testosterone</b>	369
<b>Questionnaires to test for testosterone adequacy</b>	371
Check masculine and athletic features	371
Check complaints	372
Score evaluation for testosterone adequacy	374
<b>Questionnaires to test for testosterone excess</b>	375
Check complaints	375
Follow-up of testosterone treatment	375
Score evaluation for testosterone excess	376
Detect the physical signs of testosterone deficiency	377
Score evaluation for testosterone adequacy by physical examination	379
<b>Chapter 11 – Testosterone treatment in men explanation</b>	381
Correct administration of testosterone	383
Control whether the testosterone dose is correct	385
<b>Chapter 12 – Follow-up questionnaire for the patient</b>	387
<b>Chapter 13 – Frequently asked questions on testosterone therapy</b>	391
<b>Frequency of testosterone therapy</b>	393
Why do men rarely treat themselves with testosterone? Why are most physicians not treating testosterone deficiency in their male patients?	393
<b>Alternatives to testosterone treatment</b>	394
Can DHEA treatment replace testosterone?	394
Androgenic anabolic steroids: is there a place for them?	394
<b>Associating testosterone with other treatments</b>	396
Can testosterone therapy be associated with Viagra, Cialis, Levitra and other phosphodiesterase-5 inhibitors to treat impotence?	396
Can testosterone therapy be associated with finasteride and other 5-alpha-reductase inhibitors to reduce male pattern baldness?	396
Can the finasteride syndrome and the accompanying erectile dysfunction, anxiety and inflammation be prevented and treated by taking finasteride and other 5-alpha reductase inhibitors together with testosterone?	396
<b>Doses of testosterone treatment</b>	397
Can testosterone therapy cause irreversibly oversized muscles?	397
Is testosterone therapy (to correct testosterone deficiency) a form of doping?	398

<b>Duration of testosterone treatment</b>	399
Does a patient need to take testosterone therapy lifelong?	399
<b>Suspected adverse effects of testosterone therapy</b>	400
Is testosterone safe for the heart?	400
Can testosterone therapy in some cases irreversibly reduce rather than improve erectile function?	401
Can testosterone therapy make the testicles smaller?	401
Can testosterone therapy reduce fertility?	402
Is testosterone therapy safe for the prostate?	403
Is testosterone therapy safe for men with prostate cancer?	403
Can testosterone therapy reduce the patient's own (endogenous) testosterone production by the testicles?	404
<b>Conclusion</b>	407
<b>References</b>	409
Testosterone, it's many benefits for men	414
Deficient testosterone levels are levels within the lower two-thirds, below the average, or within the lower third of the reference range of young men	491
Placebo-controlled studies with testosterone	524
Adverse effects of estrogens	559
Male pattern hair loss	548
Benign prostate hypertrophy	559
Prevention of prostate cancer	565
Prostate cancer	571
<b>Biography</b>	621
<b>Further reading</b>	629
<b>To go further</b>	633
<b>Index</b>	638