

OFP

Osteopathic Family Physician

THE OFFICIAL PEER-REVIEWED
PUBLICATION OF THE AMERICAN
COLLEGE OF OSTEOPATHIC
FAMILY PHYSICIANS

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RESEARCH ARTICLE

Stimulating the Use of OMT
in Primary Care Offices via
Point-of-Care Reminders

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Obsessive-Compulsive Disorder:
Diagnosis and Management with
an Osteopathic Component

Osteopathic Manipulative
Treatments for Pediatric Conditions

Principles of Transgender Care for the
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Gender Transitioning: Medical
Options

Middle Ear Infection: How OMT
Can Help



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In order to relieve some of the financial burden for residents entering the field, the ACOFP Education & Research Foundation is pleased to announce its Initial Certification Grant call for applications for the spring 2021 cycle.

The deadline for applications is February 7, 2021.



Eligibility Requirements

To be eligible for this opportunity, you must be a third-year resident member of ACOFP planning to sit for both the American Osteopathic Board of Family Physicians written (cognitive) exam and the OMT Performance Exam (practical). Residents participating in either the AOBFP Early Entry Initial Certification pathway or the AOBFP traditional initial certification pathway are encouraged to apply.

Learn more:
acofpfoundation.org

Guide for

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MARCH 11–14, 2021

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ANNUAL CONVENTION & SCIENTIFIC SEMINARS

Official Notice to the ACOFP Membership

Proposed Amendments to the ACOFP Constitution & Bylaws

According to the Constitution of the American College of Osteopathic Family Physicians, Inc.

Article IX – Amendments: Section 1. This Constitution may be amended at any annual meeting of the Congress of Delegates by a three-fourths vote of the total number of delegates credentialed for voting, provided that the proposed amendment shall have been filed with the Executive Director of the College at least 60 days before the first day of the meeting of the Congress of Delegates and that the Executive Director shall have notified the membership of the College in writing of the proposed amendment at least 30 days preceding the first day of the meeting of the Congress of Delegates.

Section 2. All amendments to the Constitution shall not be effective until they are submitted to and approved by the Board of Trustees of the AOA.

The ACOFP Board proposes the following amendments to the Constitution to allow Medical Doctors (MDs) to be Active Members of the ACOFP, as recommended by the 2018 ACOFP Congress of Delegates. Approval of the amendments will be voted on at the ACOFP Congress of Delegates at its 2021 meeting. If adopted by the ACOFP Congress of Delegates, approval will be sent to the American Osteopathic Association Board of Trustees for approval. (New material in all caps and old material in strike out.)

CONSTITUTION OF THE AMERICAN COLLEGE OF OSTEOPATHIC FAMILY PHYSICIANS, INC.

ARTICLE II – MISSION & OBJECTIVES

Section 2. The objectives of the College are:

3. To support To support high standards of ongoing osteopathic education for family physicians;
5. To encourage and improve the educational opportunities for the training of family physicians in all branches of osteopathic medicine and surgery, including the osteopathic family medicine training programs WITH OSTEOPATHIC RECOGNITION STATUS;

ARTICLE IV – MEMBERSHIP

The membership of this College shall consist of osteopathic family physicians, ALLOPATHIC FAMILY PHYSICIANS and such other persons who have met the requirements of membership prescribed by the ACOFP Bylaws.

ARTICLE VII – BOARD OF GOVERNORS

Section 1. The Board of Governors shall be composed of the President, President-Elect, the Past Presidents for the preceding two years, Vice President, Secretary/Treasurer, six (6) Governors-at-large, one osteopathic RESIDENT GOVERNOR OR ALLOPATHIC Resident Governor IN OSTEOPATHIC FOCUSED EDUCATION AT A FAMILY MEDICINE RESIDENCY WITH ACGME OSTEOPATHIC RECOGNITION STATUS, one osteopathic Student Governor, and the Speaker of the Congress of Delegates, all to be selected as provided in the Bylaws. The Speaker has voice but no vote.

BYLAWS OF THE AMERICAN COLLEGE OF OSTEOPATHIC FAMILY PHYSICIANS, INC.

ARTICLE III – MEMBERSHIP

Section 1. Qualifications

An applicant for membership, except as provided herein, shall be a graduate of a college of osteopathic medicine approved by the COMMISSION ON OSTEOPATHIC COLLEGE ACCREDITATION (COCA) OR A GRADUATE OF A COLLEGE OF ALLOPATHIC MEDICINE APPROVED BY THE LIAISON COMMITTEE ON MEDICAL EDUCATION at the time of graduation and shall be licensed to practice medicine. Each applicant shall be of good moral character and shall conform to the ACOFP Code of Ethics.

Section 3. Active Members in Good Standing

The phrase "in good standing" shall describe only those active members whose dues and assessments are current, and who document CME hours consistent with the AOBFP OR AMERICAN BOARD OF FAMILY MEDICINE (ABFM) requirements, and who are in compliance with the ACOFP Code of Ethics. National officers, affiliate officers, and residency program directors must be members in good standing.

Section 3. Active Members in Good Standing

The phrase "in good standing" shall describe only those active members whose dues and assessments are current, and who document CME hours earned within a three-year period of educational programs consistent with the AOBFP OR AMERICAN BOARD OF FAMILY MEDICINE (ABFM) requirements, and who are in compliance with the ACOFP Code of Ethics. National officers, affiliate officers, and residency program directors must be members in good standing.

ARTICLE V – CONGRESS OF DELEGATES

Section 1. Composition

4. Each affiliate society shall be entitled to one voting medicine resident delegate who meets the following criteria.

- (a) Be currently enrolled and in good standing in an AOA or ACGME residency program in the state which the delegate represents
- (b) Be a member in good standing of the ACOFP affiliate society in the state (if such an affiliate society exists).
- (c) Be a member in good standing with ACOFP.

ARTICLE VI – BOARD OF GOVERNORS

Section 2. Composition

A. The Board of Governors shall consist of the President, President-Elect, the Past Presidents for the preceding two years, Vice President, Secretary/Treasurer, six (6) Governors-at-large, one Osteopathic RESIDENT GOVERNOR OR ALLOPATHIC Resident Governor IN OSTEOPATHIC FOCUSED EDUCATION AT A FAMILY MEDICINE RESIDENCY WITH ACGME OSTEOPATHIC RECOGNITION STATUS, and one Osteopathic Student Governor as provided for in the Bylaws.

ARTICLE X – DEPARTMENTS AND COMMITTEES

Section 2. Qualifications of Committee CHAIRS AND Members

Committee chairs shall be OSTEOPATHIC PHYSICIANS WHO ARE active members of this College in good standing, or academic or associate members of this College., OR ALLOPATHIC PHYSICIANS WHO MEET THESE REQUIREMENTS AND HAVE COMPLETED OSTEOPATHIC FOCUSED EDUCATION AT RESIDENCY PROGRAMS WITH ACGME OSTEOPATHIC RECOGNITION STATUS.COMMITTEE MEMBERS SHALL BE OSTEOPATHIC OR ALLOPATHIC PHYSICIANS WHO ARE ACTIVE MEMBERS OF THIS COLLEGE IN GOOD STANDING, OR ACADEMIC OR ASSOCIATE MEMBERS OF THIS COLLEGE.

ARTICLE V – CONGRESS OF DELEGATES

Section 1. Composition

B. ONE VOTING DELEGATE AND ONE ALTERNATE DELEGATE SHALL REPRESENT THE RESIDENT MEMBERS OF THE AMERICAN COLLEGE OF OSTEOPATHIC FAMILY PHYSICIANS. THE DELEGATES SHALL BE APPOINTED ANNUALLY BY THE RESIDENT COUNCIL OF THE ACOFP. THE RESIDENT COUNCIL SHALL CERTIFY ITS DELEGATE AND ALTERNATE DELEGATE TO THE ACOFP EXECUTIVE DIRECTOR IN WRITING AT LEAST 30 DAYS PRIOR TO THE FIRST DAY OF THE ANNUAL MEETING OF THE CONGRESS OF DELEGATES.

Section 1. Composition

C. ONE VOTING DELEGATE AND ONE ALTERNATE DELEGATE SHALL REPRESENT THE STUDENT ASSOCIATION OF THE AMERICAN COLLEGE OF OSTEOPATHIC FAMILY PHYSICIANS (STUDENT ASSOCIATION OF THE ACOFP). THE DELEGATES SHALL BE APPOINTED ANNUALLY BY THE NATIONAL STUDENT EXECUTIVE BOARD. THE NATIONAL STUDENT EXECUTIVE BOARD SHALL CERTIFY ITS DELEGATE AND ALTERNATE DELEGATE TO THE ACOFP EXECUTIVE DIRECTOR IN WRITING AT LEAST 30 DAYS PRIOR TO THE FIRST DAY OF THE ANNUAL MEETING OF THE CONGRESS OF DELEGATES.

EDITOR'S MESSAGE

Back to the Future

Ronald Januchowski, DO, FACFP, Editor, *Osteopathic Family Physician*

I hope your fall season is treating you well and that the pandemic has not created more dysfunction than can be handled by you and your loved ones. Professional hockey finished recently with the Tampa Bay Lightning taking the Stanley Cup. I am excited to start some non-professional hockey locally again with the easing of some pandemic restrictions. Here is hoping for a healthy and safe season.

The end of this year (I do not even want to mention its name) is closing in and I am pretty sure most people will be happy to see the calendar turn to the next one. Writing this message one month before the presidential election, I will mix my tenses and state that I hope you voted. Apologies to any grammar police. Speaking again in mixed tense, the OMED virtual meeting was incredible! This paragraph may induce some time continuum disruption, as there was no flux capacitor involved in writing this.

Taking care of first responders, fitting OMM into a busy clinic day, treating the mind, body and spirit of our patients, and creating empathy for all patients in our office, regardless of race, color, religion, sex (including pregnancy, gender identity and sexual orientation), national origin, disability, age (age 40 or older) or genetic information — sounds like a typical day in an osteopathic family physician's office. This *OFP* issue provides valuable information related to topics OFPs see in their "typical days." I feel these articles are timely and valuable to the practicing osteopathic physician. The Editorial Board works to make the *Osteopathic Family Physician* the premier journal for family medicine DOs. As always, we are interested in hearing from our readers regarding desired topics for articles or feedback on articles. Take care and enjoy the November/December 2020 issue!



PATIENT EDUCATION HANDOUTS

COVID-19 Patient Education Materials

Learn more about COVID-19 and how it affects specific health conditions in these printable and downloadable patient education materials.

- COVID-19 & Cleaning and Disinfecting Safely
- COVID-19 & Hand Sanitizers
- COVID-19 & Osteopathic Home Exercises for Caregivers
- COVID-19 & Protecting Yourself and Others
- COVID-19 & Symptoms
- COVID-19 & What to Do if You Are Sick
- COVID-19 & What You Can Do to Manage Your Symptoms at Home
- COVID-19 & What You Need to Know
- COVID-19 & What to Expect During Your Telehealth Appointment



OMT Patient Education Material

- Allergic Rhinitis: How OMT Can Help
- Back Pain: How OMT Can Help
- Knee Pain: How Osteopathic Manipulative Treatment Can Help
- Middle Ear Infection: How OMT Can Help
- Pelvic Pain: How OMT Can Help

The pdfs of these patient education handouts are available for easy download and distribution to your patients at www.acofp.org/PEH

CALENDAR OF EVENTS

DECEMBER 4-6, 2020

Indiana Osteopathic Association
Indianapolis, Indiana
inosteo.org

JANUARY 9, 2021

Kentucky Chapter of ACOFP
KOMA Winter Meeting 2021
koma.org

JANUARY 15-17, 2021

Iowa Society of the ACOFP
Midwinter Osteopathic Family
Practice Conference
acofp-ia.org

JANUARY 21-24, 2021

Missouri Society of the ACOFP
The Annual Winter Family
Medicine Update
msacofp.org

FEBRUARY 5-7, 2021

Michigan Association of Osteopathic
Family Physicians
MAOFP Winter Family Medicine
Update
maofp.org

FEBRUARY 12-14, 2021

Maine Chapter of the ACOFP
MOA Midwinter Symposium
maineacofp.org

FEBRUARY 13-14, 2021

North Carolina Society for the
ACOFP
Winter CME Conference
nc-acofp.org

FEBRUARY 10, 2021

Arizona ACOFP
AzACOFP Annual Meeting
and Social
az-osteo.org

MARCH 11-14, 2021

ACOFP 58th Annual Convention &
Scientific Seminars
acofp.org/acofp21

APRIL 23, 2021

Ohio ACOFP
Ohio Osteopathic Symposium
ohioacofp.org

APRIL 28-MAY 1, 2021

Pennsylvania Osteopathic Family
Physicians Society
POMA Clinical Assembly
poma.org

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FROM THE PRESIDENT'S DESK



Notorious RBG

Nicole Heath Bixler, DO, MBA, FACOFP
ACOFP President

In the medical profession, we utilize acronyms daily to simplify complex jargon and decrease our amount of writing (or more frequently typing). CHF, TKA, DM, SLE are just a few. You see it, you know it, you understand it. This is certainly true in other aspects of life, most notably in our world of texting: LOL, BRB, OMW, YOLO and IDK—the latter being how you may feel about all these letters. (Don't be ashamed if you had to look it up. It means "I don't know.") Although there are initials that seem to hold a significant meaning and it would be hard to find anyone who doesn't know what they stand for both literally and figuratively—RBG, Ruth Bader Ginsburg.

