

**A Survey of the Female-To-Male (FTM) Transitioning Population
Receiving Testosterone Therapy**

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Specific Aims

Transgender and transsexual populations have been historically under-served in health care systems in the United States. Although there is a growing awareness of the medical needs and culturally appropriate standards of care for this population, many health care professionals are ignorant of the spectrum of identities that exist throughout the transgender community, and practitioners often lack knowledge of the cultural, social and physical processes involved in transitioning from one gender or sex to another (Roebuck et al., 2008). This can lead to discrimination against and lack of proper medical care within transgender and gender non-conforming communities. Grassroots organizations such as the Transgender Law Center in San Francisco and community medical centers such as the Callen-Lorde Community Health Center in New York City have pioneered the pursuit of integrative care in transgender communities, and they still provide the bulk of information and comprehensive treatment planning and care for transitioning populations (Callen-Lorde, 2010).

As part of a growing effort to reach out to transgender populations from a medical standpoint, we would like to explore how acupuncture can be used in an integrative setting during the transitioning process, particularly for Female to Male (FTM) transsexuals undergoing testosterone therapy. According to research and personal discussions with people undergoing the FTM hormonal transition, high blood pressure often presents a problem during the course of testosterone therapy (Mueller, et al., 2010). Because blood pressure can be used as a quantitative measure of progress, we decided to research acupuncture's effect on high blood pressure for FTM patients actively taking intramuscular (IM) testosterone injection therapy. A first step to achieve this overarching goal is to query our target population, since there is a dearth of demographic and epidemiological information about the FTM population in the US.

We have created a survey to identify the prevalence and symptomatic trends of secondary hypertension (HTN) in the FTM transsexual population treated with testosterone therapy. This survey will provide a statistical basis for Traditional Chinese Medicine (TCM) differential diagnoses which can be used in a pilot study to determine acupuncture's effectiveness in treating HTN in the FTM population receiving intramuscular (IM) testosterone therapy.

In sum, the aim of this survey is to create the groundwork for a progression of studies:

1. Initial survey to identify general symptomologic trends within the testosterone treated FTM transsexual population. From this information we seek to predict trends of TCM pattern differentiations for HTN within the FTM population. This pilot survey will inform a second, more detailed questionnaire.

2. A detailed questionnaire and set of patient interviews in a clinical setting comprise the second pilot survey, which will further the creation of treatment strategies for testosterone injection induced HTN that can be reproduced in a clinical trial format. The subjects of the second level survey will be those who respond affirmatively to the initial email survey (hypertension). From the second level survey we aim to form a set of TCM syndromes common to hormonally treated FTM transsexual individuals along with acupuncture point prescriptions to be used in the pilot clinical trial that can be repeated across several clinical settings.

3. Pilot study of acupuncture to treat hypertension associated with FTM Testosterone Injection Therapy. Using the more detailed syndrome differentiation and point prescriptions from the second survey, we will create a pilot study to determine the effect of acupuncture on FTM patients to relieve HTN associated with receiving testosterone injections between the range of 50-150mg/week. We expect that regular acupuncture treatments can normalize blood pressure in patients using testosterone injections to hormonally transition from female to male, but this study will help focus the definition of our target population and inform the treatment time period of the study.

Background and Significance:

Female to Male Transsexual Population: Definition, Demographics and Social Significance

Testosterone therapy is essential to the health and well being of some transgender people. Testosterone therapy has been demonstrated to reduce suicide rates and enhance quality of life (Newfield E, et.al., 2006). The survey will be important to establish a foundation from which to judge prevalence of HTN among the testosterone treated FTM population. There are currently no demographics available for the FTM individuals in the United States.

Prevalence of transgender people is not known. An important aspect of this research is to bring awareness to and understanding about the transgender community to ensure access to health care. When a population is not recognized they cannot be counted and, henceforth, they cannot be cared for. Rates of transgender people are often counted by those seeking sexual reassignment, which is highly variable and based on social acceptance, legal rights, and availability of treatment (Eklund, et al., 1988). In the Netherlands research was compiled correlating the increase of transsexualism with growing liberalization of society (Eklund, et al., 1988). This is to imply that the incidence of transgender people remains constant while society's acceptance and recognition grows. Dori Midnight, a transgender health researcher, writes that many transgender peoples' experience with the health care community has been negative, "from the complicated diagnosis of gender dysphoria to the extreme medicalization of gender to humiliating and horrifying exams (Midnight, 2009)." People will not choose to engage with a health care system that does not understand or respect them.

Respect and understanding begins with being aware of our language and word choices. See **Appendix A** for a wonderful handout of ideas for allies of the transgender communities. There is great spectrum of possible gender expressions wherein hormonal therapy is only one of many aspects of gender variance and transitioning. Gender is fluid for all members of society, even for those implementing testosterone therapy. Transgender is a broad term that describes a wide variety of cross-gender behaviors and identities. The term transsexual is often a medical term not often used by people to describe themselves referring to a person who has implemented hormonal (or surgical) transitional therapy. Trans-masculine recognizes all variations of the masculine gender expression and is less binary and more inclusive than FTM. For the most part, in this paper we will be using FTM as it is commonly used in the medical literature. See **Appendix B** for a complete list of transgender terminology. The Center of Excellence for Transgender Health at the University of California, San Francisco suggests that health care providers always "ASK patients how they define themselves, and respect and USE their preferred self-definitions and pronouns appropriate to their gender identity (Transgender-related terminology, 2011)."

