TRANSICIÓN HORMONAL

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- Conflicto de interés:
  - SOCHED
  - Apoyo en pasantía en el extranjero 2016
  - UZ Gante-Bélgica

Agenda

- **Introducción**
- Criterios de elección
- Tratamiento hormonal
- Efectos deseados
- Seguimiento
- Efectos adversos

- **Trans-masculino: (FTM)**

- **Trans-mujer: (MTF)**

Presentación clínica

- Testimonio personal:85% etapa pre-puberal
- 50% vivían como el género deseado.
- 20% recibían Terapia Hormonal previo a consultar (automedicada)

- **Diagnóstico tardío**
- **Uso/abuso hormonal no-supervisado es frecuente**
- **IMPORTANCIA DEL TRATAMIENTO OPORTUNO**

- Reiner WG. Gender identity and sex-of-rearing in children with disorders of sexual differentiation. J Pediatr Endocrinol Metab 2005.
- Steensma TD, et al. Desisting and persisting gender dysphoria after childhood: a qualitative follow-up study. Clin Child Psychol Psychiatry 2011.

Agenda

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Endocrine Treatment of Transsexual Persons: An Endocrine Society Clinical Practice Guideline

JCEM 2017.

- El cambio de sexo es un tratamiento multidisciplinario. Requiere 5 procesos integrados:

- Atención primaria	- Psiquiatra	- Cirujano de mamas
- Ginecología	- Psicólogo	- Endocrinólogo
- Urología	- Fonoaudiólogo	- Nutricionista
- Fertilidad	- Otorrino	- Asistente social
	- Cirujano plástico	

5. Tratamiento quirúrgico

Niñez

- Seguimiento por
  - Psiquiatra-psicólogo
  - Apoyo psicosocial
  - Pediatra-Endocrino

Table 6. Tanner Stages of Breast Development and Male External Genitalia

The description of Tanner stages for breast development:

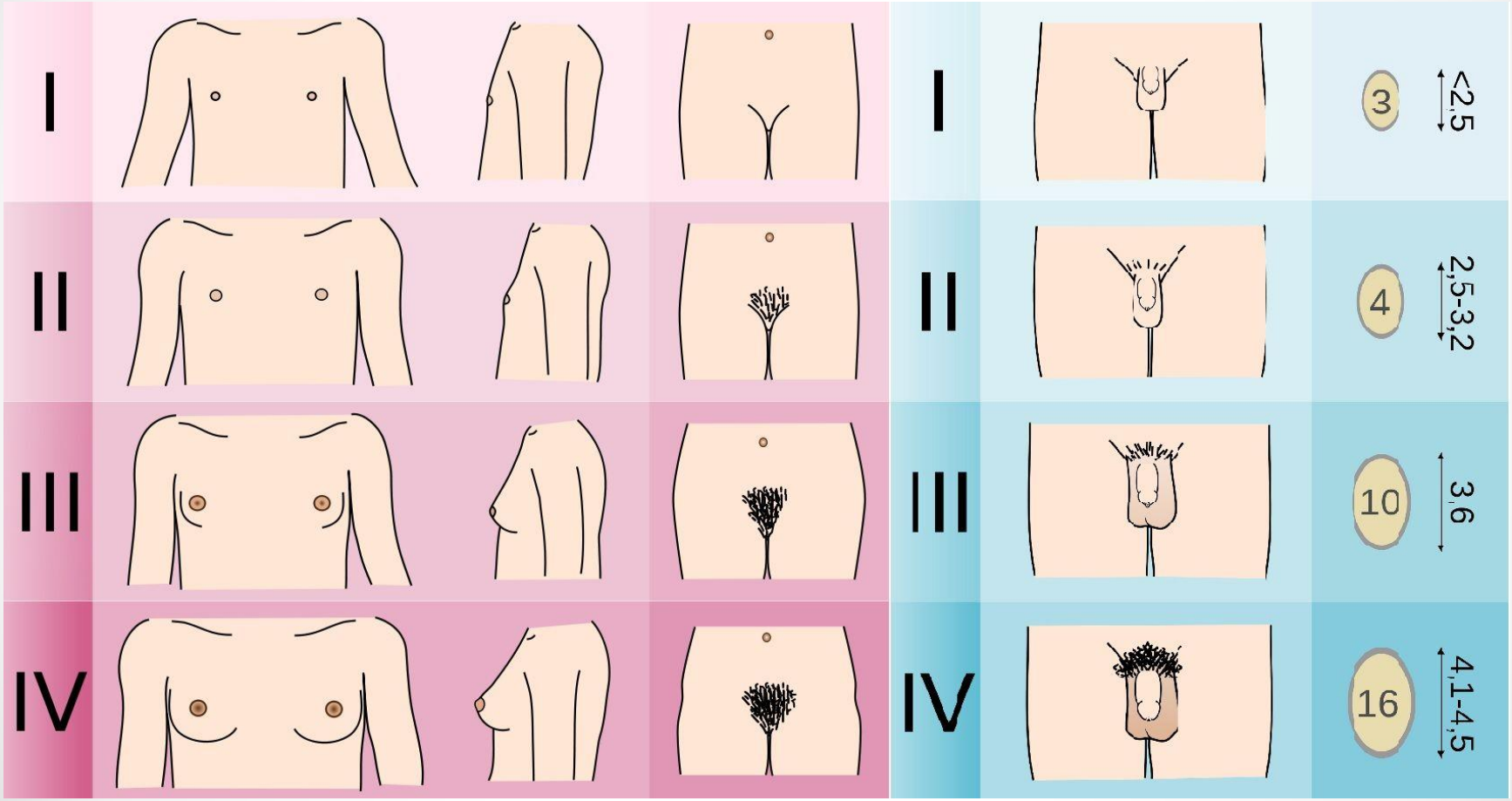
1. Prepubertal
2. Breast and papilla elevated as small mound; areolar diameter increased
3. Breast and areola enlarged, no contour separation
4. Areola and papilla form secondary mound
5. Mature; nipple projects, areola part of general breast contour

For penis and testes:

1. Prepubertal, testicular volume <4 mL
2. Slight enlargement of penis; enlarged scrotum, pink, texture altered, testes 4–6 mL
3. Penis longer, testes larger (8–12 mL)
4. Penis and glans larger, including increase in breadth; testes larger (12–15 mL), scrotum dark
5. Penis adult size; testicular volume > 15 ml

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Estadio de Tanner



Criterios para iniciar agonistas GnRH

- **Personal de Salud Mental confirma:**
  - Periodo prolongado e intensivo de disforia
  - Disforia empeora con la pubertad
  - Coexistencia de un problema psicológico, debe ser identificado y tratado antes de empezar tratamiento
  - Que el adolescente tenga la capacidad mental para entender el tratamiento

- **El adolescente**
  - Informado , incluyendo fertilidad
  - Dar consentimiento junto con los padres

- **Endocrinólogo con experiencia**
  - De acuerdo con el tratamiento
  - Confirmar Tanner 2
  - No existan contraindicaciones

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Criterios para iniciar Tratamiento hormonal cruzado

Hormonas del género deseado

- **Personal de Salud Mental confirma:**
  - Persistencia de disforia
  - Conocimiento de algún problema psicológico o social coexistente, sea estable o no interfiera con el tto.
  - Que el adolescente tenga la capacidad mental para entender el tratamiento

- **El adolescente**
  - Informado , incluyendo fertilidad
  - Dar consentimiento junto con los padres

- **Endocrinólogo con experiencia**
  - De acuerdo con el tratamiento
  - No existan contraindicaciones

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Criterios para iniciar tratamiento hormonal en adultos

Table 4. Criteria for Gender-Affirming Hormone Therapy for Adults

1. Persistent, well-documented gender dysphoria/gender incongruence
2. The capacity to make a fully informed decision and to consent for treatment
3. The age of majority in a given country (if younger, follow the criteria for adolescents)
4. Mental health concerns, if present, must be reasonably well controlled

Reproduced from World Professional Association for Transgender Health (16).

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Criterios:

- Antecedentes familiares
  - Cáncer
  - Enf cardiovasculares
  - Enf tromboembólicas
- Antecedentes personales
  - Tabaco
  - Hábitos de vida
- Exámenes laboratorio:
- Otros:
  - Ideal DMO DXA

1. Hemograma
2. Perfil lipídico
3. Pruebas hepáticas
4. Curva de glucosa e insulina
5. Función renal
6. FSH-LH
7. Estradiol
8. Testosterona
9. SHBG
10. Prolactina
11. Vitamina D
12. Met Ca y P

Riesgos y contraindicaciones

Table 10. Medical Risks Associated With Sex Hormone Therapy

Transgender female: estrogen
- Very high risk of adverse outcomes:
  - Thromboembolic disease
- Moderate risk of adverse outcomes:
  - Macroprolactinoma
  - Breast cancer
  - Coronary artery disease
  - Cerebrovascular disease
  - Cholelithiasis
  - Hypertriglyceridemia

Transgender male: testosterone
- Very high risk of adverse outcomes:
  - Erythrocytosis (hematocrit > 50%)
- Moderate risk of adverse outcomes:
  - Severe liver dysfunction (transaminases
  - Coronary artery disease
  - Cerebrovascular disease
  - Hypertension
  - Breast or uterine cancer

Contraindicaciones

- Tumor- hormono dependiente
- Falla hepática
- Policitemia no tratada
- Embarazo
- C . Coronaria inestable

- J W Jacobeit et al. Safety aspects of 36 months of administration of long-acting intramuscular testosterone undecanoate for treatment of female-to-male transgender individuals. European Journal of Endocrinology 2009.
- Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Fertilidad

Reproductive options in trans men

- Egg-cell freezing: ovarian stimulation with egg-cell retrieval
  - IVF in female partner
  - IVF in surrogate mother if male partner
  - Intensive and invasive procedure
- Ovarian tissue freezing
  - Experimental
  - No pregnancies reported
  - Study protocol to store ovarian tissue at time of sex reassignment surgery (after 12mths of testosterone therapy)

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Tratamiento hormonal: Adolescentes

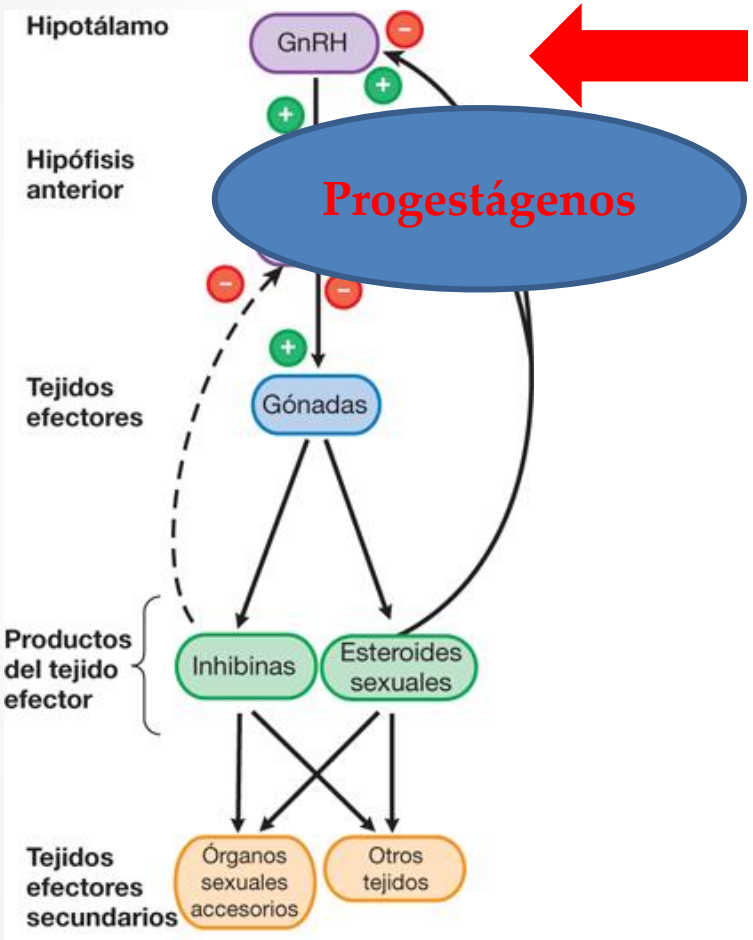
Pubertad → **Caracteres sexuales 2°**

Hombre: talla alta, crecimiento acral, manzana de Adán,masculinización de la voz, ↑vello, desarrollo genital.
Mujer: talla baja, desarrollo mamario, menstruación.