It only seems appropriate as I begin my term as the fourth female president in the 70-year history of the ACOFP that I recognize her legacy and contributions to gender equality. Ruth Bader Ginsburg is widely regarded as a feminist icon. Among her many activist actions during her legal career, she worked to upend legislation that discriminated based on one's gender, was a founding counsel for the American Civil Liberties Union's Women's Rights Project and taught numerous law courses on gender discrimination laws. She was eloquently outspoken in her disagreements with her colleagues' decisions in her tenure as a Supreme Court Justice. She notably ended her public dissenting opinions with her attributable statement, "I dissent."

A Facebook post I saw recently stated it simply; "If as a woman you have purchased a home in your name, have played sports in high school and consented to your own medical treatment, you can thank Justice Ginsburg."

What I find more remarkable about this woman is that she achieved her education, accolades and moral victories while balancing the elusive work-life balance with style. She was married for 56 years to her lawyer-husband, raised two children and set a new standard of fashion with her famous jabots. She persevered in her commitment to the highest court through personal losses and numerous bouts of cancer. It says something about her distinctive attire, her ability to resonate across generations and her iconic stature, when entire lines of merchandise and clothing have been created based on a black robe, lace collar and collection of powerful quotes. She served as an inspiration to many and has been respectfully honored through millions of social media posts. Thousands of mourners paid respects as she lay in state at the United States Capitol, an honor only bestowed upon 33 *men* before her.

No matter your political persuasion or your stance on particular issues, it is fair to say that the women and men of our country

owe a debt of gratitude for her relentless pursuit of justice and equality—a pursuit fueled by intelligence, sheer determination, collaboration and humility.

"Fight for the things that you care about but do it in a way that will lead others to join you." —Ruth Bader Ginsburg

As a mother, daughter, sister, wife and physician, I am fortunate to have had strong-willed, passionate, educated women such as the "Notorious RBG" break barriers that no longer exist in 2020, but there is still work to be done. I think an overwhelming need still exists for women to be in senior roles and positions of decision-making that reflect the concerns of half the population. These are roles both in our community and in our profession.

From the beginning of osteopathic medicine at the American School of Osteopathy, A.T. Still stated, "Women are admitted on the same terms as men. It is the policy of the school that there should be no distinction as to sex, and that all shall have the same opportunities."

As the number of female medical students now equals their male counterparts, it should stand to reason that the merit that earned those positions should translate to equal numbers of leadership positions in the future. Unfortunately, this is not where we are today. For gender equality in the workplace to become a reality, a priority needs to be placed on the acceptance of non-linear volunteerism, equity in pay, fair maternity/paternity benefits and the removal of the stigmas that are often associated with successful women.

"When I'm sometimes asked, 'When will there be enough [women on the Supreme Court]?' and I say, 'When there are nine,' people are shocked. But there'd been nine men, and nobody's ever raised a question about that."

—Ruth Bader Ginsburg

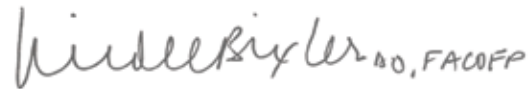
I am honored to be spoken in the same sentence as the only three other successful female family physicians who have led ACOFP as president: Drs. Mary Burnett, Jan Zieren and Carol Henwood. Their contributions cannot be measured by just the year of their presidency, but by all the other women who have followed them in similar paths to leadership.

In the coming months, I will be working with our Women's Leadership Committee, our National Student Executive Board and our communications staff to highlight these and many other amazing women in the osteopathic profession.

I look forward to the day when the number of female leaders at our medical schools and in our professional organizations will be

too numerous to count and will no longer be a statistic to track—when our communities are represented by women equally in the legislature, when C-suites are filled with women and when all people, regardless of gender or race, are treated equitably based on skills and ability to contribute. It is my hope that this will be the reality for my three daughters and the women who will lead ACOFP in the years to come.

Osteopathically yours,



Nicole Heath Bixler, DO, MBA, FCOFP



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RESEARCH ARTICLE

STIMULATING THE USE OF OMT IN PRIMARY CARE OFFICES VIA POINT-OF-CARE REMINDERS

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ABSTRACT: Primary care physicians, especially in family medicine, are more prone to use osteopathic manipulative treatment (OMT) than other specialists; however, barriers to OMT use exist. The purpose of this study is to evaluate if the frequency of OMT use in a family medicine outpatient setting is influenced by having posters promoting OMT in exam rooms and waiting rooms.

Methods: OMT posters were placed in two of four offices in an academic family medicine practice. Offices without posters served as the control group. Billing patterns were examined for the five months prior to and after poster placement. Report parameters included: age, gender, ethnicity, CPT code for OMT and somatic dysfunction ICD-10 codes.

Results: Data before and after poster placement were compared. Results showed a positive correlation between posters advertising OMT and OMT use. There was a 6.5% increase in OMT use in the offices that had posters advertising OMT.

Conclusion: This research showed that placing OMT posters in select family medicine offices resulted in an increase in OMT use. Possibilities for this increase include patients becoming more aware of the benefits of OMT and/or simply reminding osteopathic physicians of the benefits of OMT. Increased OMT utilization could lead to a decrease in pain medication prescribing and an increase in functionality through conservative measures.

INTRODUCTION

The principles and practice of osteopathic medicine encompass a profession centered on holistic patient care. One of the most distinguishing differences between osteopathic physicians and their allopathic counterparts is the use of OMT, which is employed to treat an array of medical conditions.¹ A.T. Still founded the osteopathic medical profession in 1892² and at the outset, manual medicine was greatly emphasized.³ However, since as early as the 1950s, there has been a steady decline in the use of OMT. Around the 1970s, there was a shift in the field where osteopaths became more specialized and “manipulative treatment [was] de-emphasized and [became] nonexistent.”³ One explanation for this downward trend could be an increasing number of osteopathic students who train in allopathic institutions as well as the recent

transition to a single accreditation system of post-graduate training, where programs are now accredited by the Accreditation Council on Graduate Medical Education (ACGME) instead of the American Osteopathic Association (AOA).⁴ Additionally, it has been shown that interest and training in OMT steadily declines through formal training.⁵ Possible reasons for this include time restraints, other professional interests, poor reimbursements, unsuitable facilities, lack of a philosophic environment and patients’ lack of interest in OMT, amongst other explanations.² Additionally, it has been shown that osteopathic physicians perform OMT less as their career progresses.⁶ These findings are concerning because they illustrate a decline in the use of OMT and in the status of osteopathic medicine as a field distinct from its allopathic counterpart. While most osteopathic physicians feel there are philosophic differences between osteopathic and allopathic medicine, they also feel that OMT is a distinguishing feature.⁴

OMT is a safe and effective treatment for various conditions, can be used at any age, and serves as a potential alternative to pain medications.^{7,8,9} OMT has been shown to help treat many musculoskeletal issues, including chronic low back pain and neck pain, and can lead to improvement of pain and function.¹⁰ One of the most common reasons for patients to visit their physician

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is low back pain, which is also a leading cause of disability.^{11,12} As OMT has been shown to be an effective treatment for chronic low back pain and is recommended by the American College of Physicians, implementing this treatment modality can be beneficial to patients.^{8,13} Applying effective nonpharmacologic treatments to chronic pain is especially important in light of the increasing number of people experiencing chronic pain and the opioid epidemic our nation is currently facing.^{14,15,16}

Finding ways to increase OMT implementation can be challenging. However, previous studies have shown that point-of-care health promotion and treatment reminders in the exam room can influence physicians.¹⁷ Additionally, it has been shown that patients appreciate health information materials in the office, such as leaflets and posters.¹⁸ Our study set out to explore whether point-of-care posters that promote OMT increase the frequency with which OMT is performed.

METHODS

Posters promoting and briefly describing OMT were placed in two of four family medicine offices in a large academic family medicine practice, with the offices without posters essentially serving as a “control.” The posters were created by the researchers and included a photo of OMT being performed with a brief description of OMT and a list of common diagnoses that can benefit from OMT (Figure 1). Of the four practice locations, two of the offices staff family medicine residents as well as attending physicians. The other two offices were staffed with attending physicians only. When selecting the offices in which to place the posters, one office with residents was chosen and one office with attending physicians only was chosen to minimize differences between the two groups. All four offices were located in a suburban area and were staffed with osteopathic family physicians. Physicians in these offices were not made aware of the presence of the posters, nor was the project brought to their attention. To track the use of OMT throughout the offices, an automated report examining billing patterns for the five months prior to and the five months during poster placement was obtained. Report parameters included the following: age, gender, ethnicity, CPT code for OMT and somatic dysfunction ICD-10 codes.

Regression Model

We have used a two-period probit regression model to estimate the effect of posters on the number of patients choosing OMT. The regression model is given below:

$$Y_{it} = \beta_0 + \beta_1 Intervention_t + \beta_2 X_{it} + \mu_{it}$$

The dependent variable Y_{it} is a binary variable that takes the value 1 if it is a patient from the experiment group and 0 if the patient is treated with OMT in the control group during time period t . The subscript i denotes the clinical group to which the patient belongs; experiment or control. Running the probit regression gives us the probability of a patient receiving OMT in the experiment group clinics compared to one of the control group clinics. The variable $Intervention_t$ is another binary variable that takes the value 1 if the patient is treated with OMT during the experiment phase and it takes the value 0 for OMT in the pre-experiment phase. X_{it} is the set of demographic variables like the patient’s age, gender, race,

FIGURE 1:
Point-of-care OMT poster



etc. For our analysis, β_1 is the main coefficient of interest as it captures the change in probability of a patient receiving OMT in the experiment group clinics during the experiment phase. A positive coefficient indicates that patients are more likely to be treated with OMT in the two clinics in the experiment group as compared to the control group clinics during the time period the posters were displayed.

RESULTS

Data before and after poster placement were compared and probit regression analysis was performed. Before poster placement, 9,171 patients were seen in the control group offices (offices without posters), with 88 patients having been treated with OMT. In comparison, 9,381 patients were seen in the experimental group offices (offices with posters), with 335 patients having been treated with OMT. In the period during poster placement, 7,682 patients were seen in the control group offices, with 58 patients having been treated with OMT, while 8,384 patients were seen in the experimental group offices with 374 patients having been treated with OMT. Table 1 summarizes the demographics of the patients treated with OMT in all offices during the timeframe of the study as well as the patient population of the practice. A majority of patients who received OMT in both groups were Caucasian females with an average age of 48 to 49 years old. Race, gender and age range of patients were comparable in both groups.

TABLE 1:

Descriptive statistics (mean values) of the patients treated with OMT in all offices during the timeframe of the study as well as the patient population of the practice.

	TOTAL PATIENT POPULATION	OMT PATIENTS	EXPERIMENT PHASE	PRE-EXPERIMENT PHASE
Observations	34,618	855	432	423
Female	63.7%	74.2%	73.3%	75.4%
Male	36.3%	25.7%	26.6%	25.1%
Asian	2.1%	1.9%	1.9%	1.9%
Black/African American	20.1%	10.1%	7.6%	12.7%
Native American/Alaskan Native	0.2%	0.2%	0%	0.5%
Native Hawaiian/Pacific Islander	0.2%	0.1%	0.2%	0%
Other	1.9%	1.4%	3%	2.6%
White	65.1%	76.6%	78.4%	74.5%
Age (years)	58.18	48.79	48.9	48.6

The data shows a positive correlation for those receiving OMT who were exposed to the posters, as compared to those who were not exposed such that there was an increase in OMT performed in the offices with posters advertising OMT during the intervention period. Table 2 shows the probit regression analysis for the intervention period.

TABLE 2:

Probit regression analysis for the intervention period

VARIABLES	PROBIT REGRESSION (1)	MARGINAL EFFECTS (2)
Intervention period	0.267** (0.104)	0.0653** (0.025)
Gender	-0.311** (0.127)	-0.070** (0.026)
White	-0.446** (0.183)	-0.096** (0.034)
Black	-0.689*** (0.227)	-0.210*** (0.080)
Age	-0.00173 (0.00364)	-.0004 (0.00089)
Constant	1.581*** (0.269)	
Observations	854	854

Robust standard errors in parentheses

***p<0.01, **p<0.05, *p<0.1

Control group: patients seen in office without posters advertising OMT

Experiment group: patients seen in offices with posters advertising OMT

Intervention: Posters placed in the offices designated in the experimental group

Column 2 of Table 2 gives us the marginal effects of a probit regression that analyzes the effect of the intervention on the experimental group. Interestingly, we see that the probability of patients seeking OMT treatment in the experimental group increased by 6.5% during the intervention period. There are several interesting demographic results, as well. We see that the two major racial groups, White and Black, are less likely to use OMT techniques compared to patients from other racial categories such as Asians and Native Americans in the experimental group. Age doesn't seem to have an impact on the number of patients seeking OMT treatment.

The data would indicate that point-of-care posters can potentially increase the use of OMT in the primary care office setting.

DISCUSSION

As illustrated by this study, OMT utilization can potentially increase with the implementation of point-of-care reminders. While there are various perceived barriers to OMT from some physicians' perspectives, a simple poster in the exam room may lead to the introduction of OMT into the care of some patients.⁶

It should be noted this study did not delineate how many of the patients' visits were follow-up OMT visits, as opposed to initial visits. Although the impact of the posters may have been overestimated due to this deficiency in delineation, the actual number of OMT procedures may have also been underestimated due to the fact that there could have been some variability in OMT billing practices, especially with residents in the offices. Another limitation of this study is the baseline difference in the number of OMT procedures performed between the two groups. While the total number of

patient encounters was similar, there was a contrast between the number of OMT procedures performed at baseline, which would indicate fewer physicians performing OMT at those control group offices.