Merely being marginalized is a known risk-factor for poor health (Newfield E, et. al., 2006). Inclusion begins with our intake forms requiring more than a 'M' or a 'F' in the gender box. **Appendix C**

offers an example of questions needed for counting and including transgender people in our clinics. Practitioner oversight or misunderstanding should not create a tripping point which prevents access to care. It only takes a minimal level of knowledge to insure that transgender people are included.

Effects of Testosterone

Supraphysiological testosterone implementation causes major shifts in many metabolic pathways, with the major areas of influence including skin, adipose tissue (especially breast tissue), blood vessels, bone density, liver function, prostate gland function, psychological function, and secondary sex characteristics via hypothalamic-pituitary-gonadotropic (HPG) axis (Trans Resource Guide). Although a 2007 study found that oral testosterone (undecanoate) is free of liver toxicity and can produce some positive results in the treatment of testosterone deficiency syndrome, the effect of various types of testosterone supplementation on specific body tissues and metabolic processes have shown several negative effects (Hong and Ahn, 2007). Several studies have linked administration of androgen therapy and atherosclerotic cardiovascular disease (CVD), as well as arterial stiffening (Nakagawa, et al, 2003; Herbst, et al, 2003; Emi, et al, 2008; Mueller, et al, 2007).

Other common side effects of testosterone have been studied as well. Male pattern baldness and thinning of hair occur in a high percentage (up to 50%) of FTM transsexuals undergoing long-term testosterone therapy (Giltay & Toorians, 2004), and acne fulminans has been shown to trigger with the the use of high doses of testosterone (Weimann & Bohles, 1999). Adipose tissue distribution patterns change with testosterone implementation, and abdominal obesity is a common pattern although lean muscle mass generally increases (Bhasin, et al, 2007). A 1999 study found that high doses of testosterone when applied to men with normal testosterone ranges can create a significant adverse psychological effect in a minority of the study population (Yates, et al, 1999). Testosterone treatment in females has been shown to induce insulin resistance in healthy subjects (Polderman, et al, 1994), and testosterone therapy in men with hypogonadism can increase the risk of prostate cancer and breast cancer (Dobs & Morgentaler, 2008; Thomas, et al, 2008).

Mechanism of Intramuscularly Injected Testosterone

For the purpose of this study, we are surveying transgender males who are using a form of an-

drogen therapy called intramuscular (IM) testosterone. This therapy is an injection of between 50 and 300 mg of testosterone ester in an oil base, injected intramuscularly every 3 to 14 days depending on constitution of the patient. The oil base is composed of cottonseed or sesame seed oil, and it acts to slow the release of testosterone from the site of injection into the blood stream. The most common injectable testosterone esters have the highest partition coefficient and release the slowest into the blood-stream, the top two of which are testosterone enanthate and testosterone cypionate. They both take between 8-10 days to release fully into the blood stream, so they are commonly injected once every 7-14 days (Hudson FTM Guide). See **Appendix D** for commonly used injectable testosterone esters.

Once the testosterone ester enters the blood stream, esterase enzymes cleave off the ester chain in a process called “hydrolization,” which converts the testosterone ester into free testosterone. Free testosterone is then available to perform its actions in the body by binding to androgen receptor sites. Free testosterone comprises between 0.3% to 5% of total testosterone count (bound testosterone composing the remaining percentage), with 2% considered “optimal” in males. The free testosterone percentage can be used by transgender men as a measure of progress, although the way the body uses free testosterone will ultimately determine how the process of masculinization proceeds. If high doses of testosterone esters are injected repeatedly in a short period of time, the body can interpret this as excess testosterone which activates the aromatase enzyme to convert the free testosterone into estrogen. This process can create a demasculinizing effect. Therefore, finding the correct dosage and timing for each patient is of utmost importance (Hudson FTM Guide).

Testosterone Implementation in FTM Transsexuals

A 2008 review of studies of androgen treatment of FTM transsexuals revealed a clear summary of the common course of the virilizing effects and side effects of treatment. The standard treatment was administration of testosterone esters, 250 mg/2-3 weeks, parenterally (Gooren & Giltay 2008). The review’s findings are as follows:

- Virilizing effects on the skin and clitoris were prominent.
- Spatial ability improved.
- Verbal fluency deteriorated.
- Ovaries developed polycystic characteristics.
- Bone mass was preserved in females.

- Kallikreins increased, such as prostate-specific antigen, in female reproductive tissues.
- Weight, visceral fat, and hematocrit increased.
- High-density lipoprotein, cholesterol, endothelin-1, C-reactive protein, and total homocysteine increased.
- Blood pressure, insulin sensitivity, fibrinolytic markers, arterial stiffness, levels of von Willebrand factor, fibrinogen, and interleukin-6 remained largely unchanged (Gooren & Giltay 2008).

The above cited study noted that blood pressure remained largely unchanged, but we found legitimate rebuttal on this matter. A 2007 study on long-term administration of testosterone undecanoate in FTM transsexuals noted a significant increase in systolic and diastolic blood pressure, as well as an increase in triglycerides, hemoglobin, and hematocrit levels (Mueller, et al, 2007). A 2010 study on the effects of intramuscular testosterone undecanoate on FTM transsexuals noted a significant increase in systolic blood pressure, along with a significant increase in hemoglobin, hematocrit, glutamic-pyruvic transaminase [GPT], and gamma-glutamyl transferase [GGT] (Mueller, et al, 2010). Overall, the most important risk factors seem to be high blood pressure and cardiovascular disease, as well as possible damage to the liver due to increased levels of GPT and GGT, and increased risk of ovarian, uterine, and breast cancer. Mueller advises that blood pressure be monitored during treatment (Mueller, et al, 2007).

