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Male, Female, Other: Transgender and the Impact in Primary Care

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Abstract
Transgender includes patients at various stages of their journey. It is important that providers care for transgender patients with a culturally sensitive approach, awareness, and competent skill. There are new terms to learn. There may be mental health issues or substance use issues. Hormone therapy can have an impact on a person's health. As a primary care provider, it is important to be alert to these potential issues, addressing the patient's individual needs. In this study we discuss the transgender patient and outline basic care and issues that can arise in a primary care setting.

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Abstract

Transgender includes patients at various stages of their journey. It is important that providers care for transgender patients with a culturally sensitive approach, awareness, and competent skill. There are new terms to learn. There may be mental health issues and/or substance use issues. Hormone therapy can have an impact on a person's health. As a primary care provider, it is important to be alert to these potential issues, addressing the patient's individual needs. This paper discusses the transgender patient, outlining basic care and issues that can arise in a primary care setting.

Keywords: transgender; hormone therapy; primary care

Background

Incidence

Transgender individuals come from a variety of backgrounds, races, religions, ethnic groups, and socioeconomic statuses, with many having fully productive lives. The incidence of transgender persons is difficult to estimate due to lack of uniform data collection, with a wide range of estimates for both transfemale/male-to-female (MTF) and transmale/female-to-male (FTM) (Roberts and Fantz, 2014). The incidence is most likely to be much higher as data does not capture individuals who do not have a primary provider or may be obtaining their treatments from unauthorized individuals. With the passing of the Affordable Care Act came provisions for stronger data collection so it is hoped that more accurate data will be available in the near future.

Disparities

Transgender individuals face health disparities related to social stigma, discrimination, and denial of human rights. This results in higher rates of HIV/STDs, victimization, substance abuse, and psychiatric disorders (U.S. Department of Health and Human Services, 2015). Transgender youth are more likely to be homeless and two to three times more likely to attempt suicide (U.S. Dept. of Health and Human Services, 2015). Elderly transgender individuals have additional barriers to healthcare due to isolation and lack of trained social services and providers. Transgender people are also less likely to have health insurance (U.S. Dept. of Health and Human Services, 2015).

Barriers to healthcare for the transgender person tend to center around four main issues: the reluctance to disclose one's identity, the lack of experienced providers and resources, financial barriers, and structural barriers (Roberts and Fantz, 2014). Disclosure can range from the difficulty communicating with the primary provider as well as others in the community, such as pharmacist or laboratory technician (Redfern and Sinclair, 2014). Structural barriers include lack of unisex restrooms, inpatient room assignment based on gender, accurate documentation in electronic record and billing/coding systems, and appropriate reference ranges in laboratory systems. Financial barriers include lack of insurance coverage for gender specific laboratory testing, medications, and reassignment surgery. Some people have benefit limits of mental health visits per year. Medical and nursing programs lack education related to the care of the transgender patient, making the availability of quality, culturally competent care sparse. One of the goals of Healthy People 2020 (2010) is to improve the health, safety, and wellbeing of transgender individuals by providing culturally competent health care and improving education of transgender patients in medical schools. (U.S. Department of Health and Human Services,

2015). This should include education and awareness by all health care providers, increasing the number of providers capable of delivering competent care, and thus improving access to care. Resources for the provider are included in table 1.

Considerations in Primary Care

Transgender defined

Gender dysphoria is recognized by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a mental health condition. (American Psychiatric Association, 2013). There is new terminology specific to the transgender population (Gay Alliance, 2013; Alegria, 2011). Gender is often mistakenly referred to when identifying whether someone was born a female or a male, a very distinct binary concept. What many people believe as gender is actually sex, which is the biological assignment at birth, the physical attributes of a person. It is important for the practitioner to not interchange these terms as they hold different meaning to different individuals. Characteristics of Gender dysphoria, along with other terminology are described in table 2.

Cultural Competency

As a provider, awareness of a person's gender identity and biological sex is essential in order to provide competent care and recommend appropriate care and measures for conditions specific to this population (Holmes and Freeman, 2012). It is important for the provider to address the patient with their preferred name and not document in their record with their preferred name in quotation marks. The provider needs to understand the patient and desired goals in order to provide patient-centered quality care and improved outcomes. Key elements of culturally competent care include the following: being respectful--if you are not sure how

someone identifies, then it is proper to ask in a respectful way and in a private place; do not assume that sex reassignment surgery is the goal for all transgender people; remember that gender identity does not define sexual orientation; maintain privacy of all patients; and use preferred name when referring to the past (Gay Alliance, n.d.).