Moving forward, studies should explore whether the utilization of OMT differs at various stages of medical training as it would be interesting to investigate whether there are differences in OMT usage among residents and attending physicians. Finally, continued exploration of point-of-care reminders and further examination of their impact both for patients and osteopathic physicians would be both interesting and helpful to improve practice and patient care.

CONCLUSION

This research shows that placing OMT posters in select family medicine offices resulted in an increase in OMT use. This observed increase may be explained by the patient's increased awareness of the benefits of OMT and/or the posters simply reminding osteopathic physicians of the benefits of OMT. Whatever the cause, the outcome of increased OMT usage has the potential to improve patient care in osteopathic practice. Moreover, these findings may be particularly useful in combating the current health emergency we are experiencing in the opioid crisis. Studies have shown that a comprehensive approach to chronic pain treatment should be taken, including nonpharmacologic modalities.¹⁴ Expanded use and awareness of OMT has the potential to decrease pain medication prescriptions and increase functionality through conservative measures.

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AUTHOR DISCLOSURES:

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REVIEW ARTICLE

OBSESSIVE-COMPULSIVE DISORDER: DIAGNOSIS AND MANAGEMENT WITH AN OSTEOPATHIC COMPONENT

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KEYWORDS:

Biopsychosocial Model
 Obsessive-Compulsive Disorder
 Osteopathic Manipulative Treatment
 Osteopathic Tenets
 Pharmacotherapy

ABSTRACT:

Obsessive-compulsive disorder (OCD) is a debilitating neuropsychiatric disorder that affects about one in 40 American adults and one in 100 American children. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), the patient must have the presence of obsessions, compulsions or both. OCD can be covert in presentation and therefore requires physician vigilance with the diagnosis. The efficacy of the physician's interviewing style is extremely important in OCD treatment because typically, long delays in diagnosis often occur and the shame associated with the disorder may inhibit discussion of the symptoms and treatment plans. In addition to serotonin-regulating medications, deciphering the etiology of the patient's obsessions or compulsions is important. Thus, cognitive behavioral therapy supplemented with SSRIs is the true first-line therapy for OCD because it provides a synergistic approach of life discussions, habit training and medication.

Because of the inseparability of physical and mental health, osteopathic medicine offers an effective model for treatment through osteopathic manipulative treatment (OMT). In the holistic view of OMT, somatic, visceral and psychological dysfunctions are united. Thus, physicians who incorporate OMT into their practice can aid in the treatment of psychopathology, such as OCD.

In this article, we will discuss the epidemiology of OCD, the DSM-5 criteria for OCD, the current OCD treatments, the osteopathic approach and how it pertains to OCD treatment, and lastly, OMT and its possible role in treating OCD. Due to a lack of research on osteopathic manipulative medicine (OMM) treatments in OCD, we will also propose a possible study design for further investigation.

INTRODUCTION

In the United States, about one in 40 adults and one in 100 children have OCD.¹ Moreover, according to the World Health Organization, OCD is one of the top 20 causes of illness-related disability worldwide for individuals between 15 and 44 years of age.¹ Males make up the majority of very early onset cases, with nearly a quarter occurring before age 10. In contrast, females have a much more rapid accumulation of new cases after 10 years of age, with the steepest increase in adolescence. Additionally, there are few new onsets among males or females after the early 30s.^{2,3}

It is also noteworthy that OCD commonly presents with other co-occurring psychiatric disorders, the most common being:

- Panic disorder, social anxiety disorder, generalized anxiety disorder or a specific phobia (76%)²
- Mood disorders—usually major depressive disorder (63%)²
- Tic disorder (up to 29% lifetime history)⁴

OCD is much more common in individuals with certain other disorders, such as among individuals with schizophrenia or schizoaffective disorder (approximately 12%), bipolar disorder, eating disorders (e.g., anorexia nervosa and bulimia nervosa) or even trichotillomania (hair-pulling disorder).⁵⁻⁷ When these other disorders are diagnosed, the patient should simultaneously be assessed for OCD as well.

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DIAGNOSTIC CRITERIA

According to the DSM-5 diagnostic criteria for obsessive-compulsive disorder, the patient must have the presence of obsessions, compulsions or both.⁸

The following two principles define obsessions:

1. Recurrent and persistent thoughts, urges and impulses that are experienced, at some time during the disturbance, as intrusive and unwanted, and that cause the person significant distress.⁸
2. The individual attempts to ignore or suppress such thoughts, urges or images, or to neutralize them with some other thought or action (e.g., by performing a compulsion).⁸

Compulsions are defined by the following two principles:

1. Repetitive behaviors (e.g., hand washing) or mental acts that the individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly.⁸
2. The behaviors or mental acts are aimed at preventing or reducing anxiety, distress, or some dreaded event or situation. However, these behaviors or mental acts are not connected in a realistic way with what they are designed to neutralize or are clearly excessive.⁸

It is important to add that the obsessions or compulsions are time-consuming (generally more than one hour per day). Because of this, they cause clinically significant distress or impairment in social, occupational or other important areas of functioning.⁸

If a patient's obsessive-compulsive symptoms are attributable to a physiological effect of a substance (e.g., drugs of abuse, a medication) or another medical condition, it can NOT be labeled as OCD.⁸

Lastly, it is important to know that OCD is a diagnosis of exclusion. Thus, the disturbances cannot be better explained by the symptoms of another mental disorder such as excessive worries (generalized anxiety disorder) or preoccupation with appearance (body dysmorphic disorder).⁸ Given the overlap of some symptoms, a practitioner should always entertain a differential diagnosis, including both psychiatric as well as medical disorders.

Now that we have set a framework for OCD, we will discuss the current therapies utilized to treat OCD, what it means to use an osteopathic approach (through both the tenets as well as the five models of osteopathic medicine) and how it pertains to the treatment of OCD, and lastly, OMT and its possible role in treating OCD. Because there is a lack of research delving into OMT's role in OCD treatment, we will propose a possible study design as well.

DISCUSSION

Pharmacotherapy Treatment of OCD

Clomipramine, the tricyclic antidepressant that is the most specific inhibitor of serotonin reuptake, was first shown to be efficacious in the treatment of obsessive-compulsive symptoms in uncontrolled trials in the 1960s.⁹ Controlled trials later clearly established the efficacy of clomipramine.^{10,11}

The introduction of selective serotonin reuptake inhibitors (SSRIs) in the 1980s represented the next important pharmacotherapeutic advance in the treatment of OCD. Beginning with the demonstration that fluvoxamine (an SSRI) can reduce symptoms in a substantial fraction of patients^{12,13} and is superior to tricyclic antidepressants other than clomipramine,¹⁴ numerous studies have shown that SSRIs are effective pharmacotherapy for many patients. Because of their more benign side effect profile, SSRIs are now considered first-line pharmacotherapy for OCD. However, clomipramine continues to be used widely but generally is reserved for monotherapy after SSRI trial failures.

The use of SSRIs and clomipramine in the treatment of OCD differs from the treatment of depression and other anxiety disorders in two important ways. First, higher doses of serotonin reuptake inhibitor medications are typically required before clinical improvement is seen. Second, improvement in OCD tends to be gradual, and an adequate medication trial is at least 10–12 weeks in duration and thus, may take quite a while to obtain results.¹⁵

There are also several other pharmacologic augmentation strategies for treatment-resistant OCD whose efficacy has not yet been clearly demonstrated. In particular, specific agents with adequate safety profiles and preliminary evidence of OCD symptom reduction include ketamine,¹⁶ riluzole,¹⁷ N-acetylcysteine,¹⁸ memantine,¹⁹ lamotrigine,²⁰ celecoxib²¹ and ondansetron.²² There is also interest in using nutritional products such as glycine or milk thistle,²³ although there is insufficient evidence to support the routine use of these agents in treating OCD.

Benzodiazepines are effective for the short-term treatment of anxiety disorders,²⁴ but have limited efficacy in OCD. Clinical trials have not demonstrated a benefit of concomitant benzodiazepine and SSRI pharmacotherapy specifically for OCD and current evidence does not support long-term benefits for improving OCD symptoms.²⁵ Benzodiazepines are commonly used early on to acutely control distressing anxiety and insomnia before the benefits of SSRIs or cognitive behavioral therapy (CBT) take effect.²⁶ However, given the significant risk of physiologic dependence and lack of clear long-term benefit, benzodiazepines should be used with restraint, monitored very closely and for a limited duration in OCD patients.

Lastly, there have been developments in using deep-brain stimulation (DBS), which was initially piloted for the relief of movement disorders such as those found in Parkinson's Disease and now includes neuropsychiatric disorders. This procedure involves the surgical implantation of electrodes and the introduction of targeted electrical stimulation to specific brain regions. In OCD, that target currently is the anterior limb of the internal capsule/nucleus accumbens or the thalamus/subthalamic nucleus.²⁷ Crossover trials comparing OCD symptomatology and severity when the implanted electrodes are turned on compared with when they off demonstrate significant efficacy (>35% reduction in symptom severity) of DBS for both brain regions.²⁷ Recent studies have further refined the brain regions of interest, improving treatment outcomes.²⁸

Osteopathic Approach

Osteopathic medicine was founded in 1874 by Andrew Taylor Still, MD, DO. Central to his philosophy and creation of osteopathic medicine, the goal of OMT is to provide patients with the tools they need to restore and maintain their natural, self-healing state.

The four major tenets of the osteopathic medicine are:³⁰

1. *The body is completely united; moreover, the person is a fully integrated being of body, mind and spirit.* Because of this, any alterations in any part of the system, including an individual's mental and spiritual health, affect the function of the body as a whole.^{29,30}
2. *The body is capable of self-regulation, self-healing and health maintenance.* Health is the natural state of the body, and the body possesses self-regulatory mechanisms that it uses to heal itself from injury. OMT's function is to restore the body's self-healing ability.^{29,30}
3. *Structure and function are reciprocally related.* The structure of a body part governs its function, and thus abnormal structure manifests as dysfunction. The function also governs structure. In addition, if the body's overall structure is suboptimal, its functioning and capacity for self-healing will be inhibited as well.^{29,30}
4. *Rational treatment is based on an understanding of these three principles.* These basic osteopathic tenets permeate all aspects of health maintenance and disease prevention and treatment. The osteopathic physician examines, diagnoses and treats patients according to these principles.^{29,30}

Along with these tenets there are five main models to which osteopathic physicians adhere:

1. Respiratory-Circulatory
2. Neurologic
3. Biomechanical
4. Metabolic-Nutritional
5. Biopsychosocial

The model discussed most often with regards to the treatment of OCD is the Biopsychosocial Model. This model addresses the psychological and social components of a patient's health, as stress is a well-known contributor to illness. Treatment goals include optimizing the psychological and social components of a patient's health. Irritability, tension, anxiety, difficulty concentrating, diminished interest, feeling overwhelmed and sleep disturbances are all common in those suffering from mental dysfunction—including OCD.^{31,32} It is important to note that stress and how OCD patients handle their condition will affect all five models, but we will focus our next discussion on treating OCD using the Biopsychosocial Model.

Treating OCD Using the Biopsychosocial Model

The application of the Biopsychosocial Model is knowledge-based and skill-based. In this model, the physician is trained to acquire knowledge and learn interviewing skills that allow the physician to inquire about other potential influences (e.g., psychological, social and environmental) that may impact the understanding and treatment of the disordered state. The skill and effectiveness of the physician's interviewing style allows for a unique partnership to be established between physician and patient. This relationship is extremely important in OCD treatment because typically long delays in diagnosis often occur and the shame associated with the disorder may inhibit people from mentioning the symptoms.³³

OCD is a neurologically-based illness with emotional, mental and behavioral symptoms. As OCD is often covert in presentation, diagnosis requires more vigilance than other common psychiatric disorders. It is because a person suffering from OCD may feel a sense of shame or embarrassment and their symptoms may go un- or under-reported. Thus, primary care physicians can greatly benefit their patients by screening more actively for this disorder. Once the correct diagnosis is made, education and treatment interventions can greatly enhance the quality of life for individuals with OCD.³⁴

With regards to screening, The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) is considered the gold standard assessment tool for OCD symptom severity and possesses good psychometric properties.³⁵ The Y-BOCS has good internal consistency, interrater reliability and test-retest reliability over two weeks.³⁶ Additionally, the Y-BOCS demonstrates good convergent validity with clinician-rated measures of OCD impairment and self-reported obsessive-compulsive symptoms.³⁶ Furthermore, the Y-BOCS score has demonstrated sensitivity to both pharmacologic and evidence-based psychotherapy treatments.³⁷

More attention should be placed on health promotion and disease prevention by providing adequate time to educate patients about their diseases, including symptomatology and manifestations, treatment plan, and the assurance of the physician's assistance. This proactive approach leads to a healthier lifestyle for the patient but demands more time from the physician.^{38,39} Also, an essential component of treatment for OCD is to reassure the patient that they have a disorder and that they are not "at fault" for these behaviors.³⁴ After all, negative self-appraisals of intrusive thoughts are the most central symptoms in OCD and they uniquely predict co-occurring symptoms of anxiety and depression, suggesting that these symptoms should be prioritized in theory and treatment of OCD.⁴⁰

The patient may have other influences contributing to the disordered state. A major part of the Biopsychosocial Model is placing more attention on nonorganic factors, such as psychological, social and spiritual factors. Moreover, with OCD, one must dedicate ample time to determining life stressors and evaluating as many social risk factors as possible.^{40,41} This is especially important with mental health disorders such as OCD because the effects of different stressors must be thoroughly assessed and considered.⁴¹ If these other factors are not accounted for, then the treatment plan may fail.

