Transgender Aging and the Care of the Elderly Transgendered Patient

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INTRODUCTION

Some older transgendered persons transitioned at a young age, or in middle adulthood (Witten, 2003). Those who did not -- perhaps due to adverse social circumstances, family needs, or the absence of necessary medical services -- may transition later in life. Regardless of the timing of transition, unquestionably, the population of older transgendered persons is growing (Witten, 2004). As a result, the current practices of many health care providers may currently, and will eventually include elderly transgendered patients.

This chapter discusses the experiences of elderly transgendered persons from a gerontologic/geriatric and primary care medical perspective. In part, it relies on extrapolations made from the medical and social science literatures regarding non-transgendered elders and from general information regarding the human life cycle experience. It also relies on field studies, of the authors, with elder trans-persons. Such reliance is necessary because aging and successful aging have not been well studied among transgendered persons (Witten, 2002, 2003, 2004).
SUCCESSFUL AGING AND ITS PREDICTORS: THE GERONTOLOGIC CONCEPT OF “AGING WELL”

As a greater proportion of the world's population is reaching older ages, it has become important to consider the meaning of aging well or aging successfully (Rowe & Kahn, 1997, 1998). In recent years, words and phrases like gero-transcendence (Wadensten & Carlsson, 2003; Tornstam, 2005), productive aging (Butler, 2002; Biggs, 2005), life satisfaction, robust aging (Garfein & Herzog, 1995; Menck, 2003), and creative aging (Holstein & Minkler, 2003) have become prominent in the gerontologic and geriatric literatures (Fisher & Specht, 1999).

According to the MacArthur Successful Aging Project (Rowe & Kahn, 1995), three factors have a major influence on productive activity in older adults: health and functional capacity, social support networks, and personal characteristics. Although considerable cross-cultural variation exists, physical health, mental effectiveness, material security, social resources and relationships, and meaningful daily activity were seen as contributing to a “good old age” in most studied groups (Maylahn et al., 2005). Good physical health and functional status have been consistently associated with aging well (Fry et al., 1997; von Faber et al., 2001; Tate, Lah, & Cuddy, 2003).

One of the central domains of “positive” aging is cognitive functioning. In particular, successful aging is related to the “ability to maintain the daily activities associated with overall health” (Hawkins, 2005). Indicators of success in this area include self-esteem, perceived control, resilience, and mental well-being.
Mild cognitive impairment (MCI) is considered a transition state along a continuum between normal cognitive aging and clinical dementia. Individuals identified with MCI have been shown to have an annual conversion rate to dementia of 12-15%, significantly higher than the population conversion rate of 1-2% (Petersen, Smith, & Waring, 1999).

As discussed below, currently, there is a lack of supportive care resources for transgendered persons (Witten and Eyler, 1999). Therefore, loss of cognitive abilities may be particularly devastating to transgendered elders. (Physicians should remain alert for signs of cognitive decline and emotional depression, situations which could challenge “aging well” among their elderly transgendered patients.)

Another challenge to “aging well” for transgendered elders is that they may be at higher risk for economic insecurity than their non-transgendered peers, due to mid-life events such as the loss of employment during gender transition, workplace discrimination, and the general absence of legal protection against discrimination.

Case History - James Retires from the Workforce and Becomes Susan

James was born in a Midwestern city. He was aware of his gender difference from an early age, but did not tell anyone. James attempted to maintain a masculine façade by pursuing traditionally masculine lifestyle choices. He worked as a skilled tradesman, got married, and sometimes engaged in heavy drinking.
When James was 57 years old, his wife died. At age 61, he decided to initiate an identity change. He began estrogen therapy, legally changed his name to “Susan,” and modified his legal documents accordingly. In addition to medical care for gender transition, she required treatment for hypertension and chronic lung disease.

Susan moved into a retirement community in a new city, easily making new female friends. She did not disclose her previous gender identity to her new companions.

After living full-time as a female for two years, Susan became interested in the possibility of having a sexual relationship as a female. At age 63, she underwent genital reconstruction surgery. Soon thereafter, Susan met an older bisexual woman at church with whom she had a sexual relationship thought this ultimately did not last. She also “came out” regarding her transgender history to her friends at church, who were supportive.

Some time later, Susan relocated to another community. She became active in religious service work, civic volunteer work, and teaching her hobbies. She has remained single and has many friends. None of them know about her gender transition. She had decided to avoid “coming out” following her move.

Susan is a vibrant, resilient individual. Her life course has been unusual, but she is aging successfully while making choices that are true to her heart. With regard to her decision to transition, and the need to repeatedly adapt to new social
relationships in light of her gender transition, Susan stated, "It's brought me a lot of heartache, but it's opened a lot of doors."

Susan's journey demonstrates changes and concerns that sometimes accompany later-life transitions.