Testosterone and Hypertension: Metabolic Pathways

When administered in a supraphysiological dose, testosterone has been shown to decrease HDL levels (Herbst, et al., 2003), increase serum triglyceride levels (Elamin, et al., 2010), and most significantly increase levels of ATP and phosphocreatine in the heart (Langfort, et al, 2010). A 2010 study verified the action of testosterone to “[increase] left ventricle free fatty acid levels, [cause] an inhibitory effect on carbohydrate metabolism in the heart, and [elevate] left ventricular phosphocreatine and ATP levels” in control rats used to determine testosterone’s effect on hormone-sensitive lipase (HSL) within the left cardiac ventricle (Langfort, et al, 2010). Testosterone treatment has been shown to enhance atherosclerosis in female animals, but the mechanisms of action of this effect are not conclusive. Lowering of HDL levels is associated with higher cardiovascular risks, and supraphysiological doses of testosterone have been proven to decrease HDL in “normal young men” by 20% or more (Allan, et al, 2011).

Testosterone up-regulates SR-B1 scavenger cells, up-regulates HSL, decreases HDL, and down-regulates triglyceride breakdown, which all contribute to atherosclerotic changes in vasculature, increased blood viscosity, and precipitation of platelet aggregation. These changes all contribute to an increased risk of high blood pressure (Chronolab, 2011). Despite these observations, it bears repeating that researchers are still investigating the mechanisms of action of testosterone.

Epidemiology, Clinical Significance, and Treatment of Hypertension

Normal or optimal blood pressure is defined as the maximum level before vascular damage occurs (Rafey, 2011). The Disease Management Project at the Cleveland Clinic claims that “there is a continuous, consistent, and independent relationship between elevated blood pressure and risk of cardiovascular events (Rafey, 2011).”

HTN affects over one-third of the US population, and affects African Americans twice as much as white Americans (Cleveland Clinic, 2011). The primary risk factor for HTN is heredity. However, many factors can affect blood pressure including intake of dietary sodium, obesity, diabetes, smoking, and stress (NCBI, 2011).

HTN is known as “the silent killer” as it is asymptomatic until the disease is severe or long standing. Symptoms signal the target organ involved—cardiovascular system, brain and kidneys (Bakris, 2010). Signs of complicated HTN are dizziness, flushed face, headache, fatigue, epistaxis, and nervousness. The higher the blood pressure and more severe the signs of target organ involvement, the worse the prognosis. Coronary artery disease (CAD) is the most common cause of death among treated patients. As HTN advances, the risks for MI, stroke, and renal failure increase. Diagnosis is made by sphygmomanometry. More extensive tests include urinalysis, ECG, TSH levels, renal radionuclide imaging, and/or a chest x-ray. Normal blood pressure is classified as less than 120/80 (Bakris, 2010).

Primary HTN has no identifiable cause and accounts for 85-95% of all hypertension cases (NCBI, 2011). On the other hand, secondary hypertension is due to another medical condition or medication, such as supraphysiological testosterone (Herbst, et al, 2003).

Secondary hypertension is curable when the underlying cause is resolved. The target population of this study presents with a primary endocrine imbalance due to supraphysiologic testosterone implementation. Hypertension can often be seen in patients with endocrine disorders. However, the hypertension present with testosterone therapy is secondary hypertension in which the underlying cause is a therapeutic agent which cannot be removed.

Testosterone administration, necessary for FTM hormonal transitioning, directly effects the function of the liver (Herbst, et al, 2003) and kidneys (Nakagawa, et al., 2003) contributing to hypertension. Currently, there are no treatment recommendations specific for testosterone treated FTM individuals with hypertension.

Hypertension (HTN) from a TCM Perspective

HTN alone is asymptomatic. It is only a marker in western medicine for prevention of cardiovascular disease. Associated symptoms which can be recognised and treated by Chinese medicine are headaches, dizziness, palpitations, edema, fatigue, obesity, and improper diet. Chinese medicine also has a few specific disease patterns which may be investigated such as ‘emotional evils’, ‘wind stroke’, ‘chest Bi.’

Several Chinese medicine texts discuss the Western disease classification of HTN. None discuss the pathogenesis of exogenous testosterone. With HTN there are problems with fluid distribution. Blood being a fluid and its movement throughout the body being problematic. Since the kidney is in charge of water metabolism, kidney qi and yang deficiencies are possible patterns. When the kidney qi is deficient the kidneys lose their ability to transform water leading to accumulation of pathogenic water (Bensky & Barolet 1990). Pathogenic water is usually edema.

Testosterone is essentially supplementation of yang which may result in the body down-regulating its own production of yang. The root of all yang comes from the kidney. When Kidney yang is deficient it often transfers to other organs. The organ most susceptible is the spleen which likewise governs the transportation and transformation of water. Spleen yang deficiency leads to retention of dampness

and water accumulation which encumbers the function of the heart. The heart and kidneys are the main organs involved in the pathogenesis of HTN.

Patients with HTN may present with a red complexion, dizziness, or tinnitus. In this case liver/kidney yin deficiency and/or liver blood deficiency may be the underlying causes (Ross, 1985). Yin is heavy and descends, while yang rises. When yin is deficient it cannot hold the yang and yang unrestrained results in blazing fire through the yin channels, namely, the heart. In HTN, Kidney yin and yang may be deficient at the same time (Bensky & Barolet 1990).

Liver qi stagnation can also instigate hypertension. When the qi is stagnant heat develops. Heat can aggravate the heart. If the heat becomes very hot (fire) it may congeal and stagnate the blood in the chest preventing nourishment to the heart. This could manifest as sharp pain in the chest, palpitations, insomnia, or a darkish complexion (Bensky & Barolet 1990). As well, the movement of heat and fire can become reckless, as is the nature of fire, result in hemorrhagic stroke.