Role of the NP

Nurse practitioners are essential components to the care of the transgender patient. Roles include care coordination, creation of the shared care plan, and provision of primary care as well as specialty care, depending upon the training and level of expertise of the practitioner. There is a process, preferably called a "transition" that transgender individuals become involved with in regards to their sexual identity. It is a very individualized process that is dictated by that person's choices. It may include hormone replacement therapy, counseling, and surgery. This process is to facilitate congruency between the person's internal and external expression. Hormonal therapy aids in the physical expression of the desired gender. The counseling addresses the mental health issues. The individual learns to cope with the stress that they encounter, both internally and externally, in regards to their chosen gender identity. Surgery addresses the permanent physical change that some individuals seek in order to live more congruently with their chosen gender identity. Transmale patients may elect to undergo breast reduction or bilateral mastectomy, often referred to as "top surgery". They may also elect for a hysterectomy, salpingo-oophorectomy, and phalloplasty. Transfemale patients may elect to undergo breast augmentation surgery using implants or lipofilling. They may also elect to have an orchiectomy and vaginoplasty (Coleman, et al, 2012).

Hormonal therapy

Hormone therapy can help to promote the outward or external appearance to be more in line with what that individual feels. It can take an average three to six months to see any physical effects from the hormones with maximum effects taking up to five years (Coleman, et al., 2012). Patients must meet the criteria for hormone therapy prior to initiation. This includes the diagnosis of persistent gender dysphoria, the capacity to make informed decisions and consent to treatment, and if significant medical or mental health concerns are present, they must be well-controlled (Coleman, et al., 2012).

The purpose of hormonal treatment for FTM is to reduce female secondary sex characteristics, including menses, and induce male secondary sex characteristics. It is important to discuss with the patient that complete elimination of the natal sex characteristics is rare (Steinle, 2011). Hormonal treatment for MTF is to reduce male secondary sex characteristics and induce female secondary sex characteristics. This is done using the lowest effective dose that will optimize desired effect and provide the lowest risk of side effects. Hormone therapy including desired effects, risks or potential risks, and dosing is noted in table 3.

Hormone levels should be checked monthly until an appropriate dose is established. After this, monitoring is required every three to four months for the first year, completing a directed history and physical, ALT, fasting glucose and lipid panel, CBC, and trough hormone levels. After one year, if stable, monitoring can move to every six to twelve months (Steinle, 2011). Target for hormone therapy for FTM is to increase testosterone levels to that of a normal male (300-1000 ng/dl). Target for hormone therapy for MTF is to decrease testosterone levels to that of a normal female (30-100 ng/dl) without supra-physiological levels of estradiol (<200 pg/ml) by administering estrogen and an antiandrogen, such as spironolactone (Gardner & Safer, 2013).

Screening is needed prior to the initiation of hormone treatment and this can be accomplished by a primary care provider who is knowledgeable about protocols (Steinle, 2011). First, a complete history and physical, including gynecological and psychological evaluations, needs to be completed. Family history, particularly pertaining to reproductive cancers, early atherosclerosis, hypertension, hyperlipidemia, and diabetes, needs to be ascertained. For women who chose to have top surgery (double mastectomy), it is important to do a chest wall exam and axillary lymph node exam if any breast tissue remain (Steinle, 2011). Lab tests that would be prudent include fasting lipid panel, fasting glucose or HgBA1c, pregnancy test if sexually active with natal man, liver and kidney functions, hormone levels (female—estradiol, testosterone, prolactin, luteinizing hormone), Pap smear/HPV, STD screening, and sleep apnea evaluation.

Contraindications to testosterone treatment includes pregnancy, unstable coronary artery disease, androgen-sensitive breast cancer, or active endometrial cancer. Possible contraindications include cardiovascular disease, hyperlipidemia with cardiac complications, cerebrovascular disease, thromboembolic disease, history of deep vein thrombosis, polycythemia, severe obstructive sleep apnea, and active substance abuse (Steinle, 2011). Contraindications to estrogen treatment include previous thrombotic events related to an underlying hypercoagulable condition, history of estrogen-sensitive neoplasm, and end-stage chronic liver disease (Coleman et al, 2012). Risks involved with hormone therapy are described in table 3.

