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Respiratory Function in Transgender and Gender Diverse Individuals on Testosterone Therapy: A Comparative Study

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Disclosures

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Financial Disclosures

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Non-financial Disclosures

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Financial Disclosures

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Non-financial Disclosures

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Financial Disclosures

- No relevant financial relationships to disclose

Non-financial Disclosures

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Non-financial Disclosures

- Nothing to disclose

Disclosures continued

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Non-financial Disclosures

- Nothing to disclose

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Financial Disclosures

- Founder and clinician at Wellness Group for Voice, Speech, and Swallowing, LLC
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Non-financial Disclosures

- Nothing to disclose

Defining Terminology

Sex assigned at birth – Label assigned at birth by doctor based on genital anatomy and chromosomes

Gender - Social and legal status influenced by societal expectations and based on an individual's identity and feelings.

Gender diverse – Noting or relating to a person whose gender identity or gender expression does not conform to socially defined binary gender norms.

Transgender – Gender identity that does not correspond to sex assigned at birth.

Cisgender – Gender identity corresponds to sex assigned at birth.

https://www.uwmedicine.org/provider-resource/lgbtq/lgbtq-inclusion-glossary

Background

- Interpretation of pulmonary function tests (PFT) is common practice in assessing respiratory function of individuals – including gender diverse individuals who were assigned female at birth
- Interpretation of PFTs for these individuals is challenging
  - Cisgender norms for forced vital capacity (FVC) and forced expiratory volume in 1 second (FEV1), and FVC/FEV1 ratio are based on sex, race, age, and height (Quanjer, et al., 2012)
  - Cisgender norms for maximum inspiratory pressure (MIP) and maximum expiratory pressure (MEP) are more debated but fall between a general range based on age and biological sex (Evans and Whitelaw, 2009)

- Impact of gender-affirming hormone therapy – testosterone – on pulmonary function has not been investigated
- Known impact of testosterone therapy
  - Higher lean body mass
  - Lower body and subcutaneous fat
  - Greater muscle strength
  - Thickening of vocal folds

(Irwig, 2016)

Haynes and Stumbo (2018)

- Using a non-assigned birth sex in diagnosing subjects with airflow obstruction can have a significant impact on test interpretation of PFT values
- Consider birth sex and not gender alone when interpreting test results in an ethical and respectful manner
- Need for study with transgender individuals without airflow obstruction, on hormone replacement therapy

Purpose

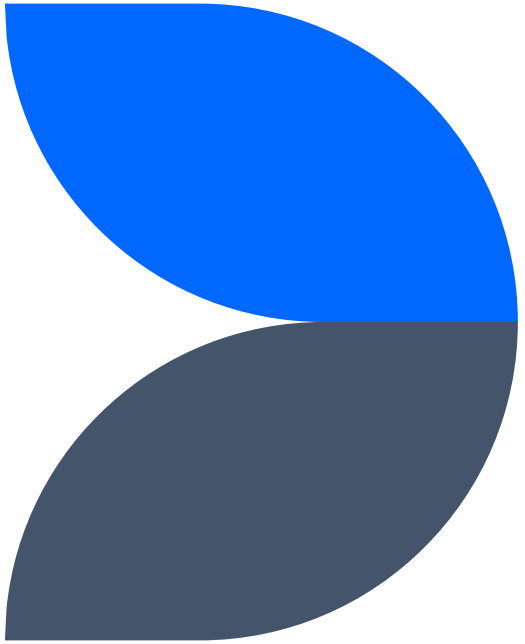
Investigating the respiratory capacity and strength of individuals who have undergone hormone therapy and comparing their results to established cisgender norms as well as a group of age, race, and biological sex matched peers will aid in the accuracy in PFT interpretation for this group.

Learner Outcomes

Contrast expected respiratory values when assessing transgender and gender diverse individuals compared to both cisgender male and female values

Describe respiratory changes that occur following testosterone therapy for the purposes of aligning gender identity in transgender and gender diverse individuals

Differentiate the significant impact of assigning gender when collecting respiration data with transgender and gender diverse individuals

