PERFORMANCE ENHANCING DRUGS (PEDs): THEY WORK
ANABOLIC STEROIDS ABUSE (ASA)

Expanding definition: any exogenous substance used to better perform athletically
GnRH

FSH

-LH

Testosterone

DHT

Estradiol

Inhibin B, Follistatin

Leydig cell

Frequency

Amplitude

Continuous tonic inhibition of peripheral steroids

GCs

Opioid

Regulation

FSH - LH

Aromatase CYP19

5-alpha-reductase

DHT

Leydig cell

Sertoli cell

Inhibin B, Follistatin

Activin

Testosterone

GnRH

(+)

(-)

(-)

(-)

(+)

(+)

(-)

(-)
Effectiveness of AAS and side effects depend on metabolism and tissue specificity and activity

Modification in the structure = androgenic v anabolic activity
Multiple PED are used together: end-organ action of androgens is enhanced by HGH and local recruitment of co-activators and co-repressors.
Patient experience

Story written by one of my patient’s

Risk factors to initiate anabolic steroids abuse

• Teenagers
• Skinny/tall – peer pressure: culturally driven
• Delayed puberty
• Gym culture; pack motivation
• History of bulling
• Physical and sexual abuse at home
• Lack of social support
Start at Age 17

- 1 cc of Deca Durabolin + 2 tabs of 25 mg Dianabol
- 2 cc of testosterone cypionate every week
- HGH

Age 20

- Sustanon 2 cc a week (500 mg)
  + androl daily (100 mg)
- Testosterone cypionate (3 cc/week)
  + Equipose (2 cc/week)
  + Anadrol
  + Dianabols
  + Cialis
Age 21: 9 cc of injectable anabolic steroids a week

- 3cc (750mgs)/wk; Testosterone Cypionate
- 1cc (100mg)/eod; Testosterone Propionate
- Insulin (short acting)- 4 iu/day  Mon-Fri
- Creatine. Celltech 70mgs of Dextrose per serving
- Protein 50g/day
- Adderall to keep me focused in college as my grades seemed to decline a b
- Cialis/OTC male enhancements
- 2 tabs (100mgs)/day; Anadrol
- 2cc (500mgs)/wk; Deca Durabolin

Side effects patient’s perspective

- Bloating, water gain
- Acne
- Depression
- Erectile dysfunction
- Escalating drug number and quantity use: cost
- Agression and mood swings
- Azoospermia
- Jail and legal consequences
**Dianabol (Meth-androstenolone) oral**

- Developed in 1956s by Ciba
- FDA approved use in past: osteoporosis; now off USA market
- Dominant anabolic and less androgenic properties: muscle mass gains
- Aromatase: highly potent methestradiol
  - Gynecomastia
  - HTN
  - Fluid retention
- Used in combination stacks
- Suppression of HDL and increase in LDL
- Hepatotoxic
- Dose used: 15-25 mg per day (BID/TID)
- Start of the cycle for 8-12 weeks
- Cost: 1000 tabs of 5 mg = $100

**Deca Durabolin (Nandrolone Decanoate)**

- Developed by Organon in 1962
- Anabolic, active compound: nandrolone
- Use: off-season mass gains
- Peak 1-2 days, lasts 2 weeks, injections
- Estrogenization: weak, DHT weak, progesterone: high
- Increases IGF-1 synthesis, collagen, and bone mineralization
- Acne, HDL/LDL ratio, hair loss: mild to moderate
- Dose: recovery and repair: 100-200 mg every 2-4 weeks
- Anabolic effects: 100-400 mg every week x 12 weeks
- FDA: not available in USA, available and legal in most countries
- 10 ml of 100 mg/ml: $45
Sustanon 250 (IM) Omnadren

- Developed by Organon to even peaks of IM testosterone
  - 30mg/ml Testosterone Propionate
  - 60mg/ml Testosterone Phenylpropionate
  - 60mg/ml Testosterone Isocaproate
  - 100mg/ml Testosterone Decanoate
- Classic testosterone profile
- Conversion to E2 and DHT high
- Anabolic and androgenic activities similar
- British formulary approved
- Not available on USA market

Tren (Trenbolone acetate) IM

- Highly androgenic steroid for vet use to achieve lean muscle mass
- 500 anabolic and 500 androgenic
- Low E2 conversion
- FDA approved for vet use only, widely available outside of USA
**Winstrol (stanozolol)**

