Male Hypogonadism/Low Testosterone in Men – Patient Screening and Monitoring Guidelines

PCCA Document #97028

Hypogonadism in men is primarily a state involving lower than expected levels of testosterone, and it can occur in men at various stages of life. In many men, it correlates with aging, but low testosterone can also occur in younger men. While there is no officially recognized diagnosis, there are laboratory values and specific symptoms that are clearly identified with low testosterone. Once treatment has begun, patient monitoring is very important, and there are definite markers that should be followed.

SCREENING

There are **two major elements** to consider in determining whether or not a patient should be treated for low testosterone – **laboratory values**, primarily testosterone, and the **presence of symptoms** that may correlate with the laboratory values. Both of these elements are vital in proper patient care.

1. **Key Laboratory Test:**
   Total testosterone, free testosterone, estradiol. LH (Leutenizing Hormone) is very important in determining whether or not patient has primary (hypergonadotrophic) or secondary (hypogonadophic) hypogonadism. Other hormone lab values that can be useful are DHEA, SHBG (sex hormone-binding globulin), DHT (dihydrotestosterone), estrone and prolactin. In addition, PSA, Hemaglobin and Hematocrit should be measured before beginning testosterone therapy. *Due to diurnal variation of testosterone and other hormone production, morning testing is preferred. See Laboratory Value chart below.

Testosterone Serum Levels:

Lab Value	Units	Alt. Units	Comments
Total Testosterone	300-1000 ng/dL	0.4-41.6 nmol/L	Optimal Range: 600-750 ng/dL
Free Testosterone	47-244 pg/mL	190-660 pmol/L	Also expressed as a percent: 1.5-3.2% of total testosterone
Bioavailable Testosterone	130.5-681.7 ng/dL	3-12 nmol/L	Also expressed as 84-402 ng/dL
Note: pg/mL = ng/L	Thus, pg/mL = ng/dL x 10		Example: 47-244 pg/mL = 4.7-24.4 ng/dL

Testosterone and Estrogen Saliva Levels:

Lab Value	Units	Alt. Units	Comments
Free Testosterone	40-200 pg/mL		With topical use, range is likely higher (500-2500 pg/mL)
Estradiol	0.76-2.18 pg/mL	2.8-8.0 pmol/L	Optimal Range: 0.76-1.63 pg/mL, 2.8-6.0 pmol/L

Estradiol (E2) and Estrone Serum Levels:

Lab Value	Units	Alt. Units	Comments
Estradiol	0-50 pg/mL	0-5 ng/dL	Optimal Range: 20-30 pg/mL (2-3 ng/mL)
Estrone	<65 pg/mL		Range: 10-65 pg/mL

Other Important Values:

Lab Value	Units	Alt. Units	Comments
SBHG	13-71 nmol/L	0.5-1.5 mcg/dL	Mean is 0.9 mcg/dL
DHEA	2-9 ng/dL	7-31 nmol/L	Older men are usually deficient.
DHEA(S)	500-2500 mcg/dL	1.3-6.8 µ/mol/L	
DHT	20-50 ng/dL		
Prolactin	7-18 ng/mL		
LH	1.3-13 IU/L		
FSH	0.9-15 IU/L		
Zinc	75-291 mcg/dL		
PSA	<4 ng/mL		
Hct	<52 SI Units		
Progesterone	<1.0 ng/mL	<3.18 nmol/L	

2. Key patient History and Physical:

A questionnaire such as PCCA document # 94123, Male Screening Form, or the ADAM questionnaire is very helpful in gathering information relative to symptoms of low testosterone. See Symptoms chart below.

3. Key Symptoms:

Decrease in sex drive. Difficulty in establishing or maintaining erections. Decrease in spontaneous early morning erections. Other symptoms include feeling tired more easily, feeling tired more than usual, feeling more irritable and/or depressed than in past. Other symptoms that can be related to low testosterone in men include these: decrease in muscle mass, increase in waist size, loss of muscle strength, loss of height. (Others as listed on screening form.)

Symptoms:

Specific Symptoms	Less Specific Symptoms
Difficulty establishing and/or maintain full erections	Increased fatigue/more tired than usual
Reduced sex drive/spontaneous early morning erections	Less enjoyment in personal interests/hobbies
Height loss/Increased joint and/or muscle pains	Decreased mental sharpness/poor concentration
Loss of axillary/pubic hair, reduced need to shave	Changes in usual sleep pattern
Small (<5ml) or shrinking testes	Decreased muscle mass/muscle strength
Infertility/low to zero sperm count	Increased body fat/waist size
Breast discomfort/gynecomastia	Diminished physical or work performance
Hot flushes, sweats	Mild anemia

MONITORING

We will monitor patient both by re-checking laboratory values and assessing patient symptoms.

Relative to testosterone levels, our goal should be to increase testosterone to mid-to-upper levels of the ranges. For most men, there is no increased benefit by raising testosterone above the upper limit. Very importantly, hemoglobin and hematocrit should be monitored; high hematocrit levels, often correlating with high testosterone levels, can pose a patient threat. In some men, an increase in testosterone may raise estradiol to high out-of-range numbers, and it should also be monitored. In addition, PSA should be monitored, as the known presence of prostate cancer is a contraindication to testosterone use, and PSA is one of the markers for prostate cancer. A cautious approach to testing would be to test at one month, three months, six months and one year, in the first year of therapy. Beyond the first year, monitoring levels at six month intervals would be prudent; many patients are managed well after the first year on an annual testing basis.

Physical findings after testosterone therapy has begun may include testicular atrophy, a shrinking of the size of the testes. A decrease in sperm production is also common in testosterone supplementation. Therefore, in men who wish to maintain their fertility and testicular size, options to boost testosterone production (such as HCG and/or clomiphene – information included in PCCA document #94122), rather than supplementation itself, should be considered.

Monitoring:

Monitoring Parameters	Comments
Symptoms, AEs	3 to 6 months after initiation, yearly thereafter, consider formulation-specific AEs.
Testosterone level	3 to 6 months after initiation or dose adjustment, Yearly thereafter. Consider formulation-specific timing.
Bone mineral density	Lumbar spine and/or femoral neck 1 to 2 years after initiation in men with osteoporosis or low trauma fractures.
PSA age >40 years with baseline PSA >0.6	Digital rectal exam prior to initiation PSA 3 to 6 months after initiation. Per prostate cancer screening guidelines thereafter.
Urologic consultation	PSA increase of >1.4 ng/mL in a 12-month period; Increases >0.4ng/mL/year with 6 month level as reference, given >2 years of levels
Hematocrit	3 to 6 months after initiation, Yearly thereafter. Hold therapy if >54% and assess for hypoxia and sleep apnea. Resume therapy if returns to WNL.