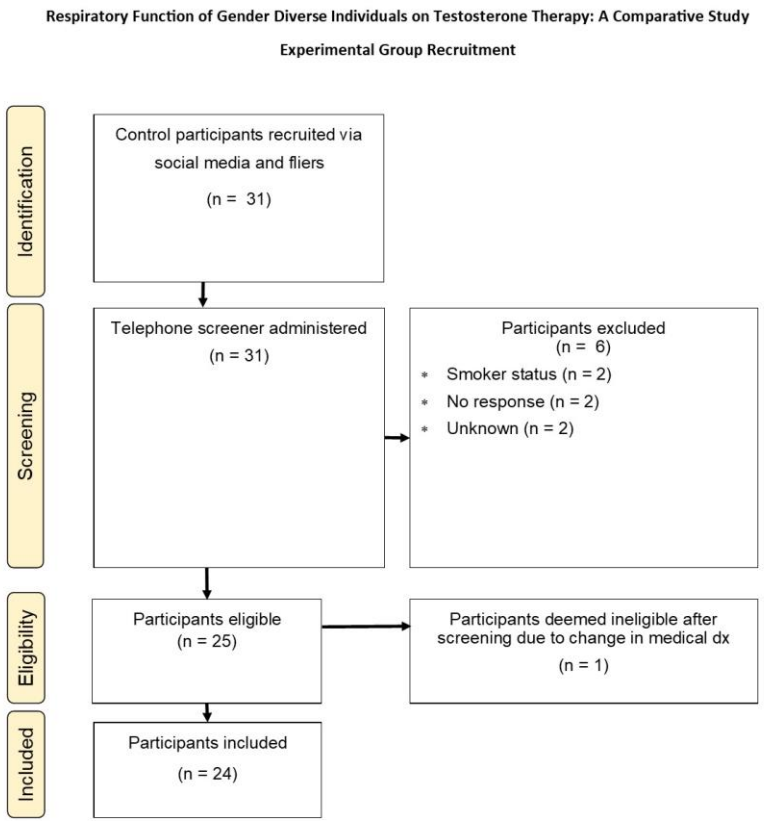


Participants

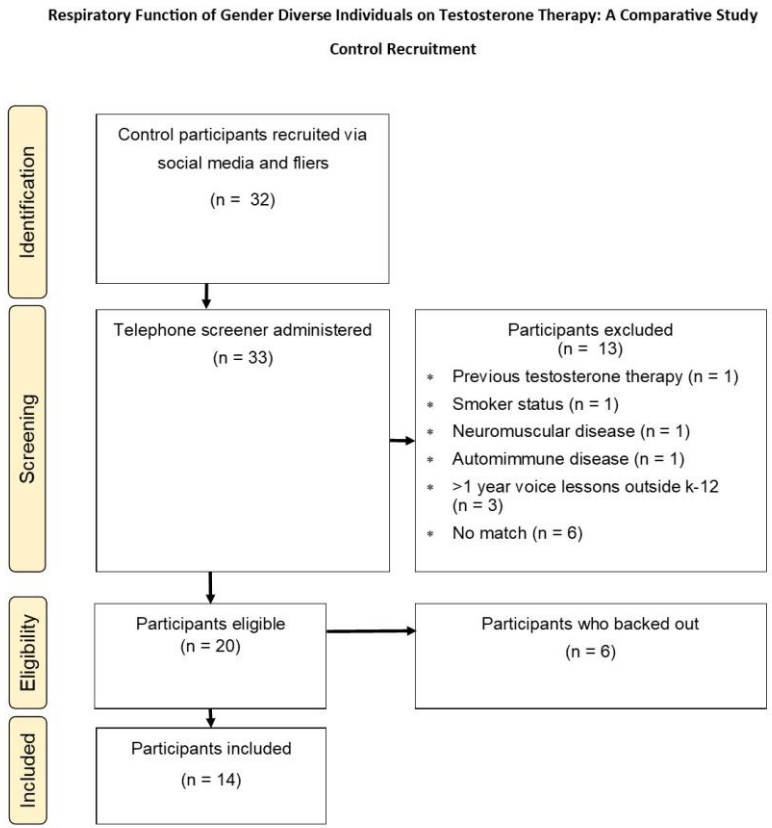
Participants:

- Experimental group (GDV)
  - Assigned female at birth, non-smoking, between ages 18-65, on testosterone therapy for at least 1 year
- Control group (CGF)
  - Assigned female at birth, non-smoking, between ages of 18-65, no history of testosterone therapy, matched by age and race to a member of the experimental group

Recruitment – Experimental Group



Recruitment – Control Group



Impact of Testosterone on Respiratory Support for Voice in Transgender Individuals

Research Study Opportunity

Researchers at Portland State University's (PSU) Department of Speech & Hearing Sciences are conducting a study of how testosterone therapy as part of medical treatment to align gender identity affects respiration and voice.