- Objetivo principal → **Disminuir la disforia del paciente**.
  - Suspender del desarrollo puberal
  - Evitar aparición de caracteres sexuales secundarios irreversibles del sexo biológico.
  - Inducir cambios puberales del sexo deseado.

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

¿Cómo suprimir la pubertad?



Fuente: Randa Hilal-Dandan, Laurence L. Brunton: *Goodman & Gilman. Manual de farmacología y terapéutica*, 2e: www.accessmedicina.com

Análogos GnRH:
Estimulación crónica

⇩

Frenan los pulsos de LH y FSH

- Se utilizan: tratamiento de la pubertad precoz

Supresión puberal : Tanner II-III

- **Análogos de GnRh** →
  - efectivos
  - reversible
  - pocos efectos adversos
  - alto costo

- **Progestágenos** →
  - menor costo
  - efecto reversible
  - < efectivos
  - riesgo empeorar síntomas anímicos

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Supresión con análogos GnRH

- Lupron Depot 11,25mg c/90d IM.
- Lupron Depot 22.5 mg c/90d IM.
- Lupron Depot 7.5 mg c/30d IM.

- Protocolo Holandeses
  - Triptorelina (Decapeptyl) 3, 75 mg
  - 0-2,4 semanas
  - Luego cada 4 semanas

Schagen, S. et al. Efficacy and Safety of Gonadotropin-Releasing Hormone Agonist. Treatmente to Suprres Puberty in Gender Dysphoric Adolescents. J Sex Med 2016.

Inducción puberal del género deseado

- Mantener análogos de GnRH

TRANS MUJERES

- **Dosis iniciales insuficientes → eje**
- **Cuanto tiempo usar análogos??**
- **GnRH mas testo endógena: interfiere con efecto del estrógeno**
- **Utilizar anti andrógenos**

TRANS HOMBRES

- **Suspender GnRH**
  - **Dosis plena de testo**
- **Sangrado**
  - **Progestágeno**

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.
De Ronde W, et al. Effects of oestradiol on gonadotrophin lleves in normal and castrated men. Clin Endocrinol. 2009.

Young Adult Psychological Outcome After Puberty Suppression and Gender Reassignment

De Vries, et al. Pediatrics 204.

Disforia persistió

TABLE 1 Age at Different Treatment Milestones and Intelligen

Variable	All Participants[a] (*N* = 55)		Transwomen (Natal Males) (*N* = 22)	Transmen (Natal Females) (*N* = 33)
Age, y	Mean (SD)	Range	Mean (SD)	Mean (SD)
At assessment PreT	13.6 (1.9)	11.1–17.0	13.6 (1.8)	13.7 (2.0)
At start of GnRHa	14.8 (1.8)	11.5–18.5	14.8 (2.0)	14.9 (1.9)
At start of CSH	16.7 (1.1)	13.9–19.0		
At GRS	19.2 (0.9)	18.0–21.3		
At assessment PostT	20.7 (1.0)	19.5–22.8		
Full-scale intelligence[b]	99.0 (14.3)	70–128		

PostT, post-treatment; PreT, pre-treatment.

[a] Comparisons between those who had complete data (*n* = 40) and those who had mis
point in the study or in natal sex.

[b] WISC-R, the WISC-III, or the WAIS-III at first assessment, depending on age and time.

- Disforia resuelta
- Bienestar ≥ población en general
- No arrepentimiento

Table 8. Protocol Induction of Puberty

Induction of female puberty with oral 17β-estradiol, increasing the dose every 6 mo:
- 5 μg/kg/d
- 10 μg/kg/d
- 15 μg/kg/d
- 20 μg/kg/d
- Adult dose = 2–6 mg/d
- *In postpubertal transgender female adolescents, the dose of 17β-estradiol can be increased more rapidly:*
  - 1 mg/d for 6 mo
  - 2 mg/d

Induction of female puberty with transdermal 17β-estradiol, increasing the dose every 6 mo (new patch is placed every 3.5 d):
- 6.25–12.5 μg/24 h (cut 25-μg patch into quarters, then halves)
- 25 μg/24 h
- 37.5 μg/24 h
- Adult dose = 50–200 μg/24 h
- *For alternatives once at adult dose, see Table 11.*
- *Adjust maintenance dose to mimic physiological estradiol levels (see Table 15).*

Induction of male puberty with testosterone esters increasing the dose every 6 mo (IM or SC):
- 25 mg/m^2/2 wk (or alternatively, half this dose weekly, or double the dose every 4 wk)
- 50 mg/m^2/2 wk
- 75 mg/m^2/2 wk
- 100 mg/m^2/2 wk
- Adult dose = 100–200 mg every 2 wk
- *In postpubertal transgender male adolescents the dose of testosterone esters can be increased more rapidly:*
  - 75 mg/2 wk for 6 mo
  - 125 mg/2 wk
- *For alternatives once at adult dose, see Table 11.*
- *Adjust maintenance dose to mimic physiological testosterone levels (see Table 14).*

Adapted from Hembree *et al.* (118).

Abbreviations: IM, intramuscularly; SC, subcutaneously.