**TRANSGENDER AGING AND HEALTHCARE**

*General Medical Care*

The physical (morphological) realities of aging may facilitate social gender transition. For example, women and men share more physical similarity during the elder years than at any time since childhood. Loss of facial skin tone produces a softer appearance for many natal males. Additionally, the natural diminishment of circulating estrogens, accompanied by a shift towards androgenization of the hair follicles, facilitates the production of light new beard growth in natal women. Furthermore, the loss of muscle mass and increased body fat content which is experienced by both male and female elders often results in phenotypic gender convergence of the body habitus (*i.e.* women and men appear more alike than before with regard to body fat distribution, girth and posture).

Physical functioning, such as that required for the performance of the usual activities of daily living, is generally unaffected by gender transition, though androgen supplementation will result in increased muscle mass and often physical robustness.
In many ways, the health care experiences of women and men become more similar after the childbearing years. Emphasis is placed on preventive care, early detection of treatable disease, and maintenance of physical and mental functioning during the later years. Encouragement of physical activity and smoking cessation; normalization of blood pressure, serum glucose and lipids; screening for non-genital cancers, and many other aspects of routine care are essentially the same for women and men, whether or not they have previously transitioned gender.

The routine medical care of transgendered elderly persons does not differ from that of their non-transgendered peers in most respects. The evidence-based recommendations of the United States Preventive Services Task Force, or similar guidelines, should be followed in most respects. Screening for sex-specific cancers, and osteoporosis prevention, are two aspects of care that are substantially affected by the gender transition process.

**Hormonal Treatment**

The use of hormonal preparations is affected by the aging process. While much is known about pharmacologic and hormonal changes of aging (Roberts et al., 1996; McLean & LeCouteur, 2004; Timiras et al., 1995), research involving transgendered elderly persons using hormones is quite limited. Only recently has research involving large samples been conducted with regard to the morbidity and mortality rates for transsexual persons using cross-hormonal treatment (Asscherman et al., 1989; van Kesteren et al., 1998), and few of those studied were elderly individuals who had been using supplemental androgens or estrogens for extended periods of time.
Until additional research on the care of elderly transgendered persons is conducted, physicians must extrapolate from evidence-based recommendations regarding the care of non-transgendered geriatric patients. A general guideline is to consider both the usual effects of hormone supplementation for non-transgendered patients and the medical characteristics of the individual transgendered person.

For example, the risks of estrogen use among non-transsexual women increase with age, and it is very likely that transsexual women are similarly affected. Therefore, beginning estrogen supplementation for an older male-to-female patient with known coronary artery disease should be undertaken with extreme caution. Similarly, androgen supplementation has been associated with a variety of risks in elderly natal males, and should be used cautiously when the patient has pre-existing conditions such as sodium and fluid-retention sensitive renal disease or elevated serum hemoglobin. Specific considerations regarding the use of estrogens and androgens are discussed below.

*Estrogen Supplementation*

Due to the current lack of data regarding the clinical experience of older transsexual women, estrogen use in this population must be considered in light of information gained from the study of post-menopausal estrogen supplementation among non-transsexual women.

The use of supplemental estrogen by older non-transsexual women is currently a matter of clinical controversy. For decades, it was believed that the longer average life expectancy enjoyed by women, relative to men, was in large part due to hormonal
factors: higher levels of estrogen production, lower testosterone, or both. Therefore, it was argued, supplementing estrogen following the menopausal decline would continue this physiological advantage, reducing the risk of cardiovascular disease and prolonging life. In vitro evidence had demonstrated salutary effects of estrogen on physiological processes known to affect vascular functioning, such as the renin-angiotensin system, nitrous oxide synthesis and secretion, etc. Available clinical data, including the Nurses' Health Study (a prospective cohort study, including 70,533 nurses, 20-year observational data, Grodstein et al., 2001) supported this theory, at least in part.

Subsequent data from randomized, controlled trials contradicted this viewpoint. The Heart and Estrogen/Progestin Replacement Study (HERS) trial failed to demonstrate any cardiovascular benefit -- and found a probable increased risk -- among women with pre-existing coronary artery disease and taking estrogen and progestins post-menopausally (Grady et al., 2002; Roussouw et al., 2002). The Women's Health Initiative (WHI) trial studied the effects of hormone use among post-menopausal women without known cardiovascular disease. An increased risk of cardiac events was detected in the combined estrogen-progestin arm of the trial, while the estrogen-only arm found no increase in cardiac events, but an increase in cerebrovascular events (The Women's Health Initiative Steering Committee, 2004). (Some benefits of estrogen use were also detected, including reduced risk of colon cancer and osteoporosis.) Following publication of these results, estrogen supplementation was no longer recommended for either primary or secondary prevention of coronary artery disease among post-menopausal women, and women taking estrogen were encouraged to discontinue its use.
The HERS and WHI conclusions have been challenged on numerous methodologic grounds. (See Speroff & Fritz, 2005, pp. 689-777, for discussion of the data and controversies regarding post-menopausal estrogen use.)

Current concerns that pertain directly to the treatment of older transsexual women relate to age at onset of estrogen use, type, route and dosing of estrogen used, and concurrent risk factors, particularly smoking.