Fullness in the chest is another sign of HTN and is associated with the liver/gall bladder system. This is because liver/gall bladder energy spreads up and out like green plants growing in the springtime. If there is an obstruction of phlegm, for instance, this natural movement results in a feeling of oppression or fullness.

HTN can originate from different organ systems. It may progress from excess, deficiency or both (Yin Yang House staff, 2006). It often involves the organ systems of the heart, kidney, liver and spleen.

Treatment of Hypertension (HTN)

The first line of treatment for primary HTN is a healthy lifestyle, i.e. losing weight, quitting smoking, eating a healthy diet, exercising, and limiting intake of alcohol. The first line of pharmaceutical treatment will often be a diuretic. Angiotensin-converting enzyme (ACE) inhibitors are often a choice for a people with diabetes. Other drug options include angiotensin receptor blockers (ARBs), beta-blockers, calcium channel blockers, alpha-blockers, alpha-agonists, and renin inhibitors (WebMD,

2009).

More recently, physicians have begun to use spironolactone to increase the efficacy of other antihypertensive medications and as a treatment option for secondary HTN. Spironolactone is a potassium-sparing diuretic and an aldosterone antagonist with anti-androgen activity. It can be significantly effective for the treatment of resistant or secondary HTN, especially with those patients exhibiting primary aldosteronism (De Souza, et. al., 2010). Among the 5-10% of the hypertensive population with secondary HTN, the pathology with highest prevalence is primary aldosteronism. Treatment centers around administration of spironolactone, which has an anti-androgen effect and can result in side effects such as gynecomastia (Berardesca, et. al., 1988; Sowers, Whaley-Connell & Epstein, 2009). Therefore, one of the only antihypertensive medications with demonstrated effectiveness in treating secondary HTN would directly interfere with the metabolism of testosterone injections.

Acupuncture Research There are no studies on the effectiveness of acupuncture for the treatment of HTN in FTM testosterone treated individuals. Therefore we looked at comparable studies on HTN, metabolic disorders and menopause. Studies have shown acupuncture can successfully manage primary HTN (Li & Longhurst, 2010; Yang, 2010), secondary HTN in the case of metabolic disorders such as PCOS (Stener-Victorin et al., 2008) and hormone regulation in menopausal women (Sunay et al., 2011).

Multiple studies have been conducted on the treatment of HTN with acupuncture. One study claimed acupuncture's long term effectiveness in reducing elevated blood pressure in a population with mild to moderate HTN, with the application of electrical stimulation at "PC 5-6 and ST 36-37 using low current and low frequency. The effect is slow in onset but is long-lasting (Li & Longhurst, 2010)." Another study claims antihypertensive effects with acupuncture at points LI-11 and LR-3 (Yang, 2010). This study compared the 24-hour cycle of diastolic and systolic blood pressure among two 30-member groups of young patients with HTN, after 14 days of treatment with either electro-acupuncture at LI-11 and LR-3 or the antihypertensive medication Captopril taken orally twice a day. During the 24-hour continuous reading the acupuncture treatments achieved a clear reduction in systolic and diastolic pressure (all $P < 0.01$). The Captopril treatment did as well (all $P > 0.05$), but the antihypertensive effectiveness did not present significant statistical difference between the two therapies (Yang, 2010). This sug-

gests that acupuncture treatments may have an advantage of both achieving a statistically similar anti-hypertensive effect to western medication while lacking the side effects that western antihypertensive medications can create.

The limitations of both of the above studies is the lack of full disclosure; the only information available is the abstracts since the studies' full texts are in Chinese. However, a third 2010 study at New York's Columbia University demonstrated that acupuncture is effective in reducing resting blood pressure in healthy subjects, possibly via the mechanism of lowering sympathovagal balance. Results demonstrated significant differences in systolic blood pressures during rest (114 +/- 4 vs. 108 +/- 3 mmHg) for the acupuncture treatment ($p < 0.05$) and no significant effect was found during the sham treatment (Carpenter, et. al., 2010). This significant study furthers the argument for the need for research in the United States to provide more detail about the effect of acupuncture on HTN in various sectors of the population.

Acupuncture cannot only positively influence hypertension but it also influences the balance of the endocrine system, according to the following studies that examine its effects on polycystic ovary syndrome (PCOS) and menopause. The Journal of Neuroendocrinology published a 2008 review that looks at acupuncture's effect on regulatory and endocrine systems for the treatment of PCOS; a syndrome that is mimicked during FTM hormonal transition due to the high incidence of associated hyperandrogenism with PCOS (Stener-Victorin, et al.). The review determined that "clearly, acupuncture can affect PCOS via modulation of endogenous regulatory systems, including the sympathetic nervous system, the endocrine and the neuroendocrine system. Experimental observations in rat models of steroid-induced polycystic ovaries and clinical data from studies in women with PCOS suggest that acupuncture exert long-lasting beneficial effects on metabolic and endocrine systems and ovulation (Stener-Victorin, et al. 2008)."

According to a 2011 sham controlled clinical trial at the Ankara Training and Research Hospital acupuncture can help modulate the hormonal balance in menopause in addition to decreasing the severity of hot flashes and complaints using the Menopause Rating Scale (Sunay, et. al., 2011). Results indicate that luteinizing hormone (LH) levels were lower and oestradiol levels were significantly higher in the acupuncture group as compared to the sham group ($p=0.046$ and $p=0.045$, respectively) (Sunay,

et al., 2011). Due to the beneficial effects of acupuncture in reducing symptoms associated with hormonal imbalances which interface with the sympathetic nervous system, it is not implausible that the effect of acupuncture on HTN due to a testosterone supplementation may create a significant result.