- DHT derived
- 300 anabolic 30 androgenic
- Low E2
- Lowers SHBG - increases free steroids
- Can be both injected and taken orally

**Anadrol (Oxymetholone) 50mg tabs**

- FDA approved for aplastic anemia 1-5 mg/kg for 3-6 months
- DHT like structure with lack of aromatization
- Highly androgenic
- 17-alpha-alkylated: high risk of liver toxicity
- Used for 4-6 weeks because of liver toxicity, HTN, and high level of increase in HCT
- Peliosis hepatis and liver cancer has been reported
**Boldenone Undecylenate (Equipose) IM**

- Developed by Ciba for humans in 1950 and then adopted by Squibb in 1970 for vet use
- FDA approved for animal use only
- Modified testosterone with reduced E2 conversion
- Widely available in underground market
- Similar side effects as testosterone IM
- No progestin effect

**Anavar (oxandrolone) 5 mg tabs**

- Modified DHT oral developed by Searle in 1964
- FDA approved in USA at 1 – 20 mg
- Anabolic 300 and androgenic 20
- Used at 20-60 mg for 2-4 weeks
Methyl-1-Testosterone (Methyldihydroboldenone) (over the counter supplement)

- Effective dose 20-40 mg/day oral
- DHT derived
- No E2 conversation
- 400 anabolic v 20 androgenic activity
- HDL and LDL and liver toxicity
- Used predominantly to bulk mass without gynecomastia

Beginners/intermediate cycle

<table>
<thead>
<tr>
<th>Week</th>
<th>Sustanon</th>
<th>Deca Durabolin</th>
<th>Dianabol</th>
<th>Ostarine MK-2866</th>
<th>Aromasin</th>
<th>N2Guard</th>
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<tr>
<td>7</td>
<td>500mgs/ew</td>
<td>600mgs/ew</td>
<td>--OFF--</td>
<td>25mgs/ed</td>
<td>25mgs/ed</td>
<td>7caps/ed</td>
</tr>
<tr>
<td>8</td>
<td>500mgs/ew</td>
<td>600mgs/ew</td>
<td>--OFF--</td>
<td>25mgs/ed</td>
<td>25mgs/ed</td>
<td>7caps/ed</td>
</tr>
</tbody>
</table>
Classification of PEDs

• Lean mass and muscle growth - drive or amplify the growth of muscle and lean body mass, improve recovery:
  – Anabolic androgenic steroids (AAS), xenoandrogens, hCG, beta-2 agonists, selective estradiol receptor modulators (SERMs), aromatase inhibitors (AI), ?selective androgen receptor modulators (SARMs): Acetamidoxolutamide
  – human growth hormone, as well as some of their precursors, and IGF-1

• Stimulants - stimulate the body and mind – aggression, focus, energy
  – caffeine, amphetamine, methamphetamine

• Painkillers mask athletes’ pain

• Sedatives, beta-blockers improve steady hands and accurate aim, to overcome excessive nervousness or discomfort
  – diazepam, propranolol, clonazepam

• Diuretics expel water from athletes’ bodies

• Blood boosters increase the oxygen-carrying capacity
  – EPO

• Masking drugs are used to prevent the detection of other classes of drugs

Most of AAS used as PED are not legal in USA – clinical trials and publications - limited
Prevalence and timing of use

- Self reported internet based questionnaires – selection bias - over reported
- Structured interviewed of adolescent, student health, and general practice – concern about privacy and penalization – underreported
- WADA/USADA data – only applies to athletes within regulated events – not all sports follow same rules – every event top three finishers are always tested and then randomly selected athletes – anybody can be tested outside of event
- Sampling of urine of large populations - obtained for other reasons – detection specificity – standards needed to detect new compounds

- **Estimated prevalence in USA**
  - < 16 years – 6%
  - < 20 years – 25%
  - Median: 22-24 years of age
  - Population prevalence – 1 % - androgenic anabolic steroids (AAS)
  - 1,000,000 – 3,000,000 men either used or are currently using AAS

At risk populations

- Athletes – professional, semi-professional, amateurs
- Younger age and aging men
- Social isolation and social pressure
- Poor socioeconomic status and high economic status
- Incarceration
- Military, police forces – pressure to perform at certain level = age older
- Body image disorder
- Depression
- Poor coping mechanisms
- High risk health behaviors – multi-drug dependence: opioids, illicit drugs, alcohol
- Antisocial and violent behavior, ? Rage
- Suicidality
Identify the reason for ASA