Responsibilities of hormone prescribing providers includes performing the initial evaluation as noted previously, discussing with the patient the risks and benefits of the hormone therapy including reproductive options, confirming the patient has the capacity to make informed decisions, provide ongoing monitoring, communicate regularly with the patient's health care

team as applicable, and if needed provide the patient with a written statement indicating that they are currently under medical supervision and treatment that includes hormone therapy, should the patient need this for legal authorities (Coleman, et al., 2012).

Special considerations

There are special considerations that need to be made due to medication choice, delivery mode, and patient history. It is important to monitor patients every three months for the first year of hormone therapy once the dose is stabilized, then again every six to twelve months. These recommendations are summarized in table 4 to facilitate use in practice.

Cardiovascular. Blood pressure needs to be monitored as both estrogen and testosterone may increase blood pressure, especially in the presence of risk factors. Hormone therapy can also have an effect on the lipid panel (Coleman, et al, 2012).

FTM

Testosterone may decrease the HDL and can have variable effects on the LDL and triglycerides (Holmes and Freeman, 2012). Administration by intramuscular injection may worsen this, so transdermal would be preferred. Patients with underlying risk factors such as PCOS and dyslipidemia are more likely to experience this. Testosterone can cause significant weight gain (more than 10%), particularly in the abdomen (Holmes and Freeman, 2012).

MTF

Estrogen can increase triglycerides, cardiovascular events, and the risk of pancreatitis. Different modes of administration will impact this risk, with transdermal decreasing the risk, thus a better choice for those with a pre-existing lipid disorder (Coleman et al, 2012). Estrogen

can also increase the risk of cardiovascular events in patient over the age of 50 with underlying risk factors. Additional progestin use can increase this risk further (Coleman et al, 2012).

Hematopoesis and Liver. Both estrogen and testosterone can cause transient elevation in liver enzymes (Holmes and Freeman, 2012) but rarely hepatotoxicity (Coleman et al., 2012).

FTM

Testosterone therapy can cause erythrocytosis (hematocrit > 50%), though this is dose dependent with a higher risk occurring with injections (44%) and less with transdermal preparation (3-18%) (Coleman, et al., 2012). If FTM and taking spironolactone, it is important to monitor the potassium level to prevent hyperkalemia (Garner and Safer, 2013).

MTF

Monitoring for venous thromboembolism (VTE) should be done as the risk is increased in patients over the age of 40, smokers, sedentary and/or obese individuals, those with any underlying predisposition, and those using additional third generation progestins (Coleman et al., 2012). This risk is decreased if using the transdermal preparation of estradiol, thus transdermal is recommended for patients that are a higher risk of VTE. Estrogen increases the risk of cholelithiasis and subsequent cholecystectomy (Coleman et al., 2012).

Endocrine. It is important to monitor for diabetes in the setting of hormone therapy as both estrogen and testosterone can produce an increased risk for diabetes.

MTF

Estrogen increases the risk of hyperprolactinemia in the first year of treatment and high dose estrogen may promote clinical appearance of preexisting but clinically unapparent prolactinoma (Coleman et al., 2012). It is important to monitor the prolactin level regularly.

Cancer.

MTF

An annual mammogram should be done in any patients age 50 or older who have undergone at least 5 years of hormone treatment. It should also be completed on anyone with a body mass index over 35, or one with known risk factors such as Klinefelter syndrome (Coleman et all., 2012), and anyone with a positive family history (Phillips et al., 2014). Prostate cancer screening should be conducted according to the guidelines if the prostate remains. (Coleman et al., 2012).

FTM

An annual mammogram should be completed if they have had a reduction mammoplasty, over 40 years of age at the time of surgery, or not had any top surgery (Coleman et al., 2012). They should have a yearly chest wall/axillary exam if they had a bilateral mastectomy (Phillips et al., 2014). Cervical cancer should be conducted according to guidelines if the cervix remains (Coleman et al., 2012).

Psychological. Screening for mental health issues should occur with both MTF and FTM patients. Screening should include depression, suicide, Post Traumatic Stress Disorder (PTSD), and Eating disorders, anxiety (Coleman et al., 2012). Substance abuse screening should be completed, though the potential for abuse is less likely in patients undergoing hormone therapy

as they are addressing the disconnect and not needing to self-medicate (Holmes and Freeman, 2012).

FTM

Testosterone treatment may increase the risk of hypomania, mania, or psychotic symptoms in people who have a predisposition. This is a dose related response that typically occurs with supraphysiologic blood levels (Coleman et al., 2012).