*Age at Onset of Use.* Although the average age of menopause in the United States is 51 years, the average age of enrollees in the WHI trial was 63.3 years. Twenty-five percent of the participants were 70 to 79 years of age. It has been suggested (Phillips & Langer, 2005; Speroff & Fritz, 2005; others) that estrogen plays a beneficial role in preventing the formation of vascular plaque, but may have deleterious effects (*e.g.*, increased likelihood of erosion and rupture) on existing plaque. Therefore, estrogen use begun at younger ages, such as at the time of menopause, when cardiovascular plaque would usually not yet be well established, might have primary preventive benefit with regard to the development of cardiovascular disease. Recent re-analysis of the Nurses' Health Study data has supported the possibility that timing of hormone replacement therapy initiation, in relation to age, influences coronary risk (Grodstein et al., 2006). Sub-analysis of the WHI data also revealed that among women aged 50 to 59, coronary events were less common in the group using estrogen than those taking a placebo (Hsia et al., 2006). Speroff and Fritz conclude:

The cardiovascular results over the last few years support an emerging theme. The theme is: *Healthy endothelium* is needed to respond to estrogen...the vasodilatory effects of
estrogen dissipate with increasing age. By the time the endothelium is involved with atherosclerosis, it is too late for estrogen to exert a beneficial effect…And there continues to be good reason (a combination of biologic data and uniform agreement in a large number of observational studies) to believe that hormone therapy can have a beneficial role in the primary prevention of coronary heart disease. (Ibid, p. 733)

Although the effects of estrogen on the cardiovascular system have not been well studied among natal males, it is probable, or at least possible, that similar findings will emerge. Transsexual women who begin hormonal gender transition at older ages will likely have the same clinical experience as their natal female peers who begin estrogen use at advanced ages.

Type, Route and Dosing of the Hormonal Preparation. Both the HERS and WHI trials utilized conjugated equine estrogens (CEE) which were administered orally. It has been suggested that transdermal administration may be associated with a lower thrombogenic risk (due to differences in hepatic metabolism), as might the use of other estrogen compounds, principally 17-beta-estradiol (E2). Relatively small studies measuring physiologic endpoints have suggested an increased thrombotic risk among women taking oral CEE but not among those using transdermal E2 (Vongpatanasin et al., 2003), and a greater reduction in measures reflecting vascular sympathetic tone among smokers using transdermal E2 relative to those using oral CEE (Girdler et al., 2004). These findings suggest that transdermal, rather than oral, estrogen preparations should be used by women taking hormonal supplementation. However, these studies utilized different estrogen compounds, as well as different routes of administration.
In a small study of hormonal treatment among transsexual women, Toorians et al. measured the effects of cyproterone acetate (CPA) alone, vs. CPA in combination with transdermal E2, oral ethinyl estradiol (EE) or oral E2, on a number of homeostatic variables associated with venous thromboembolism (Toorians et al., 2003). Although the other regimens produced only small effects on the measured variables, oral EE administration produced significant deleterious effects on activated protein C resistance, plasma protein C, and total and free plasma protein S. The authors conclude that “the prothrombotic effect of EE is due to its molecular structure rather than to a first-pass liver effect…these differences may explain why MF transsexuals treated with oral EE are exposed to a higher thrombotic risk than transsexuals treated with [transdermal] E2.”

Changes in the type of estrogen program used probably explain the observed decline in thromboembolic events and all cause mortality observed among transsexual women, over time, in the relatively large-sample Dutch data (Asscheman et al., 1989; van Kesteren et al., 1997). Although data regarding elderly transsexual women followed over long periods of time is still very scant, it is encouraging that observed mortality in the second study (van Kesteren et al., 1997) was not in excess of expected general Dutch population norms. The authors state, “In both the M-->F and F-->M transsexuals, total mortality was not higher than in the general population and, largely, the observed mortality could not be related to hormone treatment … It seems that in view of the deep psychological needs of transsexuals to undergo sex reassignment, our treatment schedule of cross-sex hormone administration is acceptably safe.”
Concurrent Health Risks. Cigarette smoking is the greatest modifiable risk factor for cardiovascular disease and thromboembolic events. Patients who use estrogens should not smoke. This is particularly important in the middle- and older adult years, as the risk of these conditions rises with age. Other risk factors for estrogen-associated morbidity and mortality, particularly among the elderly, include uncontrolled hypertension, pathologic hypercoagulable states, any history of thromboembolic disease, uncontrolled diabetes mellitus, atypical migraine syndromes, and the use of unusually complicated pharmacologic regimens.

Clearly, additional clinical research regarding the use of hormonal treatments by elderly transsexual women is needed. Current information suggests the following recommendations:

1) Treatment with estrogen during mid-life and the later years is associated with significant benefits and medical risks. Patients should be advised of the risks, benefits and possible side-effects of estrogen use, and assisted in making an informed decision.

2) Transsexual women who begin hormonal treatment in mid-life or at later ages should be evaluated for indications of cardiovascular disease, glucose intolerance, and other chronic conditions which may be worsened by the use of estrogen.