**STOP**=**REPLACE**
**MOTIVATION** – WANT TO QUIT: WHY?
UNDERSTAND PATIENT GOAL

**AWARENESS OF CONSEQUENCES**
TREAT AS ANY OTHER DEPENDENCY
PREVENT = ETOH WITHDRAWAL

Side effects – tissue and organ specific

**Testosterone**
- **Cardiovascular And Metabolic Role**
  - Increased fat free body mass
  - May decrease risks of cardiovascular events
- **Brain**
- **Memory**
- **Spatial recognition**
- **Libido**
- **Mood**
- **Sexual self awareness**

**Male**
- **Bone and Strength**
- **Osteopenia and osteoporosis**
- **Closure of epiphyses**
- **Fertility**
- **Stimulates Spermatogenesis**
- **Sustains accessory glands**
- **Main source of estradiol**
- **Genitalia**
  - Growth of penis
  - Tertiary sexual characteristics
  - Growth of prostate
  - **Prostate cancer??**
Treatment algorithm for AAS
Check: lipids, Hct, T, HIV, hepatitis profile – initial visit

- FSH, LH, PRL, IGF-1, Hct, PSA, estradiol, lipids, testosterone, semen analysis, testicular volume

Suppression of LH, FSH
High testosterone, high estradiol
Compliant subject
Goals: reproduction?
Health concerns or spousal issues

Wishes paternity within 6 m
hCG x 6 months
SERM or AI
Follow FSH and compliance
12 months
Consider FSH or Repronex

Wishes paternity - future
Topical androgen scale down
SERM or AI
Follow LH and FSH and compliance
12 months

Normal hormonal evaluation
Cycling – already using SERM
Psychological counseling – contract of compliance

Change to topical testosterone if mood swings or withdrawals
Monitor FSH, LH
6-12 months – stop

Keep levels of total testosterone in upper normal range to help with compliance – withdrawal psychological

**Spermatogenesis**

- **Spermatogonia A**
  - Mitosis – renewal – 16 days

- **Spermatogonia B**

- **Spermatocyte I**
  - Meiosis I – 24 days

- **Spermatocyte II**
  - Meiosis II – hours

- **Spermatid**

- **Sperm**
  - 68-72 days from 1st division

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**LH/hCG increases T and E**

- LH/hCG

- FSH

- hCG

- FSH+hCG

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**Table:**

<table>
<thead>
<tr>
<th></th>
<th>Normal range</th>
<th>Before treatment</th>
<th>After treatment</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testosterone</td>
<td>270 - 1070 ng/dL</td>
<td>210 (+/- 50)</td>
<td>270 (+/- 70)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>IIEF-5</td>
<td>9.2 (+/- 6.3)</td>
<td>10.2 (+/- 7.2)</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

Treatment with human chorionic gonadotropin for PADAM: A preliminary report


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*Donadeu and Ascoli • Effects of LH/FSH in Granulosa Cells, Endocrinology 2005*
Reproduction: azoospermia

- Combined use of hCG and FSH – 3 months of therapy minimum – spontaneous pregnancy in 7 months - 75 units of FSH and 7,000-10,000 of hCG a week

- Use of IGF-1 or hGH does not seem to have negative side effects on spermatogenesis


Side effects of PEDs – lack of well controlled studies

- Consider ratio of anabolic v androgenic action
- Conversion to DHT – increase in prostate size – BPH – prostate cancer
- Conversion to estradiol – mood (depressed), suppression of LH/FSH, direct negative effect on spermatogenesis and steroidogenesis, possible negative effect on LDL and intimal internal carotid thickness, gynecomastia
- **KNOWN AND PROVEN V ANEGDOTAL**
  - Polycythemia: > 56% increased risk of cardiovascular events
    - May constitute urgent issue – phlebotomy 1 pint every 2 weeks – hematologist
  - > 4000 ng/dl – stroke – anecotal – possible T emboli
  - Acute mania – within 3 days from injections – psych consult – stop AI?
  - Depression – withdrawal – suicidal ideation – psych + continue treatment to keep upper normal level – compliance
    - Erectile dysfunction – 5PDE1 – improve compliance
  - Abscess from injection – MRSA likely – gym – Bactrim DS BID for 14 days – febrile admit – incise
  - Acne – start on doxycycline 100 mg BID for 28 days then mainaince 100 mg QD
    - May require retinoids topical or oral – dermatology consult
  - Cardiovascular effects may be dose and family hx dependent
  - Drop in HDL predominant finding
Differences in pharmacokinetics of injectable and topical preparations of testosterone - allow for transition treatment.