We are seeking control participants and you may be eligible to participate in this study if you:

- Were assigned female at birth
- Identify as woman
- Are between the ages of 18-65 years old
- Are a non-smoker or vaper of tobacco or nicotine products for at least the past 5 years
- Have had no more than 1 asthma attack in the past 6 months
- Do not have any other conditions that would lead to reduced respiratory strength such as: neuromuscular disease, pulmonary (other than asthma) or autoimmune diseases, etc.
- Have less than one year of consistent voice lessons outside of k-12 school

Participants will be asked to do the following:

- Complete a screening interview to determine candidacy
- Complete questionnaires relating to your gender, background, voice and respiration
- Undergo an examination of your respiratory capacity and strength
- Undergo examination of vocal quality and range through a series of voice tasks

Research data collection will occur at PSU. Participation is voluntary and all identifying information will be kept confidential. Participants will be scheduled for 1-hour appointments and receive $25 cash for taking part in this study.

Iconfinder.com

ARE YOU INTERESTED?
For more information or to schedule a screening interview contact Jillian River Browy at: jilbrowy@pdx.edu or call at (503) 548-8047

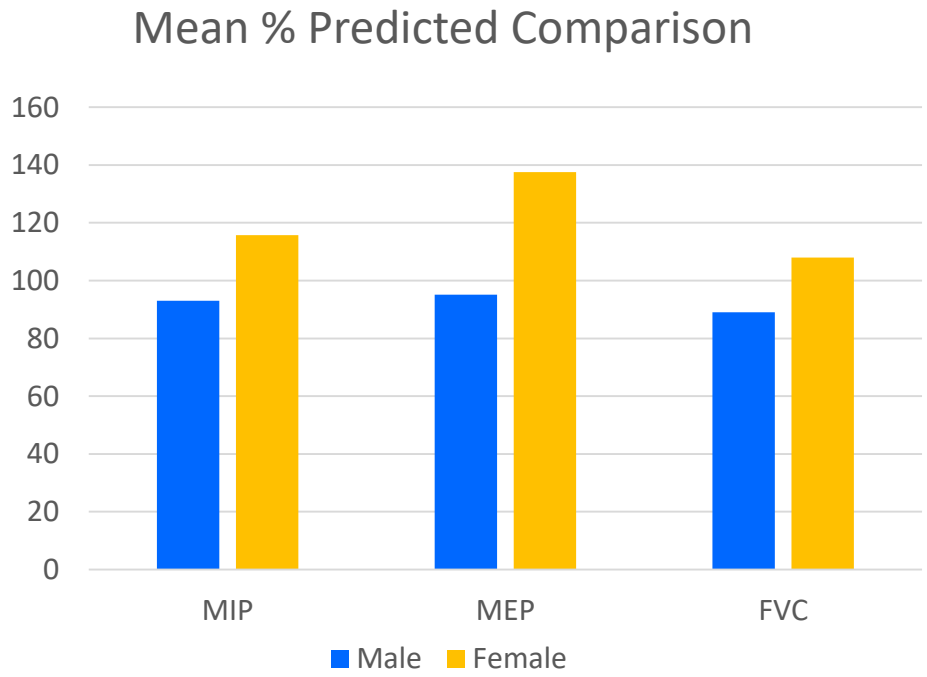
Methods

- Background, demographic data, and information regarding satisfaction with voice were collected via study-specific questionnaire and Voice Handicap Index 30 (VHI30)
- Primary outcomes of interest were measures of respiratory volume and strength, collected using EasyOne-PC Spirometer (NDD Medical Technologies, Inc.) for FVC measures and MicroRPM for values of MIP and MEP
- Assessed average of percent predicted for each measure, instances where participants fell below or above lower limit of normal (LLN) when compared to cisgender norms (Quanjer et al, 2012, Evans and Whitelaw, 2009) and compared results between matched pairs.
- Voice data collected using Computerized Speech Lab (CSL) and Phonatory Aerodynamic System (PAS)