3) Estrogen preparations should be used with extreme caution, or not at all, by older transsexual women with uncontrolled concurrent health risks.
4) Elderly transsexual women wishing to begin treatment with estrogen should be advised of the potential complications of estrogen supplementation, particularly with regard to possible destabilization of occult vascular plaque.

5) Minimal, clinically adequate estrogen doses should be used. There is no evidence to support the use of high doses of either estrogens or androgens for elderly persons.

6) When possible, transdermal 17-beta-estradiol preparations should be used.

7) Transsexual women who use estrogen should not smoke. This is particularly important in the later years. Physicians should assist their older patients in smoking cessation.

Androgen Supplementation

Androgen supplementation among non-transsexual men is currently controversial (Darby 2005; Snyder, 2004; others), and data regarding testosterone use by elderly transsexual men is scant. Testosterone production in natal males declines slowly from mid-life through old age, eventually by nearly 50%. Average serum testosterone levels among 30 year-old men are about 600 ng/dl, or 20.8 nmol/l; mean values for 80 year-old men are approximately 400 ng/dl, or 13.9 nmol/l. This “andropause” results in a decrease in muscle strength and mass, bone strength (though it is primarily the androgen-derived estrogen that maintains bone density), erythrocytosis, and subjective well-being. Frailty often increases over time.
Androgen replacement has been suggested as a means of maintaining vigor and robustness among elderly men. However, because of the associated risks, androgen supplementation is not recommended for routine use by most relevant professional bodies (e.g. United States Institute of Medicine, Endocrine Society of Australia, others). Supplemental testosterone is used primarily in deficiency states accompanied by clinical evidence of resultant problems (Conway et al., 2000), particularly if the morning serum testosterone level falls below 300 ng/dL (ASA Position Statement, 2006). Some authors use 200 ng/dL as the value below which men should be considered hypogonadal, regardless of age and other factors (reviewed in Wald et al., 2006).

Elderly transsexual men require ongoing testosterone supplementation, particularly if oophorectomy has been performed. At present, little data is available regarding optimal androgen dosing, monitoring, etc., in this population. Initiation of androgen use in the elder years for the purpose of gender transition is even less common than continuation of treatment begun earlier in the life course. Clinical considerations are therefore based on experience with testosterone use by non-transsexual men.

*Risks Associated with Supplemental Testosterone Use.* Research among non-transsexual men using supplemental testosterone has identified the following side effects and health risks: acne and oily skin; breast enlargement and tenderness, especially early in treatment; fluid retention and peripheral edema; sleep apnea, worsening of prostate disease (fortunately not a consideration for transsexual men); the development of polycythemia (considered in detail below), and possibly negative effects on androgen-
sensitive epilepsy and some migrainoid conditions (reviewed in ASA Position Statement, 2006; Conway et al., 2000; Wald et al., 2006).

Some authors consider a personal history of breast (or prostate) cancer to be an absolute contraindication to use of supplemental testosterone (Conway et al., 2000). Relative contraindications include chronic obstructive pulmonary disease, particularly among patients who are overweight or who smoke tobacco (Wald et al., 2006), and renal or cardiac conditions (e.g. congestive heart failure, uncontrolled hypertension) that may be worsened by temporary fluid expansion (Conway et al., 2000). The presence of sleep apnea, migraine and epileptic syndromes should be taken into account in clinical decision making.

Though cardiac effects, in the absence of significant existing disease, have generally been neutral overall (Tan & Salazar, 2004), the long-term impact of testosterone on cardiovascular disease remains unknown (Tenover, 1999, reiterated in Wald et al., 2006). Testosterone increases thrombogenicity and platelet aggregation, though the AACE Hypogonadism Task Force has noted that resultant clinical problems have not been found among natal males receiving replacement doses of testosterone (AACE, 2002). Whether this is equally true among transsexual men is unknown. Supratherapeutic androgen administration, such as is sometimes used by male bodybuilders, is associated with cardiac disease and other serious complications, and is thoroughly contraindicated for both transsexual men and natal males.

*Polycythemia.* Testosterone supplementation results in increased erythrocyte production in both natal females and natal males. Although this may provide therapeutic
benefit to elderly persons suffering from decreased erythropoiesis, occasionally hemoglobin and hematocrit elevate to pathologic levels, particularly if the serum testosterone is above the usual male range. Arterial and venous thromboembolic events may ensue, particularly if other cardiac risk factors (especially smoking) are present (Hachulia et al., 2000). Elderly patients are at higher risk due to the vascular changes that accompany the aging process. Wald et al. (2005) note, “The main risk factor for polycythemia with testosterone administration appears to be age, and the incidence of this risk factor was reported to be higher with intramuscular rather than transdermal preparations.” (Wald et al., 2006, p. 129)

Older female-to-male patients should be advised about the possible consequences of polycythemia, and should have hemoglobin and hematocrit monitored periodically. Annual evaluation may suffice when the testosterone dosage and hematocrit have stabilized over time; more frequent monitoring should be obtained earlier in the treatment process. The American Society of Andrology (ASA) recommends physical examination and hematocrit determination prior to initiation of treatment and at three, six and 12 months, and annually thereafter (ASA Position Statement, 2006). Hematocrit monitoring every six months for at least the first 18 months has also been recommended (Wald et al., 2006). Reduction in testosterone dosage, or a moratorium on supplementation, is usually required when hemoglobin and hematocrit elevate to, or above, the upper limit of the normal male range (hematocrit 52% by ASA guidelines, Ibid, p. 133).