**Testosterone propionate**

**Intramuscular T**

**Topical testosterone**

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**Topical Testosterone and Fertility**

Transdermal testosterone gel increases serum testosterone levels in hypogonadal men in Taiwan with improvements in sexual function


Gonzalo, I. T. G. et al. J Clin Endocrinol Metab 2002;87:3562-3572

In men with hypogonadism testosterone replacement therapy with 5 gm of Androgel has no clinically significant effect on FSH and LH level. Significant clinical differences exist in effects of injectable and intramuscular testosterone on hypothalamic-pituitary-testicular axis.
**SELECTIVE ANDROGEN RECEPTOR MODULATORS**

Steroidal SARM

<table>
<thead>
<tr>
<th>Steroidal</th>
<th>Non-steroidal</th>
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<tbody>
<tr>
<td>Predominant anabolic activity used in muscle wasting in HIV patients</td>
<td></td>
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<tr>
<td>Oxandrolone - oral administration, not metabolized by 5-a-reductase weak anabolic activity</td>
<td></td>
</tr>
<tr>
<td>MENT - 10x androgenic, no metabolism by 5-a-reductase</td>
<td></td>
</tr>
<tr>
<td>7-Methyl-19-Nortestosterone Maintains Sexual Behavior and Mood in Hypogonadal Men, JCEM, 1999</td>
<td></td>
</tr>
<tr>
<td>Injectable</td>
<td></td>
</tr>
<tr>
<td>T undecanoate - oral administration</td>
<td></td>
</tr>
<tr>
<td>Aveed (Nebido) - 3 months injection</td>
<td></td>
</tr>
<tr>
<td>FDA raised safety concerns</td>
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</table>
Non-steroidal SARM

Andarine – anabolic but decreases prostate size in BPH


SELECTIVE ESTRADIOL RECEPTORS MODULATORS AS TREATMENT MODALITY
Estradiol and its Effects in Humans.

- Brain dimorphism and behavior
- Closure of long bones
- Bone mineral density
- Breast development
- Atherosclerosis
- Testicular function


Selectively Estrogen Receptor Modulators

- Clomiphene citrate (clomid)
  - Zuclophene
  - Enclomiphene
- Tamoxifen
- Raloxifene
SERMs Efficacy in Men Hypogonadism

Clomiphene citrate effects on testosterone/estrogen ratio in male hypogonadism.

SERMs are the most promising in near future as an alternative to testosterone and aromatase inhibitors - especially in men in reproductive age.

Effects of increased testosterone after SERM therapy on sexual function less clear

Clomiphene citrate –
Effects on semen analysis

- **42 patients azoospermia (25-39)**
  - Testosterone goal: 600 – 800 ng/dl
  - 64.3 % of patients had sperm in ejaculate 3.8 mil/ml
  - 35.7 % of patients had sperm in testicular biopsy
- **Hussein A. et al., J. Andrology, 2005**
- **65 mixed group of oligoasthenospermia 25 mg**
  - 3.8 to 8.2 mil/ml gr. I, and 13.05 to 24.55 mil/ml gr.II
  - Minimal effect on morphology
- **3 patients with oligospermia**
  - Treatment for 3 months and follow up semen analysis
  - All 3 azoospermic
  - Clomiphene stopped
  - All 3 had return of sperm in ejaculate
Aromatase inhibitors:

- **Group I: irreversible:**
  - Exemestane - Aromasin®
  - Formestane and Testolactone – less commonly used
  - 4-Androstene-3,6,17-trione (4-etioallocholen-3,6,17-trione)
  - 1,4,6-androstatrien-3,17-dione

- **Group II: reversible:**
  - Anastrozole, Arimidex® - half life 72 hours, bioavailability >80%
  - Letrozole – Femara®

- **Group III: broad inhibitors**
  - Aminoglutethimide

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Optimal Dose of Anastrozole

Leder *et al.* • Aromatase Inhibition in Elderly Men, JCEM, 2004
Anastrozole – Semen Parameters

- No change in semen parameters
  - Treatment of men with idiopathic oligozoospermic infertility using the aromatase inhibitor, testolactone. Results of a double-blinded, randomized, placebo-controlled trial with crossover. Clark, J. Andrology, 1989
    - 25 men – oligospermia 8 months
    - Increase in testosterone but no change in semen
- Positive change in semen parameters
  - Aromatase inhibitors for male infertility. Raman and Schlegel, J.Urol 2002
    - 140 men with infertility testolactone and arimidex, elevated E/T ratio
    - 5.5 mil/ml to 15.6 mil/ml
    - 832.8 versus 2930.8 million motile sperm per ejaculate
    - no increase in testosterone level