In OCD one cannot solely rely on medications, but also must spend time deciphering what drives the patient’s obsessions or compulsions. This is because often, OCD symptoms are exacerbated by psychosocial stressors, which may serve as a modifiable aspect of treatment.⁴¹ Thus, CBT and, if needed, SSRIs, in combination are the true first-line therapy for OCD because it provides a synergistic approach of medication, life discussions and habit training.⁴²

The Role of Osteopathic Manipulative Treatment in Treating OCD

Because of the inseparability of physical and mental health, osteopathic medicine offers an effective method for treatment of these issues through OMT.

The diagnosis and treatment of somatic dysfunctions provide the practitioner with a system of clinical problem-solving that provides an opportunity to approach the patient holistically. At every level of the central nervous system, the neurophysiology of somatic dysfunction inseparably links viscera, soma and psyche through complex viscerosomatic, somato-visceral, somato-psychological and psycho-somatic feedback relationships. One component of these complex relations cannot become problematic without impacting the others, and treatment of any one aspect is not complete without consideration of the others.⁴³⁻⁴⁵

The term *psycho-somatic* refers to the interaction between the psyche (mind) and the soma (body). More properly referred to as “psychophysiological disorders,” this group of disorders presents primarily as physical conditions that are affected by emotional factors (OCD included). They typically involve a single organ system and are usually associated with increased activity of the autonomic nervous system.^{45,46}

The psycho-somatic pathway can be explained neurophysiologically through segmental facilitation. This is found in association with spinal somatic dysfunction. Many psychological conditions cause increased cortical activity, which focuses on neurological impulses to specific spinal levels, causing dysfunction.^{43,44} This produces segmental hypersensitivity to nociceptive stimuli, which in turn results in increased cortical awareness of structures, somatic and/or visceral, innervated by the facilitated segment.⁴⁴ It also explains of how emotional distress (from OCD), acting through descending pathways, can be directed by the facilitated segment to result in gastrointestinal hypermotility or bronchospasm.^{43,44,47}

The converse, a somato-psychological pathway, is shown when an individual experiences physical discomfort, along with an accompanying psychological response. Pain is transmitted to the central nervous system by nociceptive neurons. This results in segmental facilitation, and impulses continue up the spinal cord, through the limbic system, where emotional associations can be made, eventually reaching cortical awareness.⁴⁷

OMT has also been recommended to reduce stress-related musculoskeletal tension and sympathetic hyperactivity found in association with most psychiatric illnesses, including schizophrenia,⁴⁸ depression,^{49,50} anxiety (including OCD)^{49,50} and somatoform disorders.^{49,50} It is important to point out that OMT

has been recommended as an appropriate procedure for all age groups, including children and the elderly.⁵⁰

Osteopathic medicine has always considered the integration of psyche and soma, just as it has soma and viscera, as part of its theory and practice. Thus, physicians who incorporate OMT into their practice will be able to aid in treating patients with psychopathology (including OCD) as somatic, visceral and psychological dysfunctions are inseparable.⁴⁵

Osteopathic Manipulative Treatment Protocol in Treating OCD

There are currently no studies done on the effectiveness of an OMT protocol for treating OCD. However, there is literature showing the effectiveness of OMT as a treatment for anxiety.⁵¹⁻⁵² It should be noted that there is a debate about whether OCD is appropriately classified as an anxiety disorder or if OCD deserves its own category of disorder. However, according to the American Psychiatric Association, OCD is still considered an anxiety disorder.⁵³ Whether or not OCD has distinct neurobiology has yet to be fully proven; but it is highly responsive to psychological treatments that involve cognitive and behavioral modification of anxiety symptoms and thus, it is typically considered an anxiety disorder.³³

First, in OMT, the physician will inspect the area of interest. Second, the physician will palpate certain areas of interest to test for somatic dysfunction and restriction⁵⁴ that are seen in Table 1.

TABLE 1.

Areas of interest to test for somatic dysfunction in the OCD patient

CRANIAL	DIAPHRAGMS	JUNCTIONS
<ul style="list-style-type: none"> • Vault • Face TMJ 	<ul style="list-style-type: none"> • Tentorium Cerebelli • Thoracic Outlet • Respiratory • Pelvic 	<ul style="list-style-type: none"> • Occipito-Atlantal (OA) • Cervical-Thoracic • Thoracic-Lumbar • Lumbar-Sacral
OA Joint	Autonomic Connections	Cervical and Thoracic Spine
Core Link between Sacrum and Occiput	Hyoid Bone	Ribs

After diagnosing the patient, OMT techniques are performed to address the dysfunctions. The top four techniques (denoted with an asterisk *) in Table 2 should be performed on every OCD patient.⁵⁴ These techniques are considered to be the “high yield” techniques for anxiety disorders. Other suggested techniques that are used in anxiety disorder treatments are listed in Table 2.⁵¹ It is important to be aware that for all of these techniques, the contraindications are all the same—avoid using the techniques if there is acute regional pathology.

The sample protocol outlined here is a combination of OMT techniques used for anxiety disorders as well as how to perform them. Clinical pearl: it is imperative that the physician allows the somatic dysfunctions to guide the treatment and not the converse.

TABLE 2.

OMT techniques to use when treating the OCD patient

TECHNIQUE	BASIC STEPS
OA Articulatory*	Stabilize the atlantoaxial joint (AA) joint such that it is not being affected in this treatment. Position hands to be able to feel the OA junction and then mobilize OA gently to free it.
Hyoid Evaluation and Treatment*	Stabilize hyoid bone and gently, rhythmically move it back and forth until the release of the fascial restrictions nearby.
TMJ: Fascial Unwinding*	Stabilize the outside of the jaw and place thumbs inside of the mouth. Keep thumbs near the molar teeth and grasp them firmly, but not too tightly as to introduce an extra vector. Allow jaw to glide into its freedoms and follow it throughout.
Costo-Chondro-Sternal Release*	Patient is supine. The physician places one hand on the sternum and the cervical-thoracic (C-T) junction. Assess the patient's freedoms in the three cardinal planes by moving the anterior or top hand in the following directions: superior/inferior, left/right and clockwise/counterclockwise. Next, place the top hand in a position such that it engages all three freedoms ("stack the freedoms") and the lower hand on the C-T junction should be doing the opposite motions — hold until a release is felt.
Sub-occipital Release	Patient is supine. The physician places fingers in the patient's suboccipital area. Apply gentle lateral and superior traction by pushing elbows together and tractioning superiorly.
Spencer's Technique	Patient is in a lateral recumbent position so that one shoulder is facing up at a time while stabilizing the scapula. Each step is repeated seven times. Step 1 (Extension): Take shoulder and extend (elbow bent) to the end of the range of motion (ROM). Step 2 (Flexion): Flex elbow straight to the end of the ROM. Step 3 (Circumduction): With elbow bent, start with small circles and gradually get bigger going clockwise, then repeat going counterclockwise. Step 4 (Circumduction with traction): With elbow straight up to the ceiling, start with small circles and get gradually bigger going clockwise; then repeat going counterclockwise. Step 5 (Abduction): Bend elbow and patient holds the physician's forearm creating a fulcrum — then abduct into the barrier. Step 6 (Adduction): Same hold as an abduction but adduct instead. Step 7 (Internal rotation): Have arm bent and behind the patient. Use the elbow as a fulcrum and gently pull towards the physician (anteriorly). Step 8 (Abduction with traction): Put the patient's hand on the physician's shoulder, hold the proximal upper extremity around the rotator cuff with both of the physicians' hands, lean back and gently stretch the scapula.
Cervical Spine Myofascial Release	Direct or Indirect Technique: palpate to make a good purchase of the patient's cervical fascia. Move the fascia into either the position of restriction or ease and hold until a release is felt.
Lumbar Spine Muscle Energy	Patient is supine and the physician brings lumbar spinal muscles to the edge of the restrictive barrier. Next, the patient is asked to move towards their direction of freedom while the physician applies an isometric force for 3–5 seconds. The patient relaxes for 3–5 seconds and then the patient is brought further into their restrictive barrier. Repeat three times and perform a passive stretch into the restrictive barrier at the end of treatment.
Sacral Muscle Energy	Patient is supine and the physician brings the sacrum to the edge of the restrictive barrier. Next, the patient is asked to move towards their direction of freedom while the physician applies an isometric force for 3–5 seconds. The patient relaxes for 3–5 seconds and the patient is brought further into their restrictive barrier. Repeat three times and perform a passive stretch into the restrictive barrier at the end of treatment.

*Denotes the four techniques that should be done on every OCD patient.

OMT EFFECTS ON OCD STUDY DESIGN

A possible cohort study looking at the effects of OMT on OCD may be conducted by dividing participants into three groups. One group is treated with SSRIs alone, another with SSRI and OMT and the last group with SSRI and a sham OMT (performed by a PhD/ non-healthcare professional or student). The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), as discussed previously, would be used to measure the patient's OCD severity scores at three different time points: pre-treatment, three months into treatment and six months into treatment. A repeated-measures ANOVA could be used to analyze statistical differences between the time points. The comparison of these results would give an interesting perspective regarding the treatment of OCD patients with OMT.

In addition, a qualitative component to our study design could be interjected by monitoring the participants for irritability, tension, anxiety, difficulty concentrating, diminished interest, feeling overwhelmed and sleep disturbances that they felt throughout the treatment course at those same three time points.

CONCLUSION

OCD is a chronic and severe psychiatric disorder that is often incapacitating when left untreated. Patients suffering from OCD often attempt to hide their symptoms due to the embarrassing or disturbing content of their thoughts. Many individuals isolate themselves because of their symptoms and avoid their exposure to potentially anxiety-provoking situations. Unfortunately, because of this, there is often a long delay between the time when an individual develops OCD symptoms and when they first obtain treatment.

Early diagnosis and treatment minimize symptom severity and level of disability. Thus, the better the connection that a physician and patient has, the more likely the patient will come in earlier with their concerns. Ultimately, if treated correctly, the more likely it is that the patient will have positive results. Lastly, it is crucial to note that OMT can have immense effects on the somato-visceral and somato-psychological pathways and should be considered as an aid in the treatment of OCD.

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AUTHOR DISCLOSURES

No relevant financial affiliations or conflicts of interest.

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REVIEW ARTICLE

OSTEOPATHIC MANIPULATIVE TREATMENTS FOR PEDIATRIC CONDITIONS

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ABSTRACT:

Osteopathic manipulative treatment (OMT) has been used in the treatment of pediatric patients for decades. The authors performed a systematic review to find evidence showing the safety and efficacy of OMT use in pediatric patients for common pediatric conditions seen in the outpatient setting. The conditions reviewed are otitis media and asthma, as they are the most common acute reason children under age five present to their physician and the most common chronic condition affecting children, respectively.^{1,2} The review found evidence of OMT being beneficial in the reduction of middle ear effusions following otitis media.³ The use of OMT was also shown to increase the peak expiratory flow of children with asthma.⁴ Very few studies have been performed to show the safety of osteopathic manipulative treatment; however one study showed that the incidence of iatrogenesis is minimal. Several easy-to-use techniques are demonstrated in the hopes that this will encourage more osteopathic physicians to incorporate the use of OMT into daily practice. As it stands, more studies are needed to give statistical significance and to prove that OMT is a safe, effective, non-invasive option for the treatment of various pediatric conditions.

INTRODUCTION

When reviewing the literature, there is a significant amount of information about the use of osteopathic manipulative treatment (OMT) in certain sectors of the pediatric population, particularly in newborns and preterm infants. There are also several resources filled with case-based and retrospective evidence for the use of OMT in the pediatric population from some of the pioneers in the field; Viola Frymann, DO and Beryle Arbuckle, DO. A couple of specific patient populations, those with cystic fibrosis and cerebral palsy, are represented in the literature concerning the use of OMT in disease treatment and management. However, the authors wanted to determine what research is available to show the safety and efficacy of using OMT as part of the treatment of common pediatric conditions in the outpatient setting and what common techniques can be used in the treatment of these patients.

METHODS

First, the authors determined the most common pediatric diagnoses made in the outpatient setting based on ICD-10 codes. A list of the 25 most used codes was narrowed to more specific diagnoses and to exclude encounters for routine health examination and vaccine administration. Several diagnoses were eliminated from the list because they were general and/or could be included in some of the other listed diagnoses. For example, streptococcal sore throat would be included with acute pharyngitis and acute upper respiratory infection, cough, fever, abdominal pain, viral infection and viral disease were felt to be too broad to be inclusive in this search. The remaining common diagnoses from the list were otitis media, acute pharyngitis, asthma, allergic rhinitis, sinusitis, dermatitis, ADHD, bronchitis, conjunctivitis, esophageal reflux, influenza, gastroenteritis/colitis, constipation and pneumonia.⁵ Once this list was determined, PubMed was searched for articles pertaining to the use of osteopathic manipulation in the pediatric population for each diagnosis, respectively. Only otitis media and asthma had relevant scholarly works that met these criteria and were sufficient enough to be included in this review.