Musculoskeletal. Screening for osteoporosis should be done in both FTM and MTF patients. A bone mineral density or DEXA scan should be done prior to the initiation of testosterone therapy if the person is at risk for osteoporosis. Otherwise it is recommended to start DEXA scans at age 60 or earlier if hormone levels are consistently low (Gardner and Safer, 2013).

FTM

Testosterone maintains or increases the bone mineral density prior to an oophorectomy and in the first three years of treatment. There will be an increased risk of bone mineral density loss after an oophorectomy if the testosterone treatment is interrupted or insufficient (Coleman et al., 2012).

Skin, Hair, Nails.

FTM

Testosterone can contribute to acne and androgenic alopecia (Coleman et al., 2012). It is important to educate the patient regarding good skin care.

Sexual. There is an increased risk of sexually transmitted diseases in the presence of high risk behaviors as with any individual (Redfern & Sinclair, 2014). Fertility is impaired with hormone therapy. Changes will occur in libido, with estrogen decreasing libido and testosterone increasing libido. Estrogen will decrease nocturnal erections, with a variable impact on sexually stimulated erections (Coleman et al., 2012).

Lab Interpretation. Interpreting values that have different reference ranges for males and females can prove complicating for providers. Some tests have gender specific reference ranges. Liver enzymes, lipid profiles, and cardiac markers are reported based on the indicated sex of the patient. It is not clear when the patient is transgender (Roberts & Fantz, 2014). The NP may consult with a transgender specialist to determine which range to follow and when in that patient's treatment course it should change.

Summary

There are many aspects of healthcare related to the transgender patient. There is a need for culturally sensitive and competent care. Unfortunately, there is a lack of education regarding care for the transgender patient in nursing and medical schools as well as a lack of resources available for the practicing provider, leaving the transgender person with great disparity regarding accessing quality care. There is new terminology and understanding of the transition process, including hormone therapy and surgery. The practitioner must understand where resources can be located as well as develop competence in ensuring thorough health care maintenance issues for patients undergoing hormone therapy. By gaining this knowledge, the NP can improve access to quality healthcare, improving outcomes through the provision of competent, compassionate, culturally sensitive care. The NP is well trained to provide advocacy,

care coordination, and provision of healthcare. This will result in individualized quality patient centered care, which should lead to an optimum state of health.

References

Alegria, C. (2011). Transgender identity and health care: implications for psychosocial and physical evaluation. *Journal of the American Academy of Nurse Practitioners, 23,* 175-182. DOI:10.1111/j.1745-7599.2010.00595.x

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Coleman, E., Bockting, W., Botzer, M., Cohen-Kettenis, P., DeCuypere, G., Feldman, J., . . . Zucker, K. (2012) Standards of Care for the Health of Transsexual, Transgender, and Gender-Nonconforming People, Version 7, *International Journal of Transgenderism, 13*:4, 165-232, DOI: 10.1080/15532739.2011.700873

Gardner, I., & Safer, J. (2013). Progress on the road to better medical care for transgender patients. *Current opinions in endocrinology, Diabetes, and Obesity, 20.* 553-558. DOI:10.1097/01.med.0000436188.95351.4d

Gay Alliance. (2013). *A glossary of terms associated with the LGBTQ communities.* www.gayalliance.org

Gay Alliance. (n.d.). *trans-basics*. www.gayalliance.org

Health People 2020. (2010). Transgender Health Factsheet. Retrieved from http://www.lgbttobacco.org/files/TransgenderHealthFact.pdf

Holmes, J., & Freeman, S. (2012). Assessment and management of female-to-male transgender patients: a psychosocial and hormonal approach. *The American Journal for Nurse Practitioners, 16:*11/12, 6-14.

Phillips, J., Fein-Zachary, V., Mehta, T., Littlehale, N., Venkateraman, S., & Slanetz, P. (2014). Breast imaging in the trangender patient. *AJR, 202.* 1149-1156. DOI:

10.2214/AJR.13.10810

Redfern, J., & Sinclair, B. (2014). Improving health care encounters and communication with transgender patients. *Redfern strategic medical communications, Inc. Goshen, NY*

Roberts T., & Fantz, C. (2014), Barriers to quality health care for the transgender population, *Clinical Biochemistry.* dx.doi.org/10.1016/j.clinbiochem.2014.02.009

Steinle, K. (2011). Hormonal Management of the female-to-male transgender patient. *Journal of Midwifery & Women's Health, 56:*3. 293-302. DOI:10.1111/j.1542-2011.2011.00037.x

U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. (2015) *Healthy People 2020*. Washington, DC. Available at http://www.healthypeople.gov/2020/topics-objectives/topic/lesbian-gay-bisexual-and-transgender-health. Accessed June 10, 2015.