SERMs, aromatase inhibitors are highly effective in restoring suppression of hypothalamic-pituitary LH and FSH

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>95% CI</th>
<th>Minimum</th>
<th>Maximum</th>
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<td></td>
<td></td>
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<td>Lower Bound</td>
<td>Upper Bound</td>
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<tr>
<td>Clomiphene</td>
<td>15</td>
<td>573.60</td>
<td>463.68</td>
<td>683.52</td>
<td>332</td>
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<tr>
<td>Anastrozole</td>
<td>15</td>
<td>493.87</td>
<td>403.98</td>
<td>583.75</td>
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<tr>
<td>Topical testosterone 1%</td>
<td>15</td>
<td>630.20</td>
<td>457.05</td>
<td>803.35</td>
<td>202</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>565.89</td>
<td>495.29</td>
<td>636.49</td>
<td>202</td>
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</table>
Body dysmorphic disorder v normal desire to look better

- Psychiatric disorder
- **body dysmorphia, dysmorphic syndrome; dysmorphophobia 300.7**
- Affected person is concerned with body image – main area of concern
- Manifested as excessive concern about and preoccupation with a perceived defect of their physical features – often minors
- The person thinks they have a defect in either one feature or several features of their body – multiple plastic surgeries
- Psychological distress that causes clinically significant distress or impairs occupational or social functioning
- Often BDD co-occurs with depression and anxiety, social withdrawal or social isolation

Pathophysiology

- Internal perceptual discrepancy between the person's
  - *actual self* and the *ideal self*
  - atypical aesthetic-standards
  - body image develops either in adolescence or in early adulthood

- Biological, psychological, and environmental etiology
- Psychological trauma stemming from mental and physical abuse, or emotional neglect
- Depression, social phobia, and obsessive compulsive disorder, sexual intimacy issues
- Dissociation/conversion disorder and **suicidal ideation seen in 80% of clients**
- Dissociation wide array of experiences from mild detachment from immediate surroundings to more severe detachment from physical and emotional experience of our own body – client feels he doesn’t belong
Associated symptoms

- Obsessive thoughts about (a) perceived appearance defect(s).
- **Obsessive and compulsive behaviors** related to (a) perceived appearance defect(s) – seeking reassurance
- Major depressive disorder symptoms.
- Delusional thoughts and beliefs related to (a) perceived appearance defect(s).
- Social and family withdrawal, **social phobia, loneliness** and self-imposed social isolation.
- Suicidal ideation.
- Anxiety; possible panic attacks.
- Chronic low self-esteem.
- Feeling self-conscious in social environments; thinking that others notice and mock their perceived defect(s).
- Strong feelings of shame.
- **Avoidant personality**: avoiding leaving the home or only leaving the home at certain times.
- Dependent personality: dependence on others, such as a partner, friend or family.
- Inability to work or an inability to focus at work due to preoccupation with appearance
- **Problems initiating and maintaining relationships (both intimate relationships and friendships).**
- Alcohol and/or drug abuse (often an attempt to self-medicate).
- Repetitive behavior (such as constantly (and heavily) applying make-up; regularly checking appearance in mirrors)
- Seeing slightly varying image of self upon each instance of observing a mirror or reflective surface.
- Perfectionism (undergoing cosmetic surgery and behaviors such as excessive moisturizing and exercising with the aim to achieve an ideal/better type and reduce anxiety).
- Body modification may change one’s appearance. There are many types of body modification that do not include surgery/cosmetic surgery. Body modification (or related behavior) may seem compulsive, repetitive, or focused on one or more areas or features that the individual perceives to be defective.