There are no studies comparing pharmacological treatment and acupuncture treatment of HTN. There are also no studies which specifically investigate HTN associated with testosterone injections in the FTM population. We will be interviewing several practitioners in Portland and other cities who are treating or have treated this population throughout the transitioning process, in order to gather more data regarding incidence of hypertension and associated side effects of T injections. As well we hope to learn about the variety of modalities that have been successful in mitigating these side effects.

TCM Pattern differentiations for hypertension are already known, and allopathic medicine has clearly defined a set of associated symptoms of hypertension and pre-hypertension. Many pre-hypertensive symptoms are known possible side effects of testosterone supplementation in the FTM population, such as visceral body fat, elevated homocysteine, and increased C-reactive protein. TCM methodology gives us the ability to identify symptoms and differentiate syndromes with a high degree of sensitivity, and in so doing identify which side effects of testosterone therapy overlap with early pre-hypertensive symptoms in each patient. Early pre-hypertensive signs, not pharmologically treated by western allopathic medicine, can be safely, effectively and gently treated with TCM. When the risk factors are high but disease is not yet present we are fortunate to be able to provide preventive care.

The population using this therapy is growing, and the therapy is highly valuable for the mental and emotional well-being for FTM individuals. Conventional medical treatment for hypertension can create additional side effects, or lack effectiveness; therefore additional treatments are warranted. We predict that acupuncture will be an effective complementary therapy to reduce blood pressure while still allowing the full transition effect in secondary sex characteristics due to T-injection therapy. This pilot survey is the first necessary step to pursue this line of inquiry.

Research Methods and Design:

In order to answer the question, how severe is the epidemiology of secondary hypertension as-

sociated with the FTM T-injection therapy, we have created our own survey. This will more clearly define the need for further study into this particular side effect of T-injection therapy. In particular we aim to Determine the Prevalence of Hypertension and Incidence of Associated Side Effects of Intramuscular Testosterone Injections in the FTM Population. This survey will assist us to determine if the need exists to develop a Pilot Study to Determine Acupuncture's Effectiveness in Treating Hypertension in the FTM population.

Survey Development

The survey is comprised of a set of fifteen questions included in **Appendix E**. This survey, conducted via a secure email format, interviews FTM individuals across the United States and Canada about types of testosterone used and dosages, length of treatment, history of blood pressure, current blood pressure, any other systematic side effects such as acne, abdominal fat, edema, male pattern baldness, anxiety/depression, insulin sensitivity, virilization, elevated serum triglycerides, and any medication or complementary therapies used to counteract side effects such as hypertension.

Survey Distribution

A transgender email list-serve will function as a point of access into the FTM community. This yahoo email list-serve named "transnatural" was created by and for transgender people and health care practitioners who work as their allies and physicians. There is a focus on using "natural" methods for both transitioning and easing the side effects of transitioning, for both FTM and MTF. The list is open to the public but requires administrator approval of membership. The list-serve will reach FTM individuals directly, and it will also reach a large array of complementary and allopathic medical practitioners who are interested in working with or are currently working with the FTM community. To assist with survey distribution we will attend gatherings in the local (Portland) area that are associated with the target population, such as community potlucks and support group meetings. Attendees at these events will be informed of the survey and encouraged to sign up to receive the survey by email. Furthermore, we will personally contact medical practitioners in Portland who treat FTM transitioning patients. The aim of this recruitment strategy is to encourage practitioners to inform patients of the survey opportunity, and to allow them to volunteer to participate if they so choose. We will give the doctors small information sheets with a link to the online survey, which they can give to their patients if they choose. The patient will then decide whether they would like to participate or not.

Survey Security

The survey participants' personal information will be securely handled and the surveys anonymized. The survey will be administered via a secure email format using Google Forms. Google Forms creates a survey form that can be embedded into a webpage or accessed via email. The answers are sent to a separate spreadsheet in Google Forms with the survey results. No personal identifying information is collected. As a secondary safety measure, the spreadsheet is searched for any personal identifying data, which is deleted.

Potential Results and Discussion:

The surveys will be analyzed for statistics regarding T-injection usage (duration, type of testosterone, dosages, frequency), incidence of hypertension and pre-hypertension, family history of hypertension, incidence of an array of side effects of T-injections, and what types of other treatment modalities are being used simultaneously. This will allow us to form a more detailed picture of the need for a follow-up study, while at the same time helping to create a set of symptom patterns which can be used to begin the process of focusing on particular TCM differential diagnoses that will ultimately inform the methods of the clinical trial using acupuncture. We expect to have a high response percentage, with an estimated 20-30 responses. We would prefer to gather 50 responses, but we think that 30 responses would be adequate in order to proceed to the next step, which involves individual interviews in a clinical setting. We would like 10-20 individual interviews to gather more detailed syndrome differentiation and symptom pattern information. In combination with detailed personal interviews and practitioner questionnaires (which can be found in **Appendix F**), this information will facilitate the creation of TCM syndrome diagnoses associated with hypertension in the target population. In turn, this information will lead to a transparent process of acupuncture point selection for subsequent clinical trials.