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OTITIS MEDIA

Otitis media is reported to be the most common reason that children under the age of five visit the doctor other than for routine wellness examinations and vaccinations.¹ In the U.S. alone, it is estimated that pediatric visits for otitis media total more than 20 million per year.⁶ Estimates show that by two years of age, over 90% of children in the U.S. have had at least one episode of acute otitis media. In the year 2000, the U.S. estimated the economic costs associated with acute otitis media at greater than \$5 billion, with these costs not only coming from the rendering of health care itself but also the loss of revenue and productivity in terms of employment, as parents were required to stay home and care for ill children.³ The need to find effective treatments for acute otitis media and the prevention of recurrent infections stems from the fact that recurrent infections lead to the potential sequela of hearing loss, delays in language and behavior, barriers to education, and disorders in the vestibular system and motor function.⁶

With otitis media being the most common acute diagnosis in the pediatric patient, it was not surprising that this search yielded the most results for clinical research. The Degenhardt and Kuchera study⁶ noted that the use of OMT in treating children with acute otitis media appeared to be beneficial since 62% of their study participants did not have a recurrence of acute otitis media (AOM) at one year, but the small sample size (N=8) was not enough to claim effectiveness. Their study was also limited by the lack of a control group and the fact that the investigators did not use a specific treatment protocol and instead treated the somatic dysfunctions identified on any given day, making the reproduction of the results impossible. Their approach to treatment was the use of balanced membranous tension or osteopathic cranial manipulative medicine and myofascial release focusing on the head and face, neck, thorax, ribcage, lumbar region and pelvis.⁶

In a separate study, Steele *et al*³ conducted a prospective, randomized, blinded, controlled study using a standardized OMT protocol, in addition to standard of care, to determine the efficacy of such treatment on the resolution of the middle ear effusion following an AOM.³ Their standardized protocol consisted of nine techniques using the modalities of myofascial release, balanced ligamentous tension, and osteopathic cranial manipulation targeted at the head and neck, ribcage and diaphragm, the pelvis, and the thoracolumbar junction. The investigators gave specifics concerning patient positioning and physician hand placement, giving the better potential for reproducibility of the findings. While the number of patients enrolled in this study was still fairly low (N=43), they were able to show, with statistical significance ($p=0.02$), that the use of an OMT protocol can reduce the presence of middle ear effusion following acute otitis media and can prevent the need for surgical intervention.³

In the study by Steele *et al*³, the investigators mention that each treatment protocol lasted anywhere from 15–30 minutes, which might be effective in the research setting, but it is not efficient for use in acute, outpatient visits where patients are often scheduled every 10–15 minutes. Considering that eustachian tube dysfunction, because of its more horizontal positioning in

pediatric patients, plays a large role in the development of AOM, it may be more efficient to target this structure when incorporating the use of OMT in the outpatient clinic. Attention could also be given to the anterior cervical muscles and fascia and the thoracic inlet since this is the path of the lymphatics that drain the middle ear. Considering the lymphatic component in disease management, the rib cage and diaphragm would also be an easy target for treatment, as the diaphragm and thoracic cylinder act as a constant lymphatic pump.⁷

In 2009 the Osteopathic Cranial Academy published a position paper on the use of OMT for treatment of otitis media in which they concluded that antibiotic overprescribing and unnecessary surgical intervention are often seen in the treatment of otitis media, with little to no long-term benefit. They concluded that OMT should be the first-line treatment in the majority of cases of otitis media and should be used as part of the treatment protocol in all cases.⁸ Given that the other accepted treatments to prevent recurrence are prophylactic antibiotics or surgical interventions, OMT should be considered a safe and non-invasive method of preventing the long-term sequela associated with recurrent otitis media and chronic middle ear effusion.

ASTHMA

Asthma is the most common chronic condition affecting children.⁹ An estimated 6.1 million children have been diagnosed with asthma and annual health care costs associated with childhood asthma are estimated at \$56 billion. The prevalence of pediatric asthma ranges from 5–12% of the pediatric population in the U.S.² Asthma is one of the main causes of hospitalization in children under the age of five and the incidence has been increasing over the last few years.⁹ Asthma is generally a lifelong disease increasing the risk of chronic obstructive pulmonary disease later in life.

Even though asthma is a common condition encountered in the pediatric population, there is much less research on incorporating OMT into treatment protocols. In a randomized controlled trial conducted by Guiney *et al*⁴, they showed a statistically significant (95% confidence interval) increase in the peak expiratory flow of asthmatic patients treated with OMT versus sham treatment. Of note, this study was conducted on stable, established patients in an asthma clinic and did not include patients experiencing acute distress. At the onset of the study, the group hypothesized that the use of OMT could improve overall respiratory function by decreasing somatovisceral reflexes and maximizing the function of the rib cage and thorax. The techniques used in this study were listed as rib raising, myofascial release techniques and muscle energy for the rib cage with the authors citing Foundations for Osteopathic Medicine as a reference for the techniques used but giving no further details about the treatment protocol. The limitations of this study include a small sample size (N=140) and the fact that multiple physicians were performing the OMT, leading to possible variations in the delivery of the treatments.⁴ The literature also includes both a review article and clinic practice article that make a case for using OMT to treat asthma patients but neither of these gives any data or treatment specifics.^{10,11}

The musculoskeletal system plays a key role in respiratory function. While there are many pharmacologic agents proven to

treat asthma effectively, these medications do nothing to affect the musculoskeletal system. The use of OMT, as a safe and non-invasive treatment, could help to provide a comprehensive treatment protocol for pediatric asthma patients by addressing this musculoskeletal component.

SAFETY

Patient safety is always a concern when performing any type of procedure and OMT is no different. Parents are often apprehensive when it comes to treatments being performed on their children, so it would be helpful to be able to confidently, and with the backing of clinical evidence, reassure them that OMT is safe to use in the pediatric population. None of the clinical trials discussed thus far reported any adverse events experienced as a result of treatment, but with very small numbers in these trials, this may not prove safety.

To provide more evidence supporting the safe use of OMT in the pediatric population, Hayes and Bezilla¹² conducted a retrospective review of medical records to determine the incidence of iatrogenesis when OMT was performed on this population. They reviewed records looking for evidence of aggravations and complications. Aggravation was defined as patient complaints after treatment or a worsening of symptoms. Complication was defined as dislocation, fracture, sprain or strain, cerebrovascular accident, pneumothorax or death. Their review of 346 medical records showed zero documented complications and 31, or 9%, documented aggravations from treatment. Some of the common aggravations were soreness, pain, headache and irritability. Within 48 hours of the aggravation, seven of those 31 patients reported complete resolution of the aggravation symptoms. The investigators noted that some of these reported aggravations would be what osteopathic physicians know to be normal, post-treatment responses as the body adapts to structural changes. This study concluded that the incidence of iatrogenesis is minimal and the use of OMT in the pediatric population appears to be safe, with the caveat that more and larger studies need to be conducted to provide the best evidence to prove this conclusion.¹²

TREATMENT TECHNIQUES

The following techniques can be incorporated into office or acute settings to help treat patients with acute otitis media or asthma and are the authors' variations on the material presented in *Somatic Dysfunction in Osteopathic Family Medicine, 2nd Edition*, unless otherwise referenced.¹³ The techniques are not time-intensive and can be performed by osteopathic physicians who do not have an in-depth knowledge of osteopathic principles and practices as do those physicians who specialize in neuromuscular manipulative medicine. As with any case, if the patient fails to improve with these quick, targeted treatments, the authors would recommend a full osteopathic structural exam to identify somatic dysfunction, because it is not uncommon for the key lesion to be found elsewhere in the body.

Auricular Drainage

This is a lymphatic technique used to promote drainage of the middle ear by improving eustachian tube function. The physician

separates the third and fourth digits on the treating hand and places these around the ear. Apply slight pressure to stabilize the ear, and then begin to move the tissues in a clockwise direction, in a rhythmic fashion. Once at the six o'clock position, emphasize inferior and medial pressure to enhance the technique, before continuing the clockwise motion. This is a technique that could easily be taught to the patient or parent to continue at home.

FIGURE 1:

Auricular drainage



Galbreath Technique

This is another lymphatic technique used to aide in the decongestion of the middle ear and eustachian tube. The physician positions the treating hand over the angle of the mandible and uses the other hand to stabilize the head. Pressure is placed from the inferior aspect of the angle of the mandible to move this structure both medially and inferiorly effectively. Care must be taken not to put too much pressure or strain on the jaw itself to prevent inducing a dysfunction at the temporomandibular joint. This technique can also be taught to the patient or parent to continue at home.¹⁴

FIGURE 2:

Galbreath technique, supine



FIGURE 3:

Galbreath technique, seated



Thoracic Inlet Release

The thoracic inlet is a bony ring that is comprised of the first thoracic vertebra, the first ribs and the manubrium. The clavicle is also an important bony structure as it contacts the sternum and is a landmark for locating the first ribs anteriorly. The purpose of this technique is to loosen the fascial and soft tissue layers associated with the thoracic inlet, as they not only aide lymphatic drainage, but respiration as well. The physician uses both hands to contact the bony structures of the thoracic inlet and applies slight pressure. The physician then tests ease of movement of the fascial and soft tissues associated with the thoracic inlet in all planes of motion: flexion and extension, side-bending and rotation. The physician can choose to treat those tissues in either a direct or indirect manner. To treat the dysfunctions directly, the physician would induce motion in the directions that increase tension in the fascial and soft tissue structures. The opposite manner, inducing motion to decrease tension in the structures, would be an indirect treatment.

FIGURE 4:

Thoracic inlet release, supine

**FIGURE 5:**

Thoracic inlet release, seated



Respiratory Diaphragm Release

This technique can be used to ease any tension in the respiratory diaphragm and surrounding tissues and it will likely also affect the ligamentous structures at the costovertebral junctions of the lower rib cage. The physician places both hands on the lower rib cage, wrapping around to the axillary line. The thumbs are midline, at the distal end of the sternum, taking care not to put pressure on the xiphoid process. The physician tests ease of movement of the diaphragm muscle and surrounding tissues in all planes of motion: flexion and extension, side-bending and rotation. The physician then induces motion in those three planes for either a direct or indirect treatment and waits for the tissues to ease. The authors find that often a slight compressive force between the two hands will aide in this process.

FIGURE 6:

Respiratory diaphragm release, supine

**FIGURE 7:**

Respiratory diaphragm release, supine



Rib Raising

This technique not only induces motion into the costovertebral joints, but it also adds stimulus to the sympathetic chain ganglia located along the thoracic spine. The physician places the finger pads of both hands along with the thoracic paraspinal muscles and posterior rib angles. The physician then applies an anterior and lateral pressure, using their forearms as a long lever. This is held until tissue ease and is repeated until the entire length of the costovertebral junctions is treated bilaterally.

FIGURE 8:

Hand placement for rib raising



FIGURE 9:

Rib raising, supine



Any of these techniques can be performed with the patient seated or supine, depending on patient comfort and cooperation. The authors find that many toddler-aged children are less cooperative and often want to remain in the arms of a parent. With some creative positioning all of these techniques can be performed while a parent holds the child.

CONCLUSION

OMT could prove to be a safe, effective and non-invasive treatment option for many of the common problems seen in outpatient pediatrics. The small studies reviewed here show patient benefits when OMT is incorporated into treatment and the osteopathic community has numerous examples of case reports and anecdotal evidence showing benefit, but larger studies are needed to prove efficacy. This review also shows many areas of research opportunity for the osteopathic community, as the majority of the most common diagnoses encountered in pediatric outpatient visits could not be found anywhere in the literature

concerning studies showing the use of OMT in treatment and management of these patients. Osteopathic manipulative treatment is considered generally safe for use in the pediatric patient, but again, more studies are needed to give statistical proof to this statement. The osteopathic community must work diligently to produce quality research to prove that the use of OMT is a safe and effective adjunctive treatment for pediatric patients with a variety of presenting complaints and conditions.

AUTHOR DISCLOSURES:

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REVIEW ARTICLE

PRINCIPLES OF TRANSGENDER CARE FOR THE PRIMARY CARE PHYSICIAN

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KEYWORDS:

Gender Affirmation

Gender Dysphoria

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Hormones

Transgender

ABSTRACT: The term transgender includes people whose gender identity differs from their sex assigned at birth. People identified as male at birth but possess a female gender identity are called transwomen and people identified as female at birth but experience a male gender identity are called transmen. Transgender individuals may also identify outside the binary norm.

The prevalence of transgender people who seek medical treatment has dramatically increased in recent years. Transgender individuals have a higher prevalence of mental health problems, suicidality and premature mortality risk versus the general population. However, many transgender persons avoid medical care due to perceived stigma, in conjunction with transgender-specific knowledge deficits among health care providers.

Integral to understanding transgender health is the concept of gender dysphoria. This refers to the internal conflict individuals experience due to incongruence between their birth sex and their self-perceived gender. For these individuals, the inconsistency causes significant internal conflict, often to the point that it interferes with functioning.

To address gender dysphoria, many transgender people elect to transition to a gender role that is consistent with their gender identity. These individuals opt for medical and/or surgical interventions to do so. Medical therapy incorporates the use of cross-sex hormones to facilitate the acquisition of secondary sexual characteristics consistent with the individual's internalized identity. Many transgender people choose to undergo gender-confirming surgeries in conjunction with hormonal therapy.