Tratamiento hormonal en adultos: objetivos

1) Suprimir las hormonas del sexo natal

2) Inducir caracteres secundarios del nuevo sexo

Alcanzado el objetivo

- ✓ Mantener niveles hormonales dentro del rango fisiológico normal
- ✓ Continuar tratamiento, incluso post gonadectomía
- ✓ Psicoterapia

ANTES DE INICIAR TRATAMIENTO

CONSIERAR FERTILIDAD

Trans mujer: Hombre a Mujer

A. Supresión de secreción y acción de andrógenos

- Antiandrógenos:
  - Espironolactona
  - Ciproterona
- Progestinas: → Medroxiprogesterona
- Agonistas de GnRH
- Otros:
  - Finasteride
  - Flutamida

No hay datos
Aumentan GnRH
NO

B. Administración de estrógenos

Table 11. Hormone Regimens in Transgender Persons

Transgender females[a]		
Estrogen		
Oral		
Estradiol		2.0–6.0 mg/d
Transdermal		
Estradiol transdermal patch (New patch placed every 3–5 d)		0.025–0.2 mg/d
Parenteral		
Estradiol valerate or cypionate		5–30 mg IM every 2 wk 2–10 mg IM every week
Anti-		
Sp		
Cy		
GnR		hly nthly

- **> 40 años**
- **Factores riesgo**

Etinil estradiol:
- **Más potente**
- **Dosis: 50 a 100 mcg/día**
- **> Riesgo TVP y CV**

NO RECOMENDADO

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Trans hombre: Mujer - Hombre

Objetivos: Detener menstruación e inducir virilización

Table 11. Hormone Regimens in Transgender Persons

Transgender males	
Testosterone	
Parenteral testosterone	
Testosterone enanthate or cypionate	100–200 mg SQ (IM) every 2 wk or SQ (SC) 50% per week
Testosterone undecanoate[c]	1000 mg every 12 wk
Transdermal testosterone	
Testosterone gel 1.6%[d]	50–100 mg/d
Testosterone transdermal patch	2.5–7.5 mg/d

Abbreviations: IM, intramuscularly; SQ, sequentially; SC, subcutaneously.

[a]Estrogens used with or without antiandrogens or GnRH agonist.

[b]Not available in the United States.

[c]One thousand milligrams initially followed by an injection at 6 wk then at 12-wk intervals.

[d]Avoid cutaneous transfer to other individuals.

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Menstruación

- Solo con la testosterona → frenar
- Medroxiprogesterona 5-10 g/día
- Agonistas GnRH
- Medroxiprogesterona depósito
- Ablación endometrio

Sylie C, et al. Endocrine Treatment of Transsexual Persons:An Endocrine Society clinical Practice guideline.Jour Clin Endoc. 2009.

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7


13


15

Cross-Gender Hormone Therapy in Adolescents

[*Pediatr Ann.* 2014; 43(6):e138–e144.]

TH

TM

Effects of Cross-Gender Hormones

Effect	Onset (Months)	Maximum (Years)	Reversible?
Masculinizing effects of testosterone			
Skin—acne	1 to 6	1 to 2	Yes
Facial—body hair	6 to 12	4 to 5	No
Scalp hair loss	6 to 12	–	No
Increased muscle mass	6 to 12	2 to 5	Yes
Fat redistribution	1 to 6	2 to 5	Yes
Cessation of menses	2 to 6	–	Yes
Clitoral enlargement	3 to 6	1 to 2	No
Vaginal atrophy	3 to 6	1 to 2	Yes
Deepening of voice	6 to 12	1 to 2	No
Feminizing effects of estrogen			
Redistribution of body fat	3 to 6	2 to 3	Yes
Decreased muscle mass	3 to 6	1 to 2	Yes
Softening of skin	3 to 6	Unknown	Yes
Decreased libido	1 to 3	3 to 6	Yes
Decreased spontaneous erections	1 to 3	3 to 6	Yes
Breast growth	3 to 6	2 to 3	No
Decreased testicular volume	3 to 6	2 to 3	No
Decreased sperm production	Unknown	>3	Yes
Decreased terminal hair growth	6 to 12	>3	Yes

Efectos clínicos:

NO REVERSIBLES:

- Talla
- Tamaño manos-pies
- Mandíbula
- Pelvis
- Voz
- Prominencia laríngea

TABLE 14. Feminizing effects in MTF transsexual persons

Effect	Onset[a]	Maximum[a]
Redistribution of body fat	3–6 months	2–3 yr
Decrease in muscle mass and strength	3–6 months	1–2 yr
Softening of skin/decreased oiliness	3–6 months	Unknown
Decreased libido	1–3 months	3–6 months
Decreased spontaneous erections	1–3 months	3–6 months
Male sexual dysfunction	Variable	Variable
Breast growth	3–6 months	2–3 yr
Decreased testicular volume	3–6 months	2–3 yr
Decreased sperm production	Unknown	>3 yr
Decreased terminal hair growth	6–12 months	>3 yr[b]
Scalp hair	No regrowth	[c]
Voice changes	None	[d]

[a] Estimates represent clinical observations. See Refs. 81, 92, and 93.

[b] Complete removal of male sexual hair requires electrolysis, or laser treatment, or both.

[c] Familial scalp hair loss may occur if estrogens are stopped.

[d] Treatment by speech pathologists for voice training is most effective.

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Efectos clínicos

NO REVERSIBLES

- Talla
- Cadera
- Mama: atrofia

TABLE 13. Masculinizing effects in FTM transsexual persons

Effect	Onset (months)[a]	Maximum (yr)[a]
Skin oiliness/acne	1–6	1–2
Facial/body hair growth	6–12	4–5
Scalp hair loss	6–12	[b]
Increased muscle mass/strength	6–12	2–5
Fat redistribution	1–6	2–5
Cessation of menses	2–6	[c]
Clitoral enlargement	3–6	1–2
Vaginal atrophy	3–6	1–2
Deepening of voice	6–12	1–2

[a] Estimates represent clinical observations. See Refs. 81, 92, and 93.

[b] Prevention and treatment as recommended for biological men.

[c] Menorrhagia requires diagnosis and treatment by a gynecologist.

- Niveles de testosterona: 400-1000ng/dl
- LH/FSH – estradiol bajos

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

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Table 7. Baseline and Follow-Up Protocol During Suppression of Puberty

Every 3–6 mo
Anthropometry: height, weight, sitting height, blood pressure, Tanner stages
Every 6–12 mo
Laboratory: LH, FSH, E2/T, 25OH vitamin D
Every 1–2 y
Bone density using DXA
Bone age on X-ray of the left hand (if clinically indicated)

Adapted from Hembre

Abbreviations: DXA, hormone; T, testosterone;

- **Seguimiento con Salud Mental**
- **Hábitos**
- **Educación**
  - **Familia**
  - **Colegio**
  - **Medio**

Table 9. Basel

Every 3–6 mo
•Anthropometry
Every 6–12 mo
•In transgender
•In transgender
Every 1–2 y
•BMD using DXA
•Bone age on X-ray of the left hand (if clinically indicated)

BMD should be monitored into adulthood (until the age of 25–30 y or until peak bone mass has been reached).
For recommendations on monitoring once pubertal induction has been completed, see Tables 14 and 15.