The pilot study that follows this survey will be the first of its kind to investigate acupuncture's effectiveness in treating secondary hypertension due to testosterone therapy in FTM populations. This survey will gather baseline statistics on prevalence of types of syndrome diagnoses for secondary hypertension due to testosterone therapy in FTM individuals. Using this information, we will create a table of symptom patterns, their associated TCM syndrome diagnoses, and the associated acupuncture

point selections that are indicated for these TCM syndromes. In this way, we will create a replicable clinical trial to study the effect of acupuncture on specific TCM syndromes associated with secondary hypertension in the FTM testosterone-treated population.

We will have not only identified how secondary hypertension manifests as groups of associated symptoms in this population, but we will have also created a treatment strategy which can be reproduced in any TCM treatment setting. This will allow us to create a large-scale, collaborative study to determine the effectiveness of acupuncture in treating secondary hypertension due to testosterone therapy in FTM populations. Results of the final study could predict acupuncture's similar effect on hypertension due to other types of androgen therapy or hormonal imbalance of individuals across the gender spectrum.

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Appendix A

Trans Allies

Ideas for Allies of the Transgender and Intersex Communities

UC Riverside LGBT Resource Center 245 Costo Hall

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- 1. Don't assume you can tell if someone is intersexed or transgendered.** When addressing or speaking about any group of people, speak as though someone in the room might be TG or IS because, well, they might be!!!
- 2. Do not tolerate anti-trans or anti-intersex remarks or humor in public spaces.**
- 3. Report all anti-intersex or anti-trans harassment to the proper authorities.**
- 4. Display positive materials for transgendered and for intersexed persons.** If possible, display relevant posters or flyers.
- 5. Respect the confidentiality** of anyone who comes out to you as intersexed, transsexual, transgendered, or gender questioning. If your sense is that the person is “out” to everyone, ask just to be sure. (“Is there anyone with whom you prefer I not share this information?”)
- 6. Deal with feelings first.** If a person is coming out or dealing with painful experiences, you can help tremendously just by listening.
- 7. Know your own limits.** When you have reached the limits of your knowledge or patience, refer the person to an appropriate resource.
- 8. Use the pronouns of the gender they feel themselves to be.** For instance, if a person says that she identifies as female, use “she”/”her” – regardless of what kind of body that person may have been born into. If you are not sure which pronouns a person prefers, ask, “Which pronouns would you like me to use / do you prefer?” This is sign of respect and support.
- 9. Be patient** with a person who is questioning their gender identity. A person may shift back and forth before deciding on what gender expression best matches their identity. A person may ask to be called by one name one day, and another name another day. **Do your best to be respectful and call the person by the name they request.** Although it can be hard to refer to a person by a new name, a

gender questioning person will usually notice and appreciate your concerted effort to respect their wishes.

10. Never try to tell a person what “category” they fit into. For instance, if a person tells you that they feel they are “trapped in the wrong body,” it is inappropriate to respond with “Oh, that means that you are a trans- sexual.” A person has often spent their entire life being told what gender they are, and as a means of empow- erment a person should be allowed to choose the identities they feel best suit them.

11. Just as there is no one way to be male or female, there is no one way to be transgendered. Each person will choose a path that they feel is right for them; no one path is better than any other. A way to be supportive of finding this path is to **help a person find the best and most appropriate resources and information to be able to make informed decisions.**

12. Be aware that a transgender person who chooses to go through hormone therapy or undergo “sexual re- assignment surgery” will have to endure an often times long and frustrating process as they try to seek the mandatory medical approval to receive hormones or surgery.

13. A person who is transitioning from one gender to another may appear to be overly ob- sessed with the changes that their body is going through. For many people these changes are a great relief as they start to develop the body they have always wanted, and each change is a cause to celeb- rate. **Be patient** as a person explores the changes.

14. While a person’s sexual orientation is not directly connected to a person’s gender identity, some who are tran- sitioning may question previous understandings of their own sexual orientation and choose a new orientation label for themselves. **Don’t assume you know what someone’s sexual ori- entation is or is going to be.**

15. An intersexed person may have undergone painful surgeries without their consent that can have permanent effects on their life (e.g. reduced or absent sexual function, increased susceptibility to infec- tions, etc). This non-consensual violation of bodily integrity can have lasting emotional effects as well. Realize that because of these possibilities, **an intersexed person may not want to hear that infant genital surgeries are “for the best” or “necessary,”** since those judgments may ignore values that they hold dear.

16. Be wary of assuming that a common genital conformation is better than an unusual one. Many inter- sexed persons who have escaped non-consensual genital surgery (and, for that matter, many transgendered persons who have altered the appearance of their genitals in an uncommon way)

express satisfaction and even delight with their unusual bodies. The message behind genital surgeries is that there is something freakish and unacceptable about uncommon genital conformations, such that the person who has or had those genitals must be a “freak”. Such a message conveys extreme disrespect and can severely damage a person’s self-esteem.

17. If your family bears or adopts an intersexed child, get all the facts before making a decision about whether or not to choose to assign a gender to your child hormonally and/ surgically. Your doctors may strongly pressure you to submit your child to such treatments. Remember that the vast majority of intersexed conditions pose no health threat to the child.

18. The Intersexed Society of North America recommends assigning a gender socially but not medically until the child is of an age to declare his or her gender for him- or herself. In other words, give the child a gender-appropriate (or unisex) name. Stick to one set of pronouns. Advocate for your child in his or her school and insist on respectful treatment. Then, as your child matures, be open to the possibility that your guess as to his or her preferred gender expression may have been wrong; perhaps the child you raised as a boy will come to feel that she’d rather live as a girl/woman. Also be open to the possibility that your child will prefer a complicated and/or non-dichotomous gender expression. More than anything, love your child for who they are.