Female-to-male transsexual patients who develop polycythemia should be treated in the same way as non-transsexual men who develop this condition while using
androgen supplementation for treatment of hypogonadism. When hematocrit elevates above 54%, phlebotomy should be undertaken to reduce it below 45%, in order to prevent vascular occlusive complications (Pearson & Messinezy, 2001). Actual polycythemia vera may be insufficiently responsive to phlebotomy alone and may require treatment with chemotherapy.

*Choice of Testosterone Preparation.* Testosterone can be administered by a variety of routes, including transdermally, intramuscularly, orally and buccally.

Hepatic dysfunction and malignancies have previously been observed among men using oral testosterone preparations (Nieschlag & Behre, 1998, in Wald et al., 2006) though a newer preparation of testosterone undecanoate dissolved in castor oil appears to be acceptably safe (Gooren & Bunck, 2004) and is currently used in Canada and parts of Europe.

Although intramuscular testosterone preparations have long been the mainstay of female-to-male hormonal treatment, other routes of administration, particularly the transdermal patches and gels, offer some advantages in the treatment of elderly patients. Elderly persons generally exhibit less muscle mass than younger persons, and may experience more difficulties with injection pain and other sequelae. Transdermal administration also provides less variability in average testosterone levels than most injection programs. Among natal males, transdermal patches, applied nightly, produce a mean total testosterone profile that mimics the male circadian pattern (Mazer et al., 2005). Some patients cannot tolerate the dermal irritation that the patch can produce; this may be a greater problem among older patients because of age-associated dermal
changes. Topical testosterone gel does not produce the circadian pattern associated with patch use (Mazer et al., 2005) but is easy to use and is generally well accepted by female-to-male patients (Feldman, 2005).

Buccal testosterone administration also appears to be safe and effective (Dobs et al., 2004), though its role in the treatment of older patients, who are more likely than younger individuals to experience problems maintaining oral health, remains to be determined.

It is clear that additional clinical research regarding use of hormonal treatments by elderly transsexual men is needed. In the meantime, current information suggests the following recommendations:

1) Treatment with androgens during mid-life and the later years is associated with significant benefits and medical risks. Patients should be advised of the risks, benefits and possible side-effects of androgen use, and assisted in making an informed decision.

2) Transsexual men who begin hormonal treatment in mid-life or at later ages should be evaluated for evidence of cardiovascular disease, chronic obstructive pulmonary disease, polycythemia and other chronic conditions which may be worsened by the use of testosterone.

3) Androgens should be used with extreme caution, or not at all, by older transsexual men with uncontrolled concurrent health risks, particularly polycythemia, conditions susceptible to worsening from fluid overload due to sodium and fluid retention (cardiac or renal disease, uncontrolled hypertension), or a history of breast cancer.
4) Elderly transsexual men wishing to begin treatment with testosterone should be advised of the fact that optimum use of androgen supplementation is not yet well understood, but that doses resulting in modest serum levels (i.e., not above the norms for natal males of similar age) should be used.

5) Hemoglobin levels should be monitored periodically (at least annually when therapy is well established) among both transsexual and non-transsexual men who use supplemental androgens. (See Darby, 2005, re: treatment of non-transsexual male hypogonadism.)

6) When possible, transdermal preparations (gel or patches) should be used.

7) Transsexual men who use androgens should not smoke. This is particularly important in the later years. Physicians should assist their older patients in smoking cessation.

**Surgery**

Research regarding the surgical experience of elderly transsexual patients is scant. Many outcome studies have included small numbers of elderly participants, but none has specifically evaluated the experience of this population. Older age at the time of surgery has been associated with an increased likelihood of dissatisfaction or regret following male-to-female genital surgery in several studies (Eldh, Berg & Gustafsson, 1997; Lindemalm et al., 1987; Rubin 1993; others) though not in others (Krege et al., 2001; Kuiper & Cohen-Kettenis, 1988; Landen et al., 1998; Lawrence, 2003; others). Overall, regrets have been uncommon.
However, even the larger studies with “older” enrollees have included few participants over age 65. For example, in Lawrence's work involving 232 male-to-female transsexual adults (Lawrence, 2003), the mean age at the time of surgery was 44, with standard deviation of 9 years.

Documentation of the experience of older female-to-male individuals is even more limited. Therefore, the current approach to sex reassignment surgery among elderly persons is based on extrapolation from the surgical experience of older adults undergoing other surgical procedures and from the emotional experience of younger adults.