Table 1: Resources regarding transgender care

A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals (SAMHSA)	http://store.samhsa.gov/product/A-Provider-s-Introduction-to-Substance-Abuse-Treatment-for-Lesbian-Gay-Bisexual-and-Transgender-Individuals/SMA12-4104
Lesbian, Gay, Bisexual, and Transgender Health	http://www.cdc.gov/lgbthealth/transgender.htm
Center of Excellence for Transgender Health	http://transhealth.ucsf.edu/trans?page=home-00-00
National LGBT Health Education Center	http://www.lgbthealtheducation.org/training/learning-modules/
Guidelines for care of Lesbian, Gay, Bisexual, and Transgender patients	http://www.lgbthealtheducation.org/training/learning-modules/
Advancing Effective Communication, Cultural Competence, and Patient- and Family-Centered Care for the Lesbian, Gay, Bisexual, and Transgender (LGBT) Community	http://www.jointcommission.org/lgbt/

Table 2: Definitions related to transgender

Gender Dysphoria	• marked incongruence between one's experienced or expressed gender and their assigned gender • must be present for at least 6 months • must be manifested by a strong desire to be the other gender or some alternative gender that differs from their assigned gender. • must also be associated with significant distress or impairment regarding social, school, or other important areas of functioning
Gender	Range of characteristics of men and women/ masculinity and femininity assigned by society.
Gender expression/Gender role	Expression of masculinity or femininity by a person based on societal, cultural, and individual expectations.
Gender identity	A person's sexual identity with male, female, neither, or both.
Genderqueer	A person who does not identify with either male or female. They may identify with both, neither, or somewhere in between.
Transgender	Umbrella term that includes anyone whose self-identity, behavior, or anatomy falls outside of societal norms and expectations
Transsexual	Person whose gender identity is not congruent with their biological sex. They may or may not pursue treatment to bring congruency to their gender identity.
Transmale	Individual who was born a female but identifies with male and MAY have used hormonal and/or surgical treatment to become a male.
Transfemale:	Individual who was born a male but identifies with female and MAY have used hormonal and/or surgical treatment to become a female.
Two Spirit	Native American term that refers to someone who identifies with both multiple genders.
Cisgender	The state of not being transgender; people who identify with the sex that they were assigned at birth

Source: (Gay Alliance, 2013, American Psychiatric Association, 2013).

Table 3: Hormone therapy--desired effects, risks, dosing

FTM • Voice deepening • Clitoral enlargement • Facial/Body hair growth • Menses cessation • Breast tissue atrophy • Body fat percentage decrease (compared to muscle mass)	**Increased Risk:** Polycythemia Weight gain Acne Androgenic alopecia (balding) Sleep apnea **Potential risk:** Hyperlipidemia Potentiated psychiatric disorders (in presence of risk factors present) CVD (in presence of risk factors) HTN (in presence of risk factors) HTN (in presence of risk factors) Type 2 DM Elevated liver enzymes	Oral	Testosterone undecanoate (only available outside US)	160-240 mg/day
		Parenteral	Testosterone enanthate or cypionate	50-200 mg/week or 100-200 mg/2 weeks
			Testosterone undecanoate (only available outside US)	1000 mg/12 weeks
		Transdermal	Testosterone 1% gel	2.5-10g/day
			Testosterone patch	2.5-7.5 mg/day
MTF • Breast tissue growth • Erectile function decrease • Testicular size decrease • Body fat percentage increase (compared to muscle mass)	**Increased Risk:** Venous thromboembolic disease Gallstones Elevated liver enzymes Weight gain Hypertriglyceridemia CVD (in presence of risk factors) **Potential risk:** HTN Hyperprolactinemia or prolactinoma Type 2 DM	Anti-androgen	Spironolactone	100-200mg/day (up to 400 mg)
			Cyproterone acetate (only available outside US)	50-100 mg/day
			GnRH agonists	3.75 mg subcutaneous monthly
		Oral Estrogen	Oral conjugated estrogens	2.5-7.5 mg/day
			Oral 17-beta estradiol	2-6 mg/day
		Parenteral	Estradiol valerate or cypionate	5-20 mg IM/2 weeks or 2-10 mg IM/week
		Transdermal	Estradiol patch	0.1-0.4 mg/2X week