Adapted from Hembree *et al.* (118).

Abbreviation: DXA, dual-energy X-ray absorptiometry.

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Seguimiento

Table 15. Monitoring of Transgender Persons on Gender-Affirming Hormone Therapy: Transgender Female

1. Evaluate patient every 3 mo in the first year and then one to two times per year to monitor for appropriate signs of feminization and for development of adverse reactions.
2. Measure serum testosterone and estradiol every 3 mo.
   a. Serum testosterone levels should be <50 ng/dL.
   b. Serum estradiol should not exceed the peak physiologic range: 100–200 pg/mL.
3. For individuals on spironolactone, serum electrolytes, particularly potassium, should be monitored every 3 mo in the first year and annually thereafter.
4. Routine cancer screening is recommended, as in nontransgender individuals (all tissues present).
5. Consider BMD testing at baseline (160). In individuals at low risk, screening for osteoporosis should be conducted at age 60 years or in those who are not compliant with hormone therapy.

This table presents strong recommendations and does not include lower level recommendations.

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

Seguimiento

Table 14. Monitoring of Transgender Persons on Gender-Affirming Hormone Therapy: Transgender Male

1. Evaluate patient every 3 mo in the first year and then one to two times per year to monitor for appropriate signs of virilization and for development of adverse reactions.
2. Measure serum testosterone every 3 mo until levels are in the normal physiologic male range:[a]
   a. For testosterone enanthate/cypionate injections, the testosterone level should be measured midway between injections. The target level is 400–700 ng/dL to 400 ng/dL. Alternatively, measure peak and trough levels to ensure levels remain in the normal male range.
   b. For parenteral testosterone undecanoate, testosterone should be measured just before the following injection. If the level is <400 ng/dL, adjust dosing interval.
   c. For transdermal testosterone, the testosterone level can be measured no sooner than after 1 wk of daily application (at least 2 h after application).
3. Measure hematocrit or hemoglobin at baseline and every 3 mo for the first year and then one to two times a year. Monitor weight, blood pressure, and lipids at regular intervals.
4. Screening for osteoporosis should be conducted in those who stop testosterone treatment, are not compliant with hormone therapy, or who develop risks for bone loss.
5. If cervical tissue is present, monitoring as recommended by the American College of Obstetricians and Gynecologists.
6. Ovariectomy can be considered after completion of hormone transition.
7. Conduct sub- and periareolar annual breast examinations if mastectomy performed. If mastectomy is not performed, then consider mammograms as recommended by the American Cancer Society.

[a] Adapted from Lapauw *et al.* (154) and Ott *et al.* (159).

Hembree C. et al. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons:AN Endocrine Society. Clinical Practice Guideline. J Clin Endocrinol Metab. Noviembre 2017.

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Supresión con análogos GnRH

- HTA
- Bochornos
- Fatiga
- Alteraciones del ánimo
- BMI

Pubertad precoz

Table 1. Baseline characteristics and changes in anthropometric measurements and body composition during the first year of GnRHa treatment*

	MtF		*P* value	FtM		*P* value
Age (y), median (range)	13.6 (11.6–17.9)			14.2 (11.1–18.6)		NS
Tanner G and B stages, median (range)	4 (2–5)			4 (2–5)		NS
Menarche	N/A			49/65 (77%)		
	Start GnRHa	1 y GnRHa		Start GnRHa	1 y GnRHa	
Height (cm), mean (SD)	167.8 (7.5)	172.3 (6.5)	<.001	161.4 (8.4)	163.5 (7.9)	<.001
n	36	36		41	41	
Height SDS, mean (SD)	0.20 (1.0)	−0.04 (1.0)	<.001	−0.10 (1.1)	−0.25 (1.1)	<.001
n	36	36		41	41	
Weight (kg), mean (SD)	57.4 (11.1)	63.3 (11.9)	<.001	55.1 (14.7)	59.5 (14.4)	<.001
n	36	36		41	41	
BMI (kg/m^2), mean (SD)	20.3 (3.0)	21.2 (3.2)	<.001	21.0 (4.5)	22.1 (4.6)	<.001
n	36	36		41	41	
BMI SDS, mean (SD)	0.82 (1.1)	0.89 (1.2)	NS	0.68 (1.2)	0.84 (1.2)	.01
n	36	36		41	41	
Fat percentage (%), mean (SD)	22.4 (6.9)	26.8 (6.6)	<.001	25.0 (6.9)	29.5 (7.3)	<.001
n	26	26		27	27	
Lean body mass (%), mean (SD)	74.6 (6.4)	70.9 (7.3)	.001	71.5 (6.7)	67.7 (6.7)	<.001
n	26	26		27	27	
Testicular volume (mL), median (range)	13.5 (4–25)	8 (2.5–22.5)	<.001	N/A		
n	33	33				
AP (U/L), mean (SD)	303 (109)	216 (79)	<.001	215 (101)	168 (58)	<.001
n	19	19		21	21	
Creatinine (μmol/L), mean (SD)	70 (12)	66 (13)	NS	73 (8)	68 (13)	.01
n	28	28		29	29	

AP = alkaline phosphatase; B stage = breast stage; BMI = body mass index; FtM = female-to-male; G stage = genital stage; GnRHa = gonadotropin-releasing hormone agonist; MtF = male-to-female; N/A = not applicable; NS = not significant; SDS = SD score.
*Baseline characteristics are shown for all included patients. Where data at the start of treatment are compared with data after 1 year of treatment, results are shown of individuals from whom data were available at the two time points.

Schagen, S. et al. Efficacy and Safety of Gonadotropin-Releasing Hormone Agonist. Treatmente to Suprres Puberty in Gender Dysphoric Adolescents. J Sex Med 2016.