Anecdotal information suggests that the results of genital surgery for elderly transsexual patients are often not as good as those achieved by younger persons, due to the relative lack of tissue distensibility, the age-related genital shrinkage that may have occurred prior to initiation of hormonal supplementation, and the loss of tissue tone (personal communication: Kuzon, W. and Wilson, N). Nonetheless, transsexual elders may experience the same emotional relief of gender dysphoria and sense of completion as their younger peers. For many older persons, the joy of personal fulfillment is tempered by regret that the opportunity for gender transition, including gender confirmation surgery, did not arise until so late in the life course.

Decisions regarding candidacy for the surgical procedures associated with gender transition are made on the basis of the health status of the patient, rather than on the basis of chronological age, per se. Elderly patients who are in good health may be reasonable candidates for genital surgery, though a thorough pre-operative evaluation should be performed. Medical and surgical history, current cardiovascular health status, and
complexity of the planned procedure, including estimated anesthesia time, cardiovascular stress, physiologic fluid shifting, etc., should be weighed by the patient's personal physician and anesthesiologist. (See King, 2000, regarding pre-operative evaluation of surgical risk.) Genital surgeries are usually scheduled far in advance of the surgery date, allowing ample opportunity for cardiopulmonary evaluation to be conducted on an outpatient basis during the months prior to the planned procedure.

Patients who are unable to undergo genital surgery due to lack of medical fitness may be appropriate candidates for less extensive procedures, such as breast augmentation mammoplasty and facial cosmetic surgery. For some male-to-female patients, facial surgery may provide as much benefit with regard to social integration as genital surgery (Hage et al., 1997), though specific data regarding elderly persons is lacking in this regard.

For any surgical procedure, pre-surgical risk assessment should be performed according to evidence-based guidelines, with an emphasis on the balance between the anticipated cardiovascular demand of the procedure and the physiologic reserve of the patient.

Post-surgical recovery times generally lengthen with age. Older persons undergoing surgery usually need more in-home support during the weeks following surgery than their younger peers. Assessing the degree of family support and other available resources is a crucial aspect of the surgical planning process, particularly in the United States, where hospitalizations are often relatively brief, and much post-surgical recovery and care occurs in the home setting. The recovery process may be further
complicated if empathic, non-judgmental personal care assistants are not available during the post-operative period.

**Osteoporosis**

Osteoporosis is a medical condition which is of particular concern to elderly transsexual women and transsexual men, because of the crucial role of sex steroids in maintaining bone density. It is a common and painful condition. In the United States, 16% of women and 5% of men over age 50 will experience at least one vertebral fracture; 18% of women and 6% of men will experience at least one hip fracture. Fractures are less common among men because of the greater baseline adult bone mass and the slower decline in sex steroid production with aging. However, osteoporosis among men is increasing as men live to older ages.

Osteoporosis has been reported among both transsexual women and transsexual men, though there has as yet been little systematic study of this condition in the transsexual population. Several small studies have indicated an increased risk of bone demineralization among both male-to-female patients who did not receive (or did not comply with) adequate estrogen replacement (Hierl et al., 1999; Ruetsche et al., 2005) and among female-to-male patients following oophorectomy (van Kesteren et al., 1998). Other studies (Mueller et al., 2005; Reutrakul et al., 1998; Schlatterer et al., 1998; Sosa et al., 2003; Turner et al., 2004) have found mean bone densities at or above the usual range for age and natal sex, though these have utilized relatively short follow-up intervals and have included few elderly participants. One study with longer follow-up -- mean 12.5 years for 24 male-to-female participants and 7.6 years for 15 female-to-male participants
-- found bone densities at or above expected norms, except for five cases of osteoporosis among male-to-female patients who did not comply with hormonal treatment (Ruetsche et al., 2005).

As is the case among non-transsexual middle-aged and elderly persons, hormone deprivation appears to be a primary risk factor for the development of osteoporosis among both male-to-female and female-to-male transsexual patients. Serum LH levels may provide the best predictor of adequacy of hormone replacement for osteoporosis prevention (van Kesteren et al., 1998).

Until specific guidelines for the prevention and treatment of osteoporosis among transsexual patients become available, the following recommendations can be made:

1) Physicians should remain alert for the possibility of bone mineral loss among their transsexual patients, particularly those with risk factors for the development of this condition (advanced age, smoking, treatment with anti-inflammatory steroid medications, etc.).

2) Transsexual patients, particularly those who have received oophorectomy or orchietomy, should be advised of the risk of subsequent bone demineralization, and advised to adhere to hormonal treatment over time.

3) All patients should be advised to reduce their risk of osteoporosis development through lifestyle modification, *i.e.* smoking cessation, limited alcohol use, weight-bearing exercise.
4) Calcium and vitamin D supplementation should be advised for middle-aged and older persons at risk for osteoporosis unless it is otherwise contraindicated (e.g. renal disease, recurrent nephrolithiasis).