Source: (Gardner & Safer, 2013, Coleman, et al., 2012)

Table 4 Monitoring recommendations

MTF			FTM		
Issue	**Effect**	**Recommendation**	**Issue**	**Effect**	**Recommendation**
BP	Increase BP	Monitor BP	**BP**	May increase BP, especially in setting of risk factors	Monitor BP
Lipids	Increase Triglycerides, increase risk pancreatitis	Use transdermal to lessen effect particularly if high risk; monitor lipid panel every 3-4 months 1st yr, then every 6-12 mos	**Lipids**	Decrease HDL, variable effects LDL, Triglycerides	IM may worsen; use transdermal to lessen effect, particularly if high risk (PCOS, dyslipidemia) monitor lipid panel every 3-4 months 1st yr, then every 6-12 mos
CV Events	Increased risk CV events in pts >50 with underlying risk factors, particularly with additional progestin	Monitor for risk factors, reduce as is feasible	**Weight gain**	>10% weight gain, mostly in abdomen	Monitor weight gain; encourage exercise
Potassium	Increased risk if taking spironolactone	Monitor potassium level every 3-4 months 1st yr, then every 6-12 mos	**Erythrocytosis (Hct >50%)**	Dose and mode dependent (44% IM, 18% transdermal)	Use Transdermal to decrease risk Monitor CBC every 3-4 months 1st yr, then every 6-12 mos
VTE	Risk increased if >40, smokers, sedentary, obese, underlying thrombophilic disorder, additional 3rd generation progestin use	Monitor for VTE; Use transdermal if high risk	**Skin, Hair, Nails**	Acne, androgenic alopecia	Patient counseling regarding skin care

Liver	Transient elevation enzymes; increases risk cholelithiasis and cholecystectomy	Monitor ALT every 3-4 mo 1st yr, then every 6-12 mos	**Liver**	Transient elevation enzymes	Monitor ALT every 3-4 mo 1st yr, then every 6-12 mos
Endo-crine	Increase risk of Type II DM	Fasting glucose every 3-4 mos 1st yr, then every 6-12 mos	**Endocrine**	Decrease insulin sensitivity	Fasting glucose every 3-4 mos 1st yr, then every 6-12 mos
Hormone levels	Increase risk of hyperprolactinemia in 1st yr tx; high dose may promote clinical appearance preexisting but clinically unapparent	Monitor Prolactin level, trough hormone levels every 3-4 mos 1st yr, then every 6-12 mos		Hormone levels	Monitor trough hormone levels monthly until optimal dose attained, then every 3-4 months 1st yr, then every 6-12 mos
Breast Cancer	mammography	Annual: >50 with > 5 yrs tx; BMI >35; + family hx; known risk factors (Klinefelter syndrome)	**Breast cancer**	Mammography	Annual: reduction mammoplasty or no surgery, preop ≥ 40 age Yearly chest wall exam if bilat mastectomy
Prostate Cancer	Prostate exam	According to natal guidelines if prostate remains	**Cervical Cancer**	Pap smear	According to natal guidelines if cervix remains
Psych	Screening for depression, suicide, PTSD, eating disorders, anxiety, substance abuse	All patients each appointment	**Psych**	Screening for depression, suicide, PTSD, eating disorders, anxiety, substance abuse May increase risk hypomanic, manic, or	All patients each appointment

				psychotic sx if predisposition, though dose dependent or if supra-physiological hormone levels	
Osteo-porosis	DEXA Scan	Prior to initiation tx if risk factors; Age 60 or earlier if hormone levels consistently low	**Osteo-porosis**	DEXA Scan	Prior to initiation tx if risk factors; Age 60 or earlier if hormone levels consistently low If oophorectomy, increased risk if tx interrupted or insufficient
STD	Increased risk due to high risk behaviors	Screen for STD as warranted	**STD**	Increased risk due to high risk behaviors	Screen for STD as warranted
Sexual Health	Impaired fertility Decreased Libido Decrease nocturnal erections, variable effect on sexually stimulated erections	Use lowest possible dose for optimal effect	**Sexual Health**	Impaired fertility Increased Libido	Use lowest possible dose for optimal effect

Source: (Coleman et al, 2012, Holmes and Freeman, 2012, Garner and Safer, 2013, Steinle, 2011, Phillips, et.al, 2014, Redfern & Sinclair, 2014)