Risk factors

- **Low levels of serotonin in the brain – SSRIs**
- Teasing or criticism regarding appearance could play a contributory role in the onset of BDD. While it is unlikely that teasing causes BDD, likewise, extreme levels of childhood abuse, bullying and psychological torture are often rationalized and dismissed as "teasing," sometimes leading to traumatic stress in vulnerable persons.
- Around 60% of people with BDD report frequent or chronic childhood teasing.
- Parenting style parents who either place excessive emphasis on aesthetic appearance, or disregard it altogether, may act as a trigger in the genetically predisposed.
- Other life experiences: neglect, physical and/or sexual trauma, insecurity and rejection.
- **Lack of objective point of reference – lack of father or father figure**
- Media pressure may contribute to BDD onset; for example, glamour models and the implied necessity of aesthetic beauty. However, BDD occurs in all parts of the world, including isolated areas where access to media is limited or (practically) non-existent. Media pressure is therefore an unlikely cause of BDD, although it may act as a trigger in those already genetically predisposed or could worsen existing BDD symptoms.
COUNSELING IS AS IMPORTANT AS HORMONAL TREATMENT

- Studies have found that cognitive behavior therapy (CBT) is effective in the majority of cases. In a study of 54 BDD patients who were randomly assigned to cognitive behavior therapy or no treatment, BDD symptoms decreased significantly in those patients undergoing CBT. BDD was eliminated in 82% of cases at post treatment and 77% at follow-up.

- Since BDD is believed to be linked to low serotonin levels in the brain, SSRIs (selective serotonin reuptake inhibitors) and other antidepressants are commonly prescribed. 74 subjects were enrolled in a placebo-controlled study group to evaluate the efficiency of fluoxetine (Prozac); patients were enrolled in a 12-weeks, double-blind, randomized study. At the end of treatment, 53% of patients responded to fluoxetine (with 18% of patients responding to the placebo).

- A combined approach of cognitive behavior therapy (CBT) and antidepressants is more effective than either alone. The dose of a given antidepressant is usually more effective when it exceeds the maximum recommended doses that are given for obsessive compulsive disorder (OCD) or a major depressive episode.[citation needed]

- If a person becomes aware that they have BDD then it is also possible to overcome the problem with regular positive self-affirmations and to acknowledge that the "defects" they have convinced themselves of are not an issue. Although this is dependent on the environment in which one lives as bullying, harassment and other negative influences would counteract or hinder progress in developing personal self-confidence.

Cognitive behavioral therapy – important part of treatment

- Psychotherapeutic not psychoanalytical approach
- Addresses dysfunctional emotions, maladaptive behaviors and cognitive processes and contents through a number of goal-oriented, explicit systematic procedures
- This technique acknowledges that there may be behaviors that cannot be controlled through rational thought.

- CBT is "problem focused" (undertaken for specific problems) and "action oriented" (therapist tries to assist the client in selecting specific strategies to help address those problems).

- Focus on the "here and now", a directive or guidance role of the therapist, a structuring of the psychotherapy sessions and path, and on alleviating both symptoms and patients' vulnerability
- Write down 5 positives about your body and yourself each morning
- Reality check – normal anatomy
- Focus on positive experiences - quality of erection on date, partners complaint
- Identify reasons for abnormal body image – childhood – peers
Body image disorder – genital area

OVERALL – 500 pts plastics
- Skin (73%)
- Hair (56%)
- Nose (37%)
- Weight (22%)
- Stomach (22%)
- Breasts/chest/nipples (21%)
- Eyes (20%)
- Thighs (20%)
- Teeth (20%)
- Legs (overall) (18%)
- Body build/bone structure (16%)
- Facial features (general) (14%)
- Face size/shape (12%)
- Lips (12%)
- Genitals (8%)

• MEN
  - Dissatisfied with appearance (43%)
  - Often present to non-psychiatric physicians, with reported rates of 12% in dermatology settings and 7-15% in cosmetic surgery settings
  - Muscle dysmorphia, a preoccupation that one’s body is too small, “puny,” and inadequately muscular.
  - In reality, many of these men are unusually muscular and large
  - SF-36 - health related quality of life, outpatients with body dysmorphic disorder - worse in all mental health domains than the general US population and patients with depression, diabetes, or a recent myocardial infarction

OUR ROLE AS ENDOCRINOLOGISTS

- Best suited to understand metabolic consequences and provide successful treatment
- “STOP and see me when you are clean” – is dangerous, unethical, not-effective
- YOU AS A PATIENT STOP – because … health, legal, economic consequences
- I AS PHYSICIAN WILL - supplement and restore normal function, explain timing
- YOUR ROLE AS A PATIENCE – compliance with treatment regiment
- ACCEPT NEED FOR REFERRAL AND SUPPORT
  - Psychiatry/psychological evaluation and treatment – with endocrinologic treatment
  - Dermatology – acne
  - Sexual medicine – high prevalence of erectile dysfunction

- AAS ABUSE – IS ENDOCRINE DISEASE