Health care is transgender-affirming when it supports the patient's inherent identity. Educating providers about this population's unique needs can help reduce health disparities and promote respectful transgender care.

INTRODUCTION

Historically one's gender typically referred to the state of being male or female when considered in reference to societal and cultural norms. Our understanding of this is evolving, in the sense that gender is now seen as a continuum.¹ As described by Heise *et al.*, "Gender is not accurately captured by the traditional male and female dichotomy of sex. Instead, it is a complex social system that structures the life experience of all human beings."² Rather than a binary construct, "gender identity includes gradations of masculinity to femininity...as well as identification as neither essentially male nor female."³ It is not an issue of choice for the individual and

should not be regarded as one. Therefore, one's gender identity is a personal, internalized sense of being male, female or something else. A person's gender identity does not equate to one's sex or sexual orientation. One's sex is typically assigned at birth as either male or female, usually based on the appearance of internal and external genitalia. Sexual identity is equivalent to sexual attraction or sexual preference.

TRANSGENDER TERMINOLOGY

People who remain in the gender role they were assigned at birth are termed cisgender (CG). Transgender (TG) has been accepted as an umbrella term used to describe people with a wide range of gender identities, which are different from the sex assigned at birth. TG men, or transmen (TM), possess a male gender identity but were identified as females at birth. TG women, or transwomen (TW), have a female gender identity but were identified as males at birth. TG individuals may also identify outside the binary norm. Their identity can exist along a spectrum; they may be both male and female, neither male nor female, or somewhere in between. Appropriate

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terms for these nonbinary individuals include genderqueer or genderfluid, though TG terminology is evolving as gender diversity becomes more accepted. Being TG implies a gender incongruence and not a sexual preference. TG people can be heterosexual, homosexual or bisexual in their sexual orientation.⁴

EPIDEMIOLOGY

The estimated incidence worldwide of transgendered persons is 0.5–1.3% of birth-assigned males and 0.4–1.2% of birth-assigned females.⁵ A recent review estimates 150,000 youth and 1.4 million adults in the U.S. identify as TG.⁶ Other studies place the number closer to approximately 0.6% of the U.S. population or two million persons.⁷ However, the true prevalence of TG persons in the U.S. is unknown. Current estimates are extrapolations from state-based surveys; no similar nationwide studies have been performed. Statistically, the percentage of adults who identify as TG doubled from 2011 to 2016.⁷ This rise is likely a reflection of changing societal norms; as evidence of social acceptance of the LGBTQ population has increased, more transgender/nonbinary (TNB) people have been willing to question the gender they were assigned at birth.

Based on data from the 2015 U.S. Transgender Survey (USTS), approximately 33% of the nation's TG population identify as TW, 29% identify as TM and 35% describe themselves as TNB.⁸ Transgenderism appears to be more common among younger age groups. 42% of respondents to USTS were between the ages of 18–24.⁹ Per USTS data, 94% of respondents began to feel gender incongruence by the age of 20.⁹

HEALTH DISPARITIES

The prevalence of TG people who seek medical treatment has dramatically increased in recent years. Greater visibility and acceptance of TG individuals have likely resulted in more individuals desiring care. However, many physicians find themselves ill-equipped to manage their needs. A nationwide assessment of TG individuals found that while 60% had a primary care provider (PCP), only 43% had informed the PCP they were TG.¹⁰ Among USTS respondents, one-third (33%) of TG persons who had seen a health care provider reported having at least one negative experience including verbal harassment, refusal of treatment or the need to teach the provider about TG people to receive appropriate care.⁸ To avoid discrimination, many TG patients prefer not to disclose their gender identity or opt for selective disclosure based on their perception of the provider's attitude, the setting or their medical needs.¹¹ Not uncommonly, TG individuals are forced to choose between accessing care according to their birth sex or forgoing services entirely.¹¹ Ultimately, real or perceived stigma in conjunction with knowledge deficits among health providers impacts TG peoples' ability to receive appropriate care.

Numerous factors contribute to the TG population's poor health outcomes. They are more likely to smoke (30%), misuse alcohol and drugs (26%) and be infected with HIV (20% in TG women). Mortality among TG persons is significantly higher than the general population.¹² Suicide, HIV/AIDS, liver failure and cardiovascular disease directly impact this heightened mortality risk.¹² Poorer

health outcomes are partially caused, and further compounded by, socioeconomic inequities, including higher rates of unemployment, poverty, legal discrimination and harassment, when compared with CG people.¹³

MENTAL ILLNESS

TG patients typically have high rates of mental health diagnoses (depression: 41%, anxiety: 33.2%).¹⁴ Among USTS respondents, 39% had experienced serious psychological distress in the month before completing the survey, compared with only 5% of the U.S. population.⁸ 82% of respondents had thought about killing themselves at some point in their lives; 40% had attempted suicide, nearly nine times the U.S. population rate.⁸ The data among TG youth is even more striking, with 54% having attempted suicide, the highest rates occurring in TM and nonbinary adolescents.¹⁵ Transgender adolescents may choose to hide their identity due to social or family rejection. However, the propensity towards suicidal behavior in these subgroups is not entirely well understood. It is important to recognize that this prevalence of mental health distress is not inherent to having a TG identity, but rather it is a response to adverse external factors, such as stigma and rejection, alongside discomfort with one's body.¹⁶

GENDER DYSPHORIA

Integral to the understanding of TG health is the concept of gender dysphoria (GD). Gender dysphoria refers to the suffering due to incongruence between one's sex assigned at birth and one's self-perceived gender.¹⁷ For GD individuals, inconsistencies between one's biological sex and gender identity cause significant internal conflict, often to the point that it interferes with functioning. Gender dysphoria is manifested in a variety of ways, including strong desires to be treated as the other gender or to be rid of one's sex characteristics, or a strong conviction that one has feelings and reactions typical of the other gender.¹⁸ Feelings of GD most often present before puberty and typically intensify during adolescence with the development of secondary sexual characteristics.

With the release of *The Diagnostic and Statistics Manual of Mental Disorders, Version Five (DSM-5)*, the diagnosis gender dysphoria replaced the diagnosis of gender identity disorder found in prior DSM versions.¹⁹ This change was made to remove the stigma associated with the term "disorder." TG individuals are not inherently disordered. Replacing disorder with dysphoria de-pathologizes the TG identity and focuses instead on dysphoria as the clinical problem. DSM-5 has identified criteria necessary to make a diagnosis of GD. These are listed in Table 1. In keeping with the change in DSM-5, the World Health Organization (WHO) recently adopted new guidelines that no longer describe gender nonconformity as a mental disorder. International Classification of Diseases 11th revision (ICD-11) has redefined gender-identity related health by replacing the prior ICD-10 term of gender identity disorder with gender incongruence and moved the diagnosis from the chapter on Mental and Behavioral Disorders to the one on Conditions Related to Sexual Health.²⁰

TABLE 1:

DSM-5 Criteria for gender dysphoria in adolescents and adults from *Diagnostic and Statistical Manual of Mental Disorders*

I. A marked incongruence between one's experienced/expressed gender and natal gender of at least six months in duration, as manifested by at least two of the following:
1. A marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics (or in young adolescents, the anticipated secondary sex characteristics)
2. A strong desire to be rid of one's primary and/or secondary sex characteristics because of a marked incongruence with one's experienced/expressed gender (or in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics)
3. A strong desire for the primary and/or secondary sex characteristics of the other gender
4. A strong desire to be of the other gender (or some alternative gender different from one's designated gender)
5. A strong desire to be treated as the other gender (or some alternative gender different from one's designated gender)
6. A strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's designated gender)
II. The condition is associated with clinically significant distress or impairment in social, occupational or other important areas of functioning.

TRANSITIONING

Because of a pervasive sense of cultural or societal stigmatization, in conjunction with identity-related incongruence, many TG people choose to transition to a gender role that is concordant to their gender identity. Typically, these individuals make a transition from one gender to the binary opposite. The first stage of transition often entails the adoption of gender expression (i.e., physical and behavioral manifestations) that conform to one's preferred identity. Typically, this is accompanied by a social transition to affirm their desired identity. This includes adopting a chosen name, identifying one's preferred gender pronouns and utilizing non-medical approaches to confirm one's gender expression. Often TG individuals in social transition use this time to "come out" to family, friends and coworkers.

TG people may seek any number of non-medical gender-affirming interventions as part of their transition. These include cosmetic approaches such as laser hair removal, gender congruent speech training, and behavioral interventions such as genital tucking or chest binding. It is important to note that not all TG persons choose gender-affirming treatment. This decision does not make them any more or less transgender.

HORMONAL THERAPY

Many TG individuals opt for medical and/or surgical interventions. The primary medical approach sought by TG people is the use of gender affirming hormone therapy (GAHT).²¹ GAHT incorporates the use of feminizing and masculinizing hormones to enable the acquisition of secondary sexual characteristics consistent with an individual's gender identity. GAHT is a medically necessary intervention²² for many TG individuals with gender dysphoria. Its use is associated with a significantly higher quality of life, greater self-esteem, better mood and reduction in psychological distress.¹² Hormone therapy can be started before an individual's complete social transition and may facilitate the process. It is well-documented that provision of GAHT has been shown to improve (one's) quality of life and reduce mood disorders such as anxiety and depression.²³

The World Professional Association of Transgender Health (WPATH) is an international, multidisciplinary, professional association that promotes evidence-based safe and effective care for TG individuals. WPATH has established standards of care for individuals wishing to start GAHT. These state that any person wishing to initiate hormone therapy must present with persistent, well-documented gender dysphoria; must demonstrate the capacity to make a fully informed decision and to consent for treatment, and must be the legal age of adulthood in the country of treatment.⁴ Additionally, if substantial medical or mental health concerns are present, they must be reasonably well-controlled.⁴

Historically, TG persons wanting to start GAHT required a mental health clearance to do so. The most recent WPATH guidelines (Standards of Care, 7th Version) validate an informed consent model as an alternative.⁴ Now, medical providers who feel comfortable making an assessment and diagnosis of gender dysphoria, as well as assessing for the capacity to provide informed consent...are able to initiate gender-affirming hormone therapy.²⁴ However, medical providers should still consider utilizing health care professionals with training in TG health to assure individuals have the support necessary to transition successfully. Current WPATH guidelines focus primarily on TG individuals with binary identities, i.e., TM and TW. Similar tenets of initiation and management of hormonal therapy apply to people with nonbinary identities, with a focus on prescribing them in an individualized manner, while maintaining accepted safe parameters of use.

BEFORE TREATMENT: INFORMED CONSENT

Hormone therapy should be provided only to those who are legally able to provide informed consent.²² Screening for and addressing acute or current mental or physical health concerns that may be exacerbated by GAHT is a required component of the informed consent procedure.⁴ Additionally, providers must ensure that patients understand the psychological and physical benefits, risks and potential psychosocial implications associated with GAHT. Patients should be informed that treatment with both feminizing and masculinizing hormones may lead to irreversible changes in gonadal function, leading to subfertility or infertility.²⁵ Patients interested in biologic parenthood should consider fertility preservation, i.e., egg or sperm banking. The risks associated with masculinizing and feminizing treatments are outlined in Table 2.

TABLE 2:
Risks associated with gender affirming hormone therapy

RISK LEVEL	FEMINIZING HORMONES	MASCULINIZING HORMONES
Likely increase risk	Venous thromboembolic disease Gallstones Elevated liver enzymes Weight gain Hypertriglyceridemia	Polycythemia Weight gain Acne Androgenic alopecia Sleep apnea
Likely increased risk with presence of additional risk factors	Cardiovascular disease	
Possible increased risk	Hypertension Hyperprolactinemia or prolactinoma	Destabilization of certain psychiatric disorders Cardiovascular disease Hypertension
		Type 2 Diabetes
No increased risk or inconclusive	Breast cancer	Loss of bone density Breast cancer Cervical cancer Ovarian cancer Uterine cancer

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PRIOR TO TREATMENT: HISTORY AND PHYSICAL

Before initiation of GAHT a detailed medical history must be obtained. This should focus on co-morbidities that may increase the risks identified in Table 2. Patients should be asked about psychiatric diagnoses, current suicidal ideation and psychiatric hospitalizations. Because of the enhanced risk of thromboembolic events and cardiovascular disease, patients should be counseled on tobacco cessation.

A complete physical exam should be performed, with a focus on conditions that might be aggravated with GAHT. However, because of potential prior negative experiences with health care providers, attention should be made to assure patients feel safe and empowered. The need for breast, genital and rectal exams are not required before the initiation of GAHT. They can be performed after rapport and trust have been established.