5) If hormonal supplementation becomes unfeasible (e.g. for the elderly patient who develops a hormone-responsive malignancy), then bone mineral density should be monitored and alternate treatments (i.e. bisphosphonates, calcitonin, parathormone agonists) considered.

6) Serum LH levels may provide the best predictor of adequacy of hormone supplementation. Densitometry should be interpreted with natal sex norms, and followed over time when clinically indicated.

7) In all cases, the minimum adequate dose of estrogen or testosterone should be used, as there is no evidence to support the use of high-dose hormonal supplementation among elderly persons of either sex.

**HIV in Later Life**

The presence of HIV/AIDS in the transgendered population has been a matter of increasing concern (Nemoto et al., 2005; Pisani et al., 2005; Schwarz & Scheer, 2004; Nemoto et al., 2004). Regardless of the age of gender transition, beginning to socialize in the true psychological gender necessitates learning new “sexual negotiation skills,” and new sexual relationships can provide an opportunity for exposure to HIV and other sexually transmissible infections. Older adults may be particularly vulnerable in this regard, due to having come of age in an era during which HIV infection was not yet a
concern. Lack of familiarity with risk-reduction techniques is also more common than among younger adults, who have often received this information in school or other group venues. Many older transgendered persons report not having used any safer sex techniques during first dating experiences in the new gender presentation.

Data comparing the risk of HIV infection for transgendered and non-transgendered single, older adults is currently lacking. However, the burden which infection places on transsexual or transgendered persons may be greater, due to the competing medical demands it creates. HIV infection in later life often leads to situations in which middle-aged or elderly persons are living with the burden of obtaining both antiretroviral chemotherapy and the medical treatments associated with other chronic conditions. The need to get (and, in some countries, finance) appropriate hormonal and surgical services compounds this problem (Witten, 2004).

Physicians caring for older transgendered persons should remain alert to the possibility of HIV risk and infection. Suggested interventions include:

1) Discussion of social and sexual behaviors prior to beginning gender transition and at intervals during this process;

2) HIV risk-reduction education, tailored to the sexual practices and preferences of the individual;

3) Referral to transgender community resources for additional support of healthy sexual behaviors, if this is indicated and resources are available.
Practical Concerns in Transgender Health Care

Privacy and Gender Identity Disclosure. Health care has both medical and social aspects. Obtaining health care and personal assistance services is more complex for persons who are transgendered -- and have not had genital reconstruction surgery -- than for those who are transsexual and post-operative. Apparent mismatch between genital anatomy and gender of presentation can create difficulty in obtaining medical services (Bockting et al., 2004), practical nursing care, or even appropriate funeral arrangements (as in the case of Billy Tipton, whose female genitalia were “discovered” by the mortician and sensationalized in the American tabloid press).

Health Care and Financial Status in Old Age. Financial resources in later years usually depend on long-term economic status throughout much of adulthood (Choudhury & Leonesio, 1997) and can be negatively affected if gender discrimination resulted in job loss. Such adverse events may impact the affordability of immediate and long-term health care, housing (Liebig, 1996) and retirement (Vitt & Siegenthaler, 1996). A comprehensive discussion of the mid-life issues of aging among transgendered persons may be found in Witten (2004).

TRANSGENDER AGING AND SOCIAL ADJUSTMENT

Gender transition at any age requires physical, legal, and social adaptation. Family relationships, community integration and social support are important aspects of life for older adults, and are often significantly affected by the gender transition process.
Family relationships change with the older person's “coming out” regarding his or her gender identity. Fatherhood and motherhood, siblingships, grandparenthood and other aspects of the family constellation may be re-evaluated during the gender transition process. Children and young adults are usually, though not always, accepting of gender change (Ettner, 1999). Therefore, concerns regarding the appropriateness of disclosing authentic gender to grandchildren and other young relatives are generally unwarranted; however, young children are also vulnerable to parental prejudice, and may react negatively if their parents reject the older person.

Gender transition within the context of a long-term marriage or partnership between elderly individuals is still relatively uncommon, but experience with middle-aged couples suggests several possible outcomes. Many middle-aged spouses or long-term partners will choose to maintain the relationship as their spouse or partner changes gender presentation, genital sex, or both; many others will not.

Couples who maintain a marriage or partnership may need to redefine their relationship. More versatile persons can maintain a sexual relationship; other couples become “friends,” “sisters,” etc. In the former case, loss of the previous sexual orientation (usually as a heterosexual woman or lesbian; experience with male-transman couples is currently more limited) can be difficult for the non-transitioning partner. She may adjust by drawing a distinction between her relationship (which has changed) and her sexual orientation (which has not): “My husband is becoming a woman, but we're going to stay married.”
Some elders transition after loss of the primary relationship, as James did, though this requires reasonably good health and a high degree of self-efficacy, as many aspects of life are concurrently redefined.