Bone Mass in Young Adulthood Following Gonadotropin-Releasing Hormone Analog Treatment and Cross-Sex Hormone Treatment in Adolescents With Gender Dysphoria

Daniel Klink, Martine Caris, Annemieke Heijboer, Michael van Trotsenburg, and Joost Rotteveel

J Clin Endocrinol Met 2015.

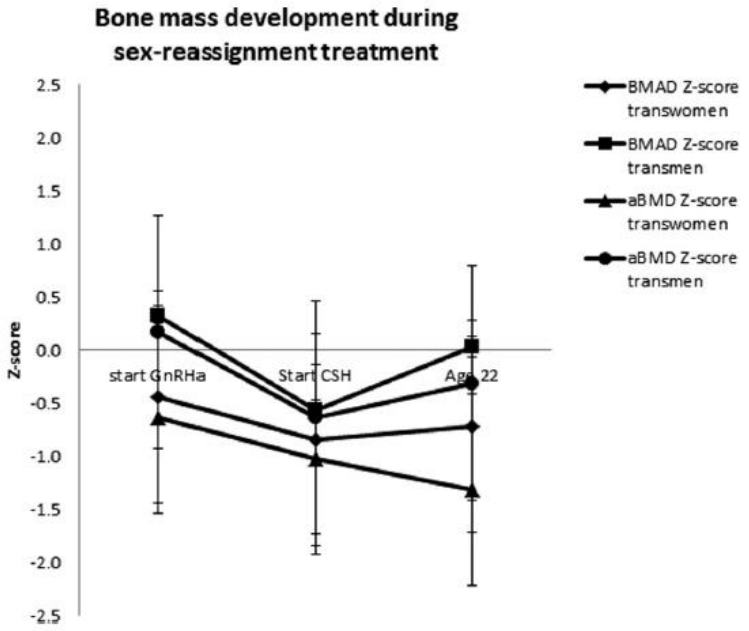


Figure 1. Longitudinal *z*-score (mean ± SD) development of the LS from start medical treatment until the age of 22 years in transmen and transwomen.

- Dieta
- Niveles Vitamina D
- Ejercicio

- Mas estudios
- Empezar a los 16 años

Cross-Sex Hormones and Metabolic Parameters in Adolescents With Gender Dysphoria

Jason Jarin, MD,[a] Elyse Pine-Twaddell, MD,[b,c] Gylynthia Trotman, MD,[d] Jaime Stevens, MD,[b] Lee Ann Conard, DO,[d] Eshetu Tefera, MS,[e] Veronica Gomez-Lobo, MD[f]

Pediatrics 2017

TABLE 3 Mean Metabolic and Anthropometric Data for Affirmed Female Adolescents

Variable	Baseline (*n*)	1–3 mo (*n*)	4–6 mo (*n*)	Beyond 6 mo (*n*)
BMI	23.7 (38)	23.0 (21)	23.6 (21)	23.6 (25)
SBP, mm Hg	125 (42)	124 (29)	121 (28)	121 (29)
DBP, mm Hg	72 (42)	74 (29)	72 (28)	72 (29)
Hematocrit, %	43.8 (13)	38.3 (5)	40.3 (5)	42.3 (12)
Hemoglobin, g/dL	14.5 (13)	12.7 (5)	13.6 (5)	14.4 (13)
Total testosterone, ng/dL	391.7 (32)	256.3 (19)*	233.6 (21)*	199.3 (24)*
Estradiol, pg/dL	21.6 (14)	40.9 (18)	49.9 (14)	96.4 (19)*
Total cholesterol, mg/dL	147.8 (26)	158.0 (13)	138.2 (9)	142.8 (23)
LDL, mg/dL	82.6 (27)	95.9 (13)	73.0 (9)	77.4 (22)
HDL, mg/dL	48.2 (27)	47.4 (13)	51.2 (9)	49.3 (22)
TG, mg/dL	93.5 (27)	77.9 (13)	74.7 (9)	83.6 (22)
TG:HDL ratio	2.1 (27)	1.7 (13)	1.0 (9)	1.9 (22)
SUN, mg/dL	14.6 (11)	14.9 (8)	15.0 (7)	11.5 (6)
Creatinine, mg/dL	0.7 (11)	0.6 (8)	0.7 (7)	0.7 (6)
Prolactin, ng/mL	11.9 (18)	10.9 (9)	17.5 (16)	20.7 (18)
AST, U/L	20.1 (36)	24.9 (10)	19.6 (14)	17.5 (24)
ALT, U/L	25.4 (34)	23.5 (10)	15.2 (14)*	17.3 (24)*

n, number of subjects with values for that particular variable of interest that were available for analysis at that time period. For subjects with >1 value available beyond 6 months, the mean of those values was reflected in this table. ALT, alanine aminotransferase; AST, aspartate aminotransferase; DBP, diastolic blood pressure; SBP, systolic blood pressure; SUN, serum urea nitrogen.

* Statistically significant change ($P < .05$).

urea nitrogen.
* Statistically significant change ($P < .05$).


ADULTO

Long-Term Follow-Up of Transsexual Persons Undergoing Sex Reassignment Surgery: Cohort Study in Sweden