19. Historically speaking, transgender and intersex people have usually been targets of violence. This tradition continues today and is often based on the idea that gender is a rigid, bi-polar category that cannot be violated. A small but useful way to help change this is to **examine your own ideas of gender stereotypes and challenge those around you to do the same.**

20. If someone assumes that you are transgendered or intersexed just because you are an TG/IS ally, don’t rush to deny it. You might try to determine why someone is asking. If you feel a strong urge to deny it, examine that discomfort and the reasons behind it.

21. Remember: above all, **transgender and intersex people are individual human beings who deserve respect and understanding.**

(UC Riverside LGBT Resource Center, 2010)

Appendix B

Common Language

Cross-dresser – Someone who wears clothes of another gender/sex.

Drag - The performance of one or multiple genders theatrically.

Drag King – A person who performs masculinity theatrically.

Drag Queen – A person who performs femininity theatrically.

FTM / F2M - Abbreviation for female-to-male transgender or transsexual person.

Gender Identity – A person’s sense of being masculine, feminine, or other gendered.

Gender Normative – A person who by nature or by choice conforms to gender based expectations of society. (Also referred to as ‘Genderstraight’.)

Gender Variant – A person who either by nature or by choice does not conform to gender-based expectations of society (e.g. transgender, transsexual, intersex, genderqueer, cross-dresser, etc.).

Genderqueer – A gender variant person whose gender identity is neither male nor female, is between or beyond genders, or is some combination of genders. Often includes a political agenda to challenge gender stereotypes and the gender binary system.

Intersexed Person – Someone whose sex a doctor has a difficult time categorizing as either male or female. A person whose combination of chromosomes, gonads, hormones, internal sex organs, gonads, and/or genitals differs from one of the two expected patterns.

Trans - An abbreviation that is sometimes used to refer to a gender variant person. This use allows a person to state a gender variant identity without having to disclose hormonal or surgical status/intentions. This term is sometimes used to refer to the gender variant community as a whole.

Transgendered (Trans) Community – A loose category of people who transcend gender norms in a wide variety of ways. The central ethic of this community is unconditional acceptance of individual exercise of freedoms including gender and sexual identity and orientation.

Transphobia – The irrational fear of those who are gender variant and/or the inability to deal with gender ambiguity.

Transsexual – A person who identifies psychologically as a gender/sex other than the one to which they were assigned at birth. Transsexuals often wish to transform their bodies hormonally and surgic-

ally to match their inner sense of gender/sex.
(UC Riverside LGBT Resource Center, 2010)

Appendix C

How to Accurately Capture Data on Trans Clients

We strongly encourage the use of a two-question method to accurately collect data. Change ALL intake forms in the agency to contain at least the following two questions:

What is your current gender? (Check all that apply)

- Male
- Female
- TransMale/Transman
- TransFemale/Transwoman
- Genderqueer
- Additional Category (Please Specify): _____
- Decline to State

What sex were you assigned at birth?

- Male
- Female
- Decline to State

This may be more information than your funders require. But we want to encourage you to collect such information since it is better to collect more information in order to capture the data correctly, communicate inclusivity to your clients, and accurately reflect the clients you are serving. This extra information can be condensed later for reporting purposes.

(Center of Excellence for Transgender Health, 2011)

Appendix D

Below you will find three injectable esters commonly used by trans men for testosterone therapy, reproduced from Hudson's FTM Guide:

“Testosterone enanthate: Chemical formula C₂₆H₄₀O₃

Testosterone enanthate is one of the main forms of testosterone prescribed to trans men in the United States. It is a slow-acting ester with a release time between 8-10 days. The name-brand of T-enthate available in the United States is called "Delatestryl," which is suspended in sesame oil. Testosterone enanthate is typically injected anywhere between once every week to once every three weeks. Generic testosterone enanthate can also be obtained through a compounding pharmacy; such pharmacies can mix T-enthate in sesame, cotton seed, or any other appropriate oil.

Testosterone cypionate: Chemical formula C₂₇H₄₀O₃

Testosterone cypionate is the other main injectable form of testosterone prescribed to trans men in the United States. It is a slow-acting ester with a release time between 8-10 days, similar to that of enanthate. The name-brand of T-cypionate available in the United States is called "Depo-Testosterone," which is suspended in cottonseed oil. Testosterone cypionate is typically injected anywhere between once every week to once every three weeks. Generic testosterone cypionate can also be obtained through a compounding pharmacy; such pharmacies can mix T-cypionate in sesame, cotton seed, or any other appropriate oil.

Sustanon

"Sustanon" is the brand name for two formulas of injectable testosterone that contain a blend of esters. "Sustanon 100" contains three testosterone esters: testosterone propionate (C₂₂H₃₂O₃), testosterone phenylpropionate (C₂₈H₃₆O₃), and testosterone isocaproate (C₂₅H₃₈O₃). "Sustanon 250" contains four testosterone esters: testosterone propionate (C₂₂H₃₂O₃), testosterone phenylpropionate (C₂₈H₃₆O₃), testosterone isocaproate (C₂₅H₃₈O₃), and testosterone decanoate (C₂₉H₄₆O₃). Both formulas feature fast-acting and slow-acting esters, and can be injected anywhere from once every week to once every four weeks. Sustanon is prescribed outside of the United States.”

Appendix E

Survey: Transitioning with Testosterone Therapy

Thank you for supporting our endeavor. We are working to create a pilot study that can assess the effectiveness of acupuncture's in reducing high blood pressure associated with androgen therapy. As a first step we are conducting this survey.

If you would like acupuncture treatments at the Oregon College of Oriental Medicine Clinic, indicate below and we will contact you. Thanks again!