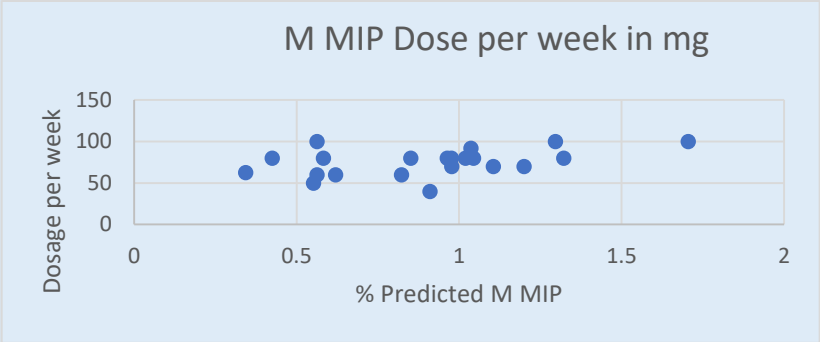
Preliminary Respiration Results

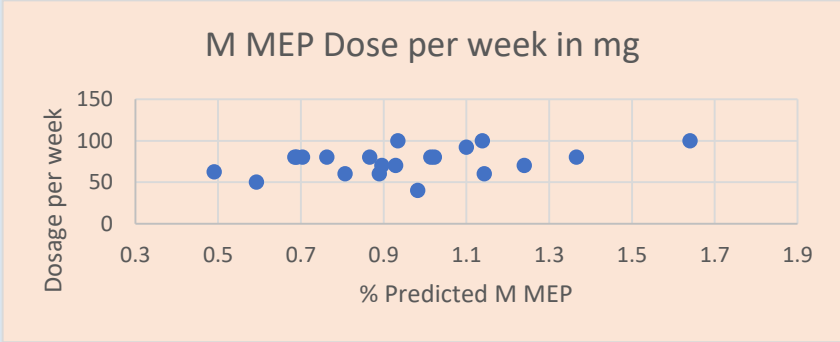
Male Norms	Mean % Predicted	Standard Deviation	Range	Number Below LLN
MIP	92.97%	32.28%	34.37%-170.55%	2
MEP	95.97%	24.61%	48.06%-164.05%	2
FVC	89%	10.55%	71%-110%	3

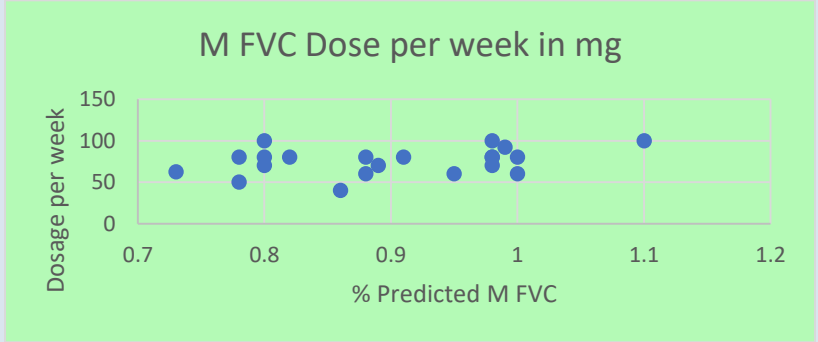
Female Norms	Mean % Predicted	Standard Deviation	Range	Number Below LLN
MIP	115.77%	41.77%	40.44%-219.79%	1
MEP	137.6%	39.77%	68.33%-247.88%	1
FVC	108%	12.75%	85%-136%	0