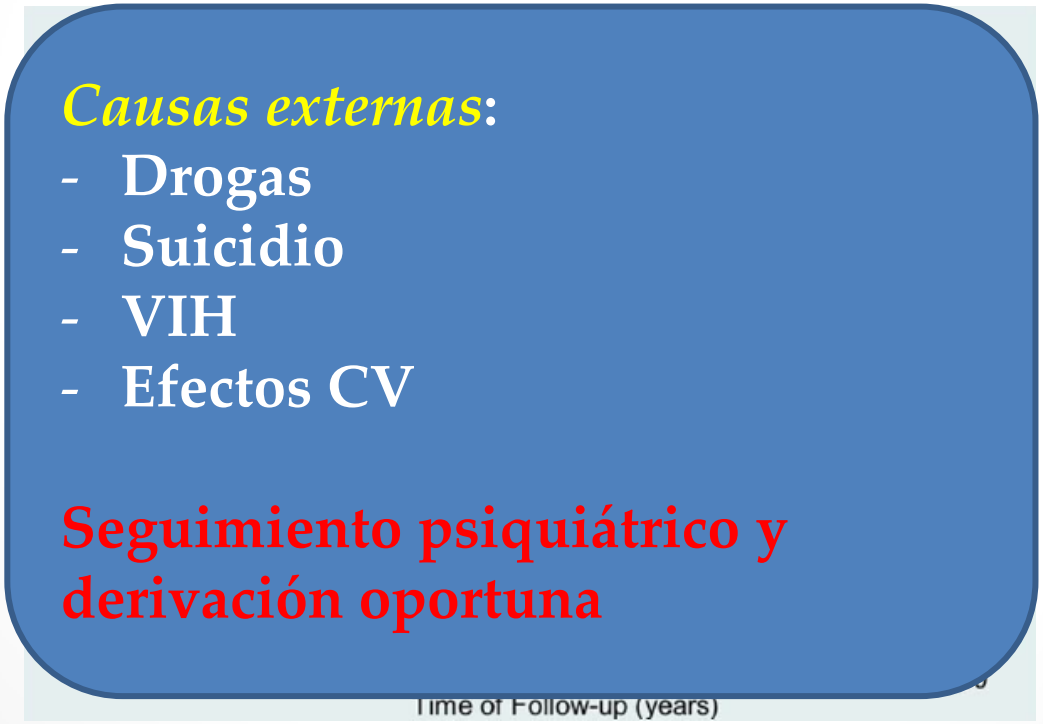
PLoS One. 2011.

Cecilia Dhejne[1], Paul Lichtenstein[2], Marcus Boman[2], Anna L. V. Johansson[2], Niklas Långström[2,3], Mikael Landén[1,2,4]*

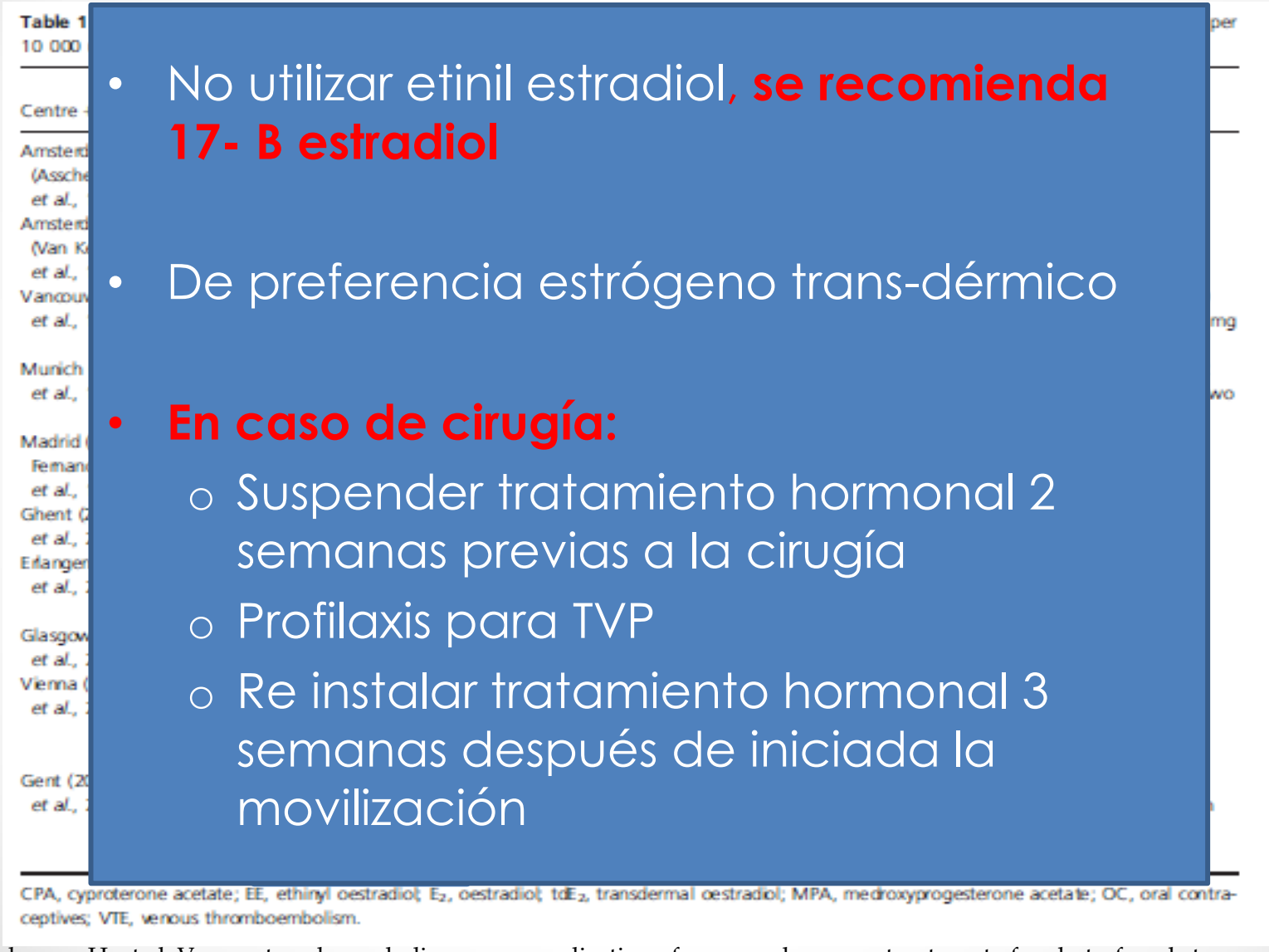
- Estudio cohorte (1973-2003) : 324 DG (191 MTF / 133 FTM).
- Población control del mismo sexo y edad.

***Causas externas*:**
- **Drogas**
- **Suicidio**
- **VIH**
- **Efectos CV**

Seguimiento psiquiátrico y derivación oportuna



Riesgo de Trombosis: Hombres a Mujeres



- No utilizar etinil estradiol, **se recomienda 17- B estradiol**
- De preferencia estrógeno trans-dérmico
- **En caso de cirugía:**
  - Suspender tratamiento hormonal 2 semanas previas a la cirugía
  - Profilaxis para TVP
  - Re instalar tratamiento hormonal 3 semanas después de iniciada la movilización

CPA, cyproterone acetate; EE, ethinyl oestradiol; E_2, oestradiol; tdE_2, transdermal oestradiol; MPA, medroxyprogesterone acetate; OC, oral contraceptives; VTE, venous thromboembolism.