*Indicates a Required Response

1. Are you currently receiving testosterone therapy? *Yes / No (If No, you are finished with the survey)

2. If so, how is the testosterone currently being administered? *

- Intramuscularly
- Transdermally
- Orally
- Other:

3. If you're receiving intramuscular testosterone, what type of testosterone ester is used? *

- Testosterone Enanthate (Ex. Delatestryl)
- Testosterone Cypionate (Ex. Depo-Testosterone)
- Sustanon 100
- Sustanon 250
- Don't Know
- Other:

4. How frequently is this form of testosterone being administered? *

- Daily
- Weekly
- Every two weeks
- Once a month
- Every 3 months
- Other:

5. What is the dosage of testosterone? *

- 0-10mg
- 11-20mg
- 21-50mg
- 51-100mg
- 101-150mg
- 151-200mg
- 201-250mg
- 251-300mg
- 301-400mg
- Other:

6. How long have you been receiving this form of testosterone therapy? *

- 0-1 month
- 2-3 months
- 4-7 months
- 8-12 months
- 1-2 years
- 3-5 years

- greater than 5 years
- greater than 10 years
- Other:

7. Have you ever used a different form of testosterone therapy? If so, what type and for how long?

8. What is your most recent blood pressure reading, and what date was it taken?ex. 136/90 on July 23, 2011

9. What was your blood pressure prior to receiving androgen therapy? What approximate date was this taken?ex. 136/90 in February 2009

10. How is your blood pressure currently categorized? *

- Low
- Normal
- Borderline-High
- High
- Very High
- Unknown/Unsure

11. Immediately prior to beginning testosterone therapy, how was your blood pressure categorized? *

- Low
- Normal
- Borderline-High
- High
- Very High
- Unknown/Unsure

12. Do any of your immediate family have high blood pressure? If so, what is their relation to you? *If you know any specific numbers please provide them; if not, a general idea is fine.

13. If you currently do have high blood pressure (over 140/90), what action or therapy do you take in order to decrease your blood pressure, if any?ex Herbal diuretic consisting of: (list herbs here)

14. Are you currently experiencing any of these common side effects of androgen therapy? Please check all of the boxes that apply to you.

- Abdominal Obesity (weight gain around the belly like an apple shape)
- Edema: Swollen feet, legs, hands, or arms
- Acne
- Headache
- Male Pattern Baldness
- Abnormal Liver Tests or Blood Tests (red blood cells in particular)
- Worse Cholesterol Profile (decreased HDL and increased LDL)
- Nausea
- Polycystic Ovary Syndrome
- Emotional Lability: Depression, Increased Anger or Aggression
- Other:

15. Would you like to help us further our knowledge about this therapy? Please indicate your level of involvement below. You can choose more than one. *We will contact you for a follow-up ONLY if you choose so.

- I would be willing to participate in an interview as part of this study.
- I would be willing to receive acupuncture treatments at OCOM as part of this study.
- Please update me in the future about the results of this study.
- Thank you, this questionnaire will be enough.

- Other:

Appendix F

Dear _____,

Hello, my name is Beth Griffing. I have contacted you because you are listed on the Q Center's online Transgender Resource Directory. I am a master's student at the Oregon College of Oriental Medicine, and I'm writing a research paper about the effects of testosterone injections in the FTM population. My research partner Hannah Becker and I are interested in interviewing you regarding your experiences with this population, in order to help inform the details of our study and to gain greater insight into treatment options, side effects, and the whole multifaceted experience of transitioning.

The ultimate goal of this paper is to gather demographic and treatment data from which to create a prospective study in the form of a small clinical trial. The trial would determine the effect of acupuncture on hypertension associated with testosterone injections in the FTM transitioning population.

- If you would be willing to answer the questions below and either mail them back in the provided return envelope or email them to us, we will first of all be thankful for your important input in this endeavor. We would like to include your responses in the appendix of our current paper, with full acknowledgement. When completed in August, the research paper will be available at the OCOM library. Eventually we plan to publish this paper, and will send you a copy prior to publication.

We would also like to invite you to participate in the collaborative process of creating a clinical trial that can be implemented across the Portland area and possibly other cities and countries as well. We recognize the importance of bringing to light the treatment options for this traditionally marginalized population, and we appreciate the excellent work and acceptance you have provided in this context. Thank you so much for your time. Please contact me by email or phone with any questions you may have.

Sincerely,

Elizabeth Griffing

Questionnaire:

1. What is your area of specialty?
2. What kind of experience do you have with treating FTM hormonally transitioning patients? Please include numbers of patients if you have them, time span, and what aspect(s) of the transition you work with.
3. What is the most prevalent type of androgen therapy used, in your experience? Please include most common dosages and frequency of administration if you have that information.
4. What kinds of side effects of androgen therapy have you noticed? The most pronounced? The most dangerous? The most troublesome to the patient?
5. Have you monitored blood pressure throughout their transition? Have you noticed any interesting changes in blood pressure?
6. What are some of the biggest challenges that FTM patients face?
7. Do you have any sense of the prevalence of FTM transitioning within the general Portland population?
8. What kinds of treatments do you provide for this population?

9. Have you noticed any interesting reactions to your treatments?

10. What is the incidence of FTM patients who remain in good health throughout the entire process, in your experience? Do you have any insight regarding why they weather the transition more easily?

11. Do you ever recommend acupuncture as a complementary therapy? If so, how often and in what kinds of FTM individuals?

12. Do you have any specific resources that you use or that you refer patients to use? Do you work with or know of other practitioners in the Portland area that work with this population?

13. Do you have anything else to add? Do you have any concerns or advice regarding a study of this nature?

Thank you so much for your time.