Quality of life for older transgendered persons can be related to previous social integration, as well as personal flexibility and available resilience for the development of new relationships. Social network support and community resources are important for the ongoing maintenance of well-being. (Stallings et al., 1997 address these issues for the non-transgendered elderly. See also Turner, 1996; Magai & McFadden, 1996; Thompson, 1996).

The patterns of participation in religious activities among older transsexual adults are not currently known, but recent research indicates that most self-identify as belonging to a traditional religion or being highly spiritual (Witten, GSA 2004). In addition, many suffer ostracization from their original church or religious organization and must seek alternative ways in which to worship or be spiritual.

Loss of a spouse, partner, or longstanding friendship group due to death; decreased ability to maintain a private residence; loss of the ability to drive; and moving from an independent residence to an assisted-living environment (and perhaps ultimately to dependent nursing care) all tend to erode personal control. They are significant issues in the lives of all persons who survive to become the “oldest old.”

For transgendered elders, the aforedescribed challenges are compounded by issues relating to disclosure, privacy, isolation from transgendered peers, specialized health care
needs, and the potential for ostracism and negative judgment by health care professionals and caregivers. Those who previously obtained sex reassignment surgery may avoid some of these difficulties, as they generally have a well-established gender presentation, and have shed any ties to pre-transition life with the passage of time. However, those who transition in later years must decide whether to share confidential -- and potentially sensational or ostracizing -- personal information with their caregivers.

All post-operative transsexual elders must confide in their physicians and other health care professionals with regard to past medical history, or risk inadvertent exposure. For example, a transsexual woman who completed sex reassignment surgery in her youth still has a prostate. Ideally, she should receive routine prostate examinations by a health care provider who is familiar with her past medical history. Otherwise, upon admission to a hospital, her prostate may be perceived as a “rectal mass” during routine physical examination.

Physicians can assist their elderly transgendered patients by discussing the importance of routine health care, including preventive services; referring to colleagues who are empathic and supportive of transgendered persons; and educating others involved in the patients' care about the realities of human gender diversity. This latter endeavor must include medical, nursing, and social work colleagues, as well as unskilled and semi-skilled care assistants. In addition, facilitating the formation of a support group for older transsexual adults (Slusher et al., 1996) may be of benefit. Finally, addressing family dynamics, and referring for family or individual counseling when difficulties are detected, can be crucial.
Late-life and end-of-life support is important to older people. While there is no evidence that the incidence or prevalence of late-life medical problems is any different for transgendered persons than for non-transgendered persons, transgender identification can confound such problems if it sets up barriers to competent caregiving. When this happens, it increases health care disparities for this group.

The following case studies demonstrate such barriers:

Vincent, a transgendered man of 71 who had undergone chest reconstruction (but not genital) surgery 30 years ago, was experiencing early Alzheimer's dementia. He was placed within a local authority care home (a nursing home in the U.K.) where every other resident was female. Vincent had no visitors and no contact with any family. The staff stopped passing on his post, which included support group magazines, assuming he was not able to read or understand it. Vincent was extremely distressed with the paper pants and incontinence pads used in his care. Jonas called them "sanitary towels" and regarded them as women's aids. (Witten & Whittle, 2004)

Janice is an 87-year-old transsexual woman who has been living in her true gender identity for over 15 years, but who never received genital surgery. She lost contact with her only son when she transitioned. She has no remaining friends or family. Janice suffers from incontinence and terminal cancer. When she was admitted to hospice care, Janice vigorously fought with the staff over
changing her underwear, creating much stress among the hospice nurses. They did not realize her reaction was due to the fact that, despite her female identity and life, Janice’s genitalia were still male in appearance. She refuses a catheter and is wetting the bed, making caregiving difficult.

Physicians and other health care professionals must understand that elderly transgendered persons need to retain psychological wholeness while preparing for death by having their true gender respected during medical examination and personal care.

Spouses and significant others may be confronted with legal and insurance problems when carrying out the deceased person's last wishes. Physicians should encourage their transgendered patients to keep proof of their identify change, and identification-related documents, in a safe location. The patients should also be encouraged to obtain legal protection for their wishes regarding transfer of property and funeral arrangements.

CONCLUSION

As the population ages, physicians will need to be knowledgeable about the health care of elderly transgendered patients. These persons can maintain dignity, autonomy, and positive social connections while seeking integration of the physical and psychological elements of the authentic self. Health care professionals can assist in this actualizing process. Their alliances with transgendered older adults will enable the patients to successfully age and to live long and vital lives.
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CONTACTING THE PROJECT

All TranScience Research Institute research publications are available for download. All citations in this paper and past white papers are available at http://www.transcience.org. Dr. Witten is seeking participants for an ongoing confidential survey research project on gender identity and aging. If you are interested in contacting TranScience Research Institute, please send e-mail to either transcience@transcience.org or transcience@earthlink.com. More details are available at http://www.transcience.org. You may contact the project at the following address: Tarynn M. Witten, Ph.D., MSW, FGSA, Senior Fellow and Executive Director, TranScience Research Institute, PO Box 28089, Richmond, VA 23228-28089 USA.

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