Assheman H, et al. Venous trombo-embolism as a complication of cross-sexhormone treatment of male-to-female transsexual subjets: a review. Andrologia. 2014.

Riesgo Cardiovascular

- Riesgo actual → No esta establecido
- La mortalidad es > en trans hombre-mujer.
- No utilizar etinil estradiol.
- Evaluar otros riesgos cardiovasculares previos al tratamiento hormonal, corregirlos.
- En trans mujeres-hombres: la testosterona no induce hiperinsulinismo. (a diferencia de hiperandrogenismo en mujeres)

Gorren L, et al. Cardiovascular disease in transsexual persons treated with cross-sex homones: reversal of the traditional sex difference in cardiovascular disease pattern. Eeurop Jour of Endocrinol. 2014.

Cáncer

- Ca de mama
  - Es raro en trans hombre a mujer: 7 casos publicados
  - En trans mujer a hombre: casos publicados
  - **Recomendación: en trans mujeres: mamografia como mujer biológica**
  - Expertos: mutación BRCA 1(+) extirpación

- Ca de próstata
  - 7 casos publicados trans hombre-mujer,
    - previos al inicio de tto y tampoco la sensibilidad a estrógenos ???
  - **Recomendación: seguimiento clínico y bioquímico como hombre biológico**

- Gooren LJ, et al. Breast cancer development in transsexual subjects receiving cross-sex hormone treatment. J Sex Med 2013.
- Mueller A, et al. Hormone-related tumors in transsexuals receiving treatment with cross-sex hormones. Eur J Endocrinol 2008.

Cáncer

Table 2. Summary of Published Cancer Case Reports in Transmen Who Underwent Hormonal or Surgical Gender Affirmation Therapy

Cancer Site	No. of Cases	Location(s)	Age, years	Gender Affirmation Status	Comments	References
Vagina	1	Germany	60	Hysterectomy and phalloplasty	HPV positive; diagnosed 18 years after SRS	35
Cervix	2	United States, Czech Republic	38–54	2/2 cases had HT, and 1 case had mastectomy.	Both cases were diagnosed less than 10 years after HT.	17, 34

- PAP: muestra inadecuada 13% vs 1, 3 %
- Mamografía
- Identificar otros factores de riesgo
- Mejorar la atención en salud

Braun. Et al. Cancer in Trnasgender people: Evidence and methodological consideración. Jhon Hopkings Bloomerberge School of Public Health. 2017

Low bone mass is prevalent in male-to-female transsexual persons before the start of cr

E. Van Caenegen
I. Haraldsen [c], G.
Schreiner [b],

Table 3
Descriptives of bone parameters as measured by DXA at the lumbar spine and left hip of transsexual women before start of cross-gender hormonal treatment.

	Transsexual women (n = 25)	Matched Control males (n = 25)	Male reference population (n = 941)
Lumbar spine			
Bone area (cm^2)	69.2 ± 7.0	70.7 ± 6.4	71.4 ± 6.8*
BMC (g)	67.4 ± 12.4	74.2 ± 10.1	75.8 ± 13.1***
aBMD (g/cm^2)	0.97 ± 0.13	1.05 ± 0.10	1.06 ± 0.13*
Femoral neck			
Bone Area (cm^2)	5.8 ± 0.5	5.7 ± 0.3	5.9 ± 0.4
BMC (g)	4.5 ± 0.8	5.2 ± 0.6**	5.2 ± 0.8**
aBMD (g/cm^2)	0.78 ± 0.12	0.92 ± 0.13***	0.88 ± 0.13**
Total hip			
Bone area (cm^2)	44.0 ± 3.8	45.2 ± 3.4	45.3 ± 4.4
BMC (g)	41.5 ± 7.9	50.1 ± 6.7***	48.6 ± 8.1***
aBMD (g/cm^2)	0.94 ± 0.14	1.11 ± 0.14***	1.07 ± 0.13***
Whole body			
Bone Area (cm^2)	2301.8 ± 160.9	2347.9 ± 129.2	2354.1 ± 155.1
BMC (g)	2526.9 ± 326.0	2900.4 ± 313.0***	2874.0 ± 371.5***
aBMD (g/cm^2)	1.09 ± 0.07	1.23 ± 0.09***	1.22 ± 0.10***

Descriptives are expressed as mean ± SD. All variables were corrected for weight and height.
*** $p \leq 0.001$.
** $0.001 < p \leq 0.01$.
* $0.01 < p \leq 0.05$.

Table 1
Descriptives
transsexual

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*** $p \leq 0.00$
** $0.001 < p$
* $0.01 < p$

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DMO

Trans mujeres

- Se mantiene después de varios años de tto hormonal.
- ↑ después de 2 años de tto.
- ↓ comparar con controles.
- Poca adherencia al tto hormonal post cirugía

Trans hombres

- Andrógenos:
  - ↑ cortical
  - Preserva trabecular
- Aromatización a estrógenos
- Otros factores
- DMO pero no significativa

Haraldsen IR, et al. S. Cross-sex pattern of bone mineral density in early onset gender identity disorder. Horm Behav 2007.
Lapauw B, et al. Body composition, volumetric and areal bone parameters in male-to-female transsexual persons. Bone 2008.
Reutrakul S, et al. The effects of oestrogen exposure on bone mass in male to female transsexuals. Clin Endocrinol (Oxf) 1998.

Conclusiones

1. La disforia de género es una condición poco frecuente, pero con una incidencia de consultas en ascenso.

2. La disforia de género se asocia a una **mayor mortalidad.**
   - Por **suicidio, conductas de riesgo (consumo de drogas) y ETS**
     - Evaluación y seguimiento psiquiátrico
     - Prevención y detección de conductas de riesgo y abuso de sustancias.

3. Manejo es con equipo multidisciplinario.

4. Educación: **personal de salud y población→ despatologización**

5. Participación del personal de salud y personas con disforia de genero en al generación de políticas de salud y leyes.


GRACIAS