Impact of testosterone dosage







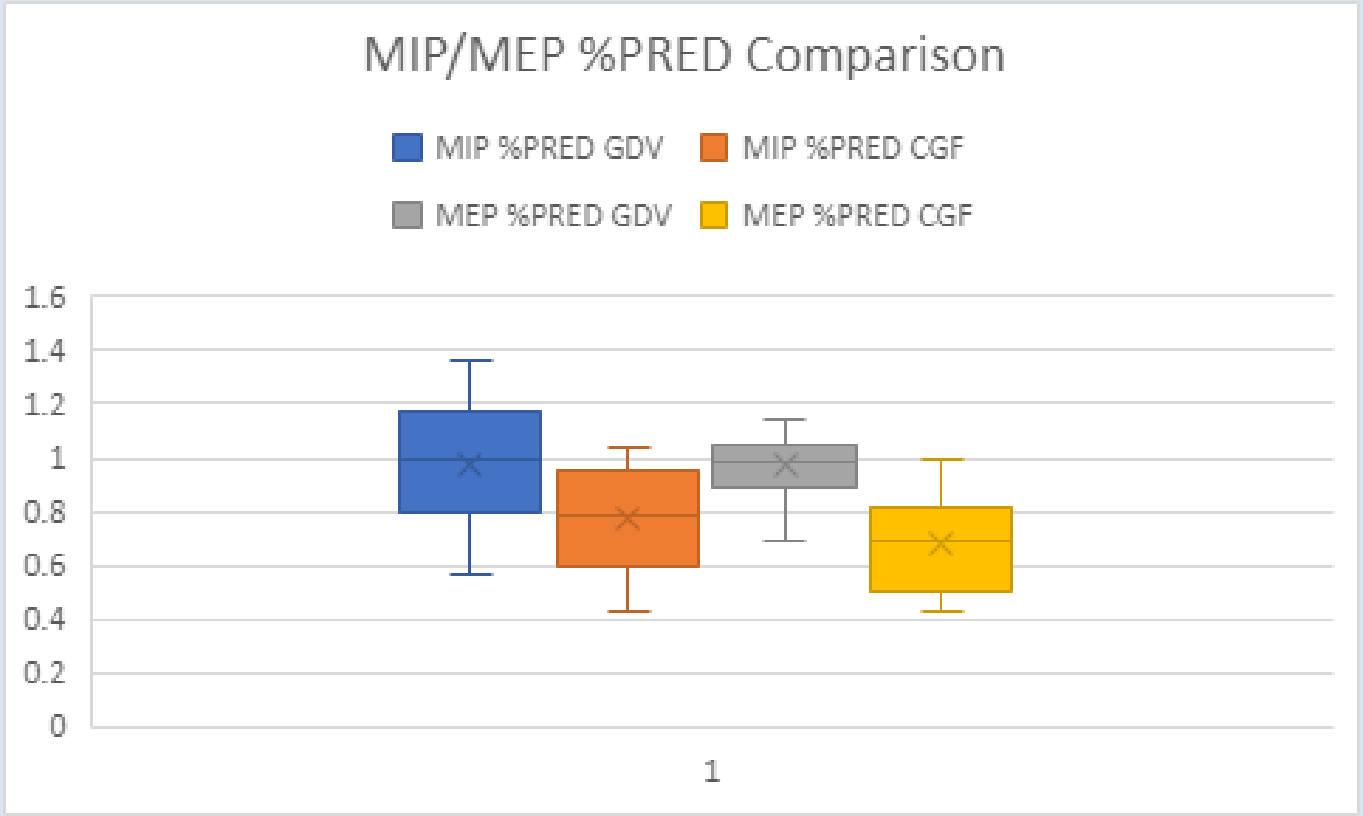
Male	Pearson Correlation	Sig (2-tailed)
MIP	.434*	.049
MEP	.399	.073
FVC	.334	.139

Female	Pearson Correlation	Sig (2-tailed)
MIP	.434*	.049
MEP	.383	.086
FVC	.352	.117

Comparing respiration volume and strength between matched pairs

COMPARISON OF DATA USING CISGENDER FEMALE NORMS							COMPARISON OF DATA USING CISGENDER MALE NORMS					
	MIP %PRED		MEP %PRED		FVC %PRED		MIP %PRED		MEP %PRED		FVC %PRED	
	GDV	CGF	GDV	CGF	GDV	CGF	GDV	CGF	GDV	CGF	GDV	CGF
Mean	121%	92%	138%	98%	110%	109%	97%	77%	97%	68%	91%	91%
SD	31%	20%	17%	26%	12%	14%	25%	18%	12%	18%	10%	11%
Range	66%-164%	51%-127%	99%-167%	60%-135%	85%-127%	90%-129%	56%-136%	43%-104%	69%-114%	43%-100%	71%-105%	75%-108%
N below LLN	0	1	0	5	0	0	0	2	0	5	2	1

Comparing respiration volume and strength between matched pairs



Conclusions/Discussion

- Percent predicted values were higher when analyzed using cisgender female norms but fell between what was expected for cisgender females and cisgender males.
- Testosterone intervention may be associated with strengthening of pulmonary function in gender diverse individuals assigned female at birth, most prominently with measures reflecting respiratory muscle strength.
- Dosage seems to be more of an indicator than testosterone level.
- When working with transgender and gender diverse clients, consideration of hormonal intervention and sex assigned at birth are important factors in interpreting PFTs.
- Further studies with larger and more diverse participant cohorts are warranted to build on this preliminary data.

Thank you for your time!

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