FEMINIZING HORMONE THERAPY

The core tenet of GAHT for TG adults is to establish a hormonal environment that is biologically concordant with the person’s gender identity. This is achieved by suppressing endogenous hormones and/or supplementing exogenous hormones consistent with the individual’s affirmed gender. In TW, feminization is accomplished with the use of estrogens and anti-androgens. Feminizing hormone regimens promote breast growth, softening of the skin, reduction

of androgenic hair loss, fat redistribution from the abdomen to the hips, a change in sweat and odor patterns, and reduced prostate and testicular size.^{21,23} Additional effects include a reduction in erectile function, changes in libido, and reductions in sperm count and volume of ejaculatory fluid.²¹ Most changes start within the first months of treatment; maximum benefit usually occurs after approximately three years of treatment. Feminizing regimens do not affect facial hair growth and do not change the voice.²³

Estrogen therapy usually involves the use of 17 β-estradiol administered either by oral, transdermal or intramuscular routes.²³ 17 β-estradiol is recommended rather than conjugated estrogens or ethinyl estradiol because it can be accurately measured in plasma and has a lower risk for thromboembolic disease.^{23,26,27} Absolute contraindications to the use of estrogenic therapy include previous venous thrombotic events related to an underlying hypercoagulable condition, history of estrogen-sensitive neoplasm and end-stage chronic liver disease.⁴

The anti-androgen used most frequently in the U.S. is the mineralocorticoid-receptor antagonist spironolactone. Spironolactone is a potassium-sparing diuretic, which in higher doses has direct anti-androgen receptor activity as well as a suppressive effect on testosterone synthesis.²⁸ The 5-α reductase inhibitors finasteride and dutasteride are an option for patients unable to tolerate, or with contraindications to the use of spironolactone. 5-α reductase inhibitors may also be an option for those patients who continue to exhibit virilized features or hair loss after complete androgen blockade.²¹

Progestagens such as micronized progesterone and medroxyprogesterone acetate are less frequently used feminizing agents. They have some anti-androgen effects via the central blockage of gonadotropins. The rationale for their use is anecdotal only. Some TW report improved breast and/or areolar development, mood and libido with these agents.²⁹ Table 3 lists feminizing hormone options and dosages.

TABLE 3:

Feminizing hormone regimens

HORMONE	INITIAL DOSE	MAXIMAL DOSE	COMMENTS
Estrogen			
Estradiol oral	2-4 mg/day	8 mg/day	If > 2 mg is necessary use BID dosing
Estradiol Transdermal	100 mcg	100-400 mcg	Max single patch availability is 100 mcg. Frequency of application is product dependent.
Estradiol Valerate IM	20 mg IM q 2 wk	40 mg IM q 2 wk	May divide to weekly dosing at patient preference due to cyclic symptoms
Estradiol Cypionate IM	2 mg IM q 2 wk	5 mg IM q 2 wk	May divide to weekly dosing at patient preference due to cyclic symptoms
Anti-androgens			
Spironolactone	50 mg/day - BID	200 mg BID	
Finasteride	1 mg/day	5 mg/day	
Dutasteride		0.5 mg/day	
Progestagens			
Medroxyprogesterone acetate (Provera)	2.5 mg qhs	5-20 mg qhs	

Deutsch M. Guidelines for The Primary and Gender-Affirming Care of Transgender and Gender Nonbinary People. San Francisco, CA: UCSF; 2016.

FEMINIZING HORMONE MONITORING

TW being treated with GAHT should be seen one month after initiation of therapy, then every three months for the first year. Subsequently, they can be seen every 6–12 months, assuming they are stable and have had no complications from treatment. Estrogen and testosterone levels should be measured at each visit, with the goal to achieve a serum estradiol level between 100–200 pg/ml and a testosterone level < 50 ng/ml.²⁶

Prolactin elevations related to the growth of pituitary adenomas have been reported with estrogen therapy. Therefore, some authorities suggest periodic monitoring of serum prolactin levels.¹ This is based on the case reports of prolactinomas in patients using older estrogen-cyproterone regimens. Findings from a recent study in patients treated with an estrogen-spironolactone regimen did not demonstrate prolactin elevations.³⁰ A consensus has not been reached on whether prolactin monitoring is necessary. However, it is currently recommended that prolactin levels be checked only in cases of visual disturbances, excessive galactorrhea and new-onset headaches.¹²

MASCULINIZING HORMONE THERAPY

In TM, masculinization is accomplished with testosterone supplementation. Testosterone is most frequently administered via either intramuscular or subcutaneous injection, though transdermal (via patch or gel) and nasal options exist. The effects of testosterone include changes in fat distribution, growth of facial hair, an increase in muscle mass and strength, deepening of the voice and cessation of menstruation.^{17,23} Additional effects include clitoromegaly, oily skin, acne, vaginal dryness, increased libido and androgenic hair loss.^{17,23} As with TW, changes typically begin within the first months of use and are maximized after several years of treatment. Table 4 lists testosterone prescription options and dosages.

TABLE 4:

Testosterone therapy

ANDROGEN	INITIAL	MAXIMUM	COMMENTS
Testosterone Cypionate	50 mg/wk IM/SC	100 mg/wk IM/SC	Q2wk dosing at double weekly dose
Testosterone Enanthate	50 mg/wk IM/SC	100 mg/wk IM/SC	Q2wk dosing at double weekly dose
Testosterone 1% topical gel	50 mg q am	100 mg q am	Available in either pump or packet
Testosterone 1.62% topical gel	40.5–60.75 mg q am	103.25 q am	Available in either pump or packet
Testosterone patch	4 mg q pm	8 mg q pm	Patches come in 2 mg, 4 mg sizes
Testosterone cream	50 mg	100 mg	
Testosterone 2% axillary gel	60 mg q am	90–120 mg q am	One pump = 30 mg

Deutsch M. *Guidelines for The Primary and Gender-Affirming Care of Transgender and Gender Nonbinary People*. San Francisco, CA: UCSF; 2016.

MASCULINIZING HORMONE MONITORING

In TM, the goal is to achieve a testosterone level in the usual male range of 400–700 ng/dl.¹ The frequency of lab monitoring is the same as per TW. However, serum hemoglobin and hematocrit (H&H) levels should also be measured regularly, as exogenous androgens may be associated with erythrocytosis.²¹ TM with physiologic male testosterone levels who are amenorrhoeic would be expected to have H&H values in the male normal range. TM with true polycythemia may require a reduction in their testosterone dose.²¹

CONTRACEPTION

While testosterone typically induces amenorrhea, it is not an effective means of contraception.²³ In one recent study, 20% of TM respondents who experienced pregnancy were amenorrhoeic on testosterone at the time of conception.³¹ Therefore, TM on testosterone needs counseling about contraception. Because testosterone is not a known contraindication to any form of contraception, transmen on testosterone should be offered all options³² including subdermal etonogestrel implants, depo medroxyprogesterone, and both hormonal and nonhormonal intrauterine devices.

GENDER CONFIRMING SURGERY

For many TG adults, gender-confirming surgery (GCS) is an essential and necessary step to alleviate their gender dysphoria and fully transition to their desired gender role.^{1,22} Accordingly, TG people often choose to undergo GCS in conjunction with hormonal therapy. Among USTS respondents, 25% reported having undergone some form of GCS.⁸

Generally, GCS falls into two main categories: those that directly affect fertility and those that do not.¹ GCS for TW that affect fertility include gonadectomy, penectomy and creation of a neovagina.¹ Surgeries that affect fertility in TM include oophorectomy, vaginectomy and complete hysterectomy.¹

TM may have external genital surgery as a component of GCS. Often this involves the creation of a neopenis, typically derived from a radial forearm flap.^{1,21} As an alternative, some TM choose a

less invasive procedure, metaoidioplasty, that creates a neophallus from the hormonally enlarged clitoris.^{1,21} In actuality, most TM opt against external genital surgery. This is related to the expense of the procedures, limited access to experienced surgeons and the potential for complications.¹

Breast surgery represents the most common GCS that does not affect fertility.¹ For TM, the most important masculinizing surgery is mastectomy.¹ As breast size only partially regresses with androgen therapy, mastectomy is often necessary to create a male appearing chest. Similarly, augmentation mammoplasty is often desired by TW to achieve a feminine identity fully.¹ Other nongonadal GCS include numerous facial procedures to promote either masculinization or feminization.

Most guidelines recommend the use of GAHT for at least 12 months before surgical conformation to allow TG individuals to experience and socially adjust to their desired gender. Longer periods may be preferred to allow target tissues to respond to sex hormone stimulation fully. Because surgery that affects fertility is irreversible, gonadal surgery should be reserved for TG individuals who have had an acceptable social transition, are satisfied with their response to GAHT and desire definitive physical changes.^{1,22} Detailed information regarding surgical approaches to TG care is available via the *Guidelines for the Primary and Gender-Affirming Care of Transgender and Gender Nonbinary People*.²¹

CANCER SURVEILLANCE

TW and TM remain susceptible to cancers specific to their biological sex. TG individuals may choose to opt out of cancer screenings because of physical or emotional distress associated with inherent gender dysphoria. It is incumbent on treating physicians to advocate for organ-based routine cancer screenings for all TG patients following current standards.²¹

PROSTATE CANCER

Recent literature suggests that prostate cancer is very rare among TW.¹⁷ While the risk is low, underdiagnosis is possible due to a lack of close monitoring. Therefore, screening should be in concordance with the United States Preventive Services Task Force (USPSTF) guidelines, via a shared decision-making model.³³ Of note, when

prostate-specific antigen (PSA) testing is performed in TW with low testosterone levels, it may be appropriate to reduce the upper limit of normal to 1.0 ng/ml.²¹

CERVICAL CANCER

Cervical cancer screening guidelines for TM who have not undergone hysterectomy are no different than for ciswomen. Unfortunately, papanicolaou testing (PAP) from TM has a 10-fold higher rate of uninterpretable or unacceptable samples vs. CW.³⁴ This directly correlates with an individual's duration of testosterone treatment. It is important to recognize that the speculum and bimanual exam in TM receiving GAHT may be painful due to testosterone-induced vaginal atrophy. Many TM, particularly those with gender dysphoria, may never have had vaginal penetration. Consequently, having a gynecologic exam may be distressing to the point of being unacceptable. Self-collected vaginal sampling for high-risk human papillomavirus (HPV) has been suggested as an alternative to PAP testing for TM. Self-collected PAPs have been shown to yield test results with a very high positive predictive value and may be a consideration for TM.³⁵

BREAST CANCER

Breast cancer screening is more individualized in TG populations; TW who have received feminizing hormone therapy or TM who have breast tissue present should be screened. TW who use estrogen supplementation in conjunction with androgen antagonists have a risk of breast cancer that is greater than for cismen (CM) but lower than for CW.¹² TW with feminized breast tissue and TM who have not undergone complete mastectomy should receive screening mammography as per guidelines established for CG persons. Breast imaging is typically not recommended for TW who have not received GAHT. In keeping with guidelines for CW, clinical breast examination is not recommended for either TM or TW. Mammography is not recommended for TM after a bilateral mastectomy, as mastectomy reduces the risk of breast cancer similar to CW. However, as some breast tissue may remain after surgery, an annual clinical examination of the chest wall and axilla is recommended. For TM who have not undergone a mastectomy, typical screening mammography recommendations apply.³⁶

HORMONE REPLACEMENT AND CARDIOVASCULAR RISK

The effects of cross-sex hormones on cardiovascular (CV) disease risk is the principal concern regarding GAHT safety. Testosterone administration in TM has been associated with reductions in high-density lipoprotein (HDL), increases in total cholesterol, triglycerides and inflammatory markers. However, no studies have demonstrated an increase in CV events among TM using testosterone.¹²

TW using GAHT have an increase in stroke incidence (80%) and venous thromboembolic disease (355%) when compared with CM.¹⁷ This enhanced risk may be related to the hypercoagulable effect of feminizing hormones. Consequently, transdermal estradiol may be preferred in TW aged 45 or older, when there is a

history of thromboembolic or CV disease and in smokers.²³ There is no evidence of increased coronary events in TW using GAHT.¹²

Because CV disease is a prominent cause of morbidity and mortality in both men and women, modifiable CV risk factors, including lipid levels, serum glucose and blood pressure, should be regularly monitored in TG persons and addressed in accordance with guidelines for CG persons.

CONCLUSION

As TG individuals integrate more into mainstream society, there will be an increasing demand for physicians well-versed in TG care. PCPs have a unique opportunity to address the TG population's specific health care needs in a caring and inclusive manner. PCPs must be willing to improve the skills, knowledge and awareness³⁷ necessary to integrate a more comprehensive approach to gender-affirmative care. To best accomplish this, they need to have an understanding of culturally competent TG terminology and a recognition of diversity within the TG culture. Equally important is for physicians to create a safe and welcoming environment for TG patients consciously.

The majority of medical issues affecting TG people are no different from those of the CG population. Hence, PCPs are ideally positioned to assist TG patients in making reasonable, informed choices about their health care needs. This includes decisions regarding physical health, mental health and preventive services. Providers must consider the unique impact that gender dysphoria imparts on TG patients' clinical interactions, including the history, physical examination and diagnostic testing. Special attention should be given to the impact of GAHT and GCS on biologic-based preventive screenings.

The PCP may choose to adopt an active role in hormonal management, via the informed consent model. The resources available through WPATH²², the University of California, San Francisco Center of Excellence for Transgender Health²¹ and the American Association of Clinical Endocrinologists¹ are highly suggested for the PCP interested in doing so. Alternatively, the PCP can be an advocate and provide routine primary care while coordinating referrals for psychiatric, endocrinologic and/or surgical care.

AUTHOR DISCLOSURES:

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BRIEF REPORT

CARDIOVASCULAR RISK FACTORS AND SCREENING MODALITIES IN FIREFIGHTERS

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KEYWORDS:	:	ABSTRACT: Within the field of primary care, preventative medicine represents a novel approach to medical care that promotes health and well-being while simultaneously attempting to prevent disease, disability and death. Cardiovascular disease is one of the leading causes of medical morbidity and mortality in the United States. Certain lifestyle factors have been linked to increased risk of cardiovascular disease and, as such, are topics of focus for the prevention of cardiovascular disease.
Calcium Score	:	
Cardiology	:	
Carotid Ultrasound	:	Various studies show that firefighters have an increased risk for premature cardiovascular disease compared to the general public. Risk assessment remains a paramount focus for the family physician so screening modalities are needed that accurately depict each patient's risk without performing unnecessary testing. Specific testing modalities that should be considered are coronary artery calcium scoring, carotid artery ultrasound and EKG assessment.
EKG	:	
Firefighter	:	

INTRODUCTION

Cardiovascular disease is one of the leading causes of medical morbidity and mortality in the United States.¹ It has been shown in various studies that firefighters have an increased risk for premature cardiovascular disease compared to the general public.² Most firefighter deaths are reported to occur during fire suppression encounters, which on average, comprise 1–5% of their professional career time.² The odds of cardiac death are nearly 90 times greater during fire suppression than during non-emergency duties.³ Cardiac-related events accounted for 44% of the on-duty fatalities over the past ten years.⁴ These figures indicate that the firefighting itself is not the sole cause for mortality within this particular population. The National Fire Protection Association (NFPA) records and maintains mortality statistics for firefighters in the United States. Statistics from the 1970's up until the past decade show that sudden cardiac deaths on duty have been gradually decreasing but remain the number one cause of firefighter on-duty fatality.⁴

BACKGROUND

Certain lifestyle factors have been linked to increased risk of cardiovascular disease and, as such, are topics of focus for the prevention of cardiovascular disease. Typical risk factors for cardiovascular disease for the general population include age, race, gender, obesity, family history, hyperlipidemia, hypertension,

diabetes and tobacco smoking. Some studies have suggested that firefighters have a greater prevalence of these risk factors to explain the increased premature cardiovascular disease.² Firefighters with higher blood pressure as compared with controls showed significantly higher cardiovascular risk.⁴ When risk factors are adjusted and comparable, firefighters also have an increased risk of left anterior descending (LAD) artery lesions compared to non-firefighter controls.² Plaque rupture accounts for most of the cardiovascular death rather than obstructive coronary disease.¹

Firefighting exposes individuals to hyperthermia, smoke, dehydration, physical exhaustion and mental stress. Combustion of carbon-based materials produces particulate matter and carbon monoxide, which has been shown to increase cardiovascular disease morbidity and mortality when exposed.⁶ Premature coronary heart disease (CHD) has been shown to be a common cause of death with firefighters with an average age of death of 44.¹ Serum levels of oxidatively damaged DNA have been shown to be elevated after performing in firefighting courses.⁶ These elevated levels within the blood are associated with systemic oxidative stress, which has been linked to increased risk of cardiovascular disease.⁶

When fully suited up, firefighters often wear approximately 50 pounds of equipment. During a 30-minute simulated fire operation, one study found that the maximal heart rate of participants was 177 beats/minute, the core body temperature was measured to increase on average by 0.9°C and body weight could decrease up to 0.6 kg.² Studies have shown decreased left ventricular contractility, stroke volume, tachycardia and microvascular vasodilation within 30 minutes of performing fire extinction exercises.⁶ Repeated exposure to firefighting has been shown to decrease microvascular function.² Reduced microvascular vasodilation, in particular, is associated with increased peripheral resistance, which increases the incidence of hypertension and left ventricular overload.⁶ One study found that 80% of firefighters had evidence at autopsy of CHD and

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increased heart size (cardiomegaly/left ventricular hypertrophy) after sudden cardiac death.³ Early screening protocols certainly would seem appropriate given the increased cardiovascular risk for this population over the general population. Volunteer firefighters have shown to have a larger number of deaths as compared to career firefighters, with sudden cardiac fatality accounting for the majority of deaths.⁴

CURRENT GUIDELINES

Current guidelines follow the NFPA recommendations for medical testing of firefighters. Standard medical testing includes basic blood analysis, urinalysis, infectious disease screening, cancer screening, pulmonary function testing, chest x-ray, electrocardiogram (ECG), vision testing and audiometric examination.⁴ These guidelines do not recommend additional screening modalities at this time, however, and do not stratify risk from career vs. volunteer firefighters.

Electrocardiogram screening was one of the earliest modalities engineered to detect abnormal cardiac function. ECGs certainly play a role in the detection of cardiac pathology in the symptomatic individual to either find current or past evidence of myocardial ischemia/dysfunction. In the scope of preventative medicine, one study evaluated the application of ECG during exercise stress testing for the evaluation of ST-depression in asymptomatic firefighters with no prior history of coronary artery disease (CAD).¹² In the evaluation of an exercise stress test, parameters such as exercise capacity, blood pressure, heart rate response, subjective symptoms and ECG analysis during the activity/recovery phase go into the overall analysis. The investigators found that both age and heart rate responses were associated with ST-depression but interestingly, common cardiovascular risk factors, BP response and exercise capacity were not.¹² ST-depression indicates subclinical myocardial ischemia and, if found, may identify individuals who could benefit from early treatment.¹³ Elevated average 24-hour heart rate is an indicator of poor sympathetic tone, which has been found to be a consistent finding with on-duty firefighters.¹³ Depressed heart rate variability is another marker for mortality and indicates autonomic dysfunction, increasing the risk for fatal arrhythmic events.¹³ Other ECG findings which should be targeted as potential risk factors include QT-prolongation, left bundle branch blocks, non-sustained ventricular tachycardia and a widened QRS-T angle.¹³

Of these parameters, studies have shown that the most important factor is the ST-segment reaction for evaluating ischemic heart disease, but often, there may be exercise-induced ST-depression even in the absence of ischemic heart disease (false-positive result).¹² It has been observed that master athletes have a higher incidence of false-positive ST-depression compared to sedentary subjects.¹² It is postulated that this phenomenon is due to increased left ventricular mass with secondary repolarization abnormalities. Firefighters, although not technically classified as "master athletes," certainly have higher exercise capacity and go through intensive training as compared to more sedentary populations. As a result, this screening modality is not currently recommended as a successful preventative screening modality due to its inconsistent accuracy.

Carotid artery ultrasound evaluation of carotid intima-media thickness (cIMT) is another screening modality for the evaluation of cardiovascular disease. Elevated cIMT is specifically useful in identifying both clinical and sub-clinical atherosclerosis. Current ACC/AHA guidelines recommend screening in asymptomatic patients with known or suspected carotid stenosis to detect hemodynamically significant stenosis.¹¹ The guidelines also recommend that testing may be performed if patients have carotid bruit on examination but are not clearly established for those with symptomatic CAD, peripheral artery disease or atherosclerotic aortic aneurysm.¹¹ Elevated levels of both triglyceride and LDL are significantly associated with cIMT greater than the seventy-fifth percentile, along with waist circumference and BMI.¹¹ One study found that CHD risk prediction by carotid ultrasound is best utilized in individuals with intermediate-risk (5–20% estimated ten-year CHD risk).⁹

Coronary artery calcium (CAC) has been shown to better predict future coronary vascular disease (CVD) events over cIMT. One caveat, though for CAC screening, is that age is a significant factor when it comes to identifying plaque. Younger patients with atherosclerosis may not have calcified plaque, causing false-negative results.⁹ As a result, there is value in utilizing cIMT with one study identifying plaque in more firefighters with cIMT (36%) over CAC (22%).⁹ Further studies are certainly needed to investigate if this screening modality may be used as standard screening within this population and if the detection of subclinical atherosclerosis leads to better overall outcomes.

Coronary artery calcium scoring is an imaging modality used to assess coronary artery plaque burden. The imaging is performed by coronary CT scanning. The test offers a noninvasive way to evaluate the extent of calcified plaque within the coronary arteries. The calculation of a coronary calcium score has been found to be a superior predictor of coronary events over traditional methods such as the Framingham risk factors.¹ The degree of plaque burden is assigned a score that characterizes the degree of plaque and, thus, the risk of atherosclerotic cardiovascular disease (ASCVD) events. Elevated CAC has been associated with higher subsequent rates of CHD and CVD, with a 67.5% increase in cardiac-related death.⁷

Individuals with a CAC score higher than 100 were associated with a five-fold increased risk of CHD mortality and a three-fold increased risk of CVD mortality as compared with a score of 0.7. Individuals classified as lower risk based on the Framingham risk score may be reclassified to higher levels with CAC scores greater than 100 or coronary artery calcium greater than the 75th percentile.⁸ Diabetes and tobacco use have been found to be the two strongest predictors for elevated CAC scores.² Fasting glucose elevation has been found to be the strongest predictor of the total coronary lesion number and coronary calcium score.⁹ Firefighting itself has been associated with a 41-point increase in CAC score.² Individuals with a lower likelihood of premature cardiovascular disease typically had a lack of abdominal obesity, higher intake of fruits and vegetables, and higher levels of cardiorespiratory fitness.² The American Heart Association and the American College of Cardiology both recommend CAC scoring for intermediate-risk individuals who are undecided regarding initiation of statin

therapy, with intermediate-risk defined as 10-year risk ($\geq 7.5\%$ to $< 20\%$) based on ASCVD scoring.¹⁰

CONCLUSION

Given the increased cardiovascular risk demonstrated by the scientific literature, this high-risk population must receive proper pre-emptive screening and care. Arguably, the current advancements discussed should be considered for universal firefighter health screening. Tailoring screening based on risk factors has been utilized for subsets of the general population and it is the opinion of the authors that occupational risk should be no different. The family physician is in a unique position to deliver this essential service and thus, it is essential for these providers to be up to date with the unique parameters that influence the health of this population.

AUTHOR DISCLOSURES:

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As of 10/5/2020

For more information on how you can contribute to the future of osteopathic family medicine, please contact foundation@acofp.org or (847) 952-5116.



Family Medicine Residency Core Faculty Physician Penn State Health St. Joseph Medical Center Reading, PA

Penn State Health St. Joseph is seeking a BC/BE family medicine physician to join our team as a faculty member in our 6-6 Family and Community Medicine Residency Program in Berks County, PA. Priority will be given to candidates interested in inpatient medicine. The Family and Community Medicine Residency Program strives to provide excellent education in training family physicians to provide comprehensive, compassionate, coordinated and continuous high-quality patient-centered care to the community served by our Program.

Duties include teaching, mentoring, advising, and supervising residents; engaging in scholarly activity; and providing patient care. The residency program fosters a supportive family-oriented environment that encourages work-life balance.

Job Requirements

- Medical degree - M.D., D.O. or foreign equivalent
- Completion of an accredited Family Medicine residency program
- Board certification/eligibility in Family Medicine
- Experience in an academic setting preferred
- Conversational Spanish speaking skills preferred



PennState Health

TO APPLY, PLEASE SEND YOUR CURRICULUM VITAE (CV) TO:

Greg Emerick, MHA, FASPR - Physician Recruiter

Department of Human Resources • Penn State Health

E-mail: gemerick@pennstatehealth.psu.edu • Phone: 717-531-4725

PATIENT EDUCATION HANDOUT

Obsessive-Compulsive Disorder: Symptoms And When To Seek Treatment

Laura Chachula, DO

Ronald Januchowski, DO, FACFP, Editor • Paula Gregory, DO, MBA, CHCQM, FAIHQ, Health Literacy Editor

SYMPTOMS OF OCD MAY INCLUDE ONE OR BOTH OF OBSESSIONS AND COMPULSIONS

OBSESSIONS are intrusive and persistent thoughts, images or urges that recur constantly. For example, individuals might be obsessed with cleanliness or germs and constantly think about these thoughts; if they act on these obsessions, these become compulsions. They may find themselves constantly washing their hands or sanitizing their house out of fear of contamination. Common obsessions include: fear of germs or filth, fear of thinking evil thoughts, constant need to create order, balance and exactness, and a need for frequent reassurance.

- Fear of germs or filth
- Fear of thinking
- Evil thoughts
- Constant need to create order
- Balance and exactness
- A need for frequent reassurance

COMPULSIONS are behaviors or mental acts that individuals feel forced to perform either due to intrusive thoughts or self-made rules that must be followed to decrease their anxiety. These acts can be thought of as rituals the individual must perform. Examples include touching items in a certain sequence when entering a room or repeatedly counting to a particular number. Even if completing these acts does not make sense to the individual, doing so can help relieve the distress of the compulsion. Common compulsions include repeating rituals such as:

- Touching objects
- Counting
- Frequently checking that doors are locked
- Checking to make sure appliances are turned off or unplugged even when they know they are
- Repetitive grooming
- Self-cleaning acts such as washing hands, showering or brushing teeth

WHEN TO SEEK TREATMENT

Your doctor can do an assessments and help treat your symptoms. You should seek treatment when symptoms become overwhelming or interfere with daily activities. This may include symptoms that occur for 2–3 hours daily, are severe, cause increased anxiety or are hard to resist acting upon or controlling. Because patients may or may not have insight into the irrational nature of their obsessions or compulsions, family or close friends may need to help guide them to seek help.

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PATIENT EDUCATION HANDOUT

Atopic Dermatitis 101 for Parents

MAJ Nathaniel R. Watts, DO; MAJ James M. Silcox, DO

Ronald Januchowski, DO, FACP, Editor • Paula Gregory, DO, MBA, CHCQM, FAHQ, Health Literacy Editor

WHAT IS ATOPIC DERMATITIS?

Atopic dermatitis is more commonly called eczema. Eczema is a non-contagious skin condition causing dry, itchy, red skin. Eczema frequently affects the creases of joints, particularly the elbows and knees, but can occur anywhere on the body.

WHO DOES IT AFFECT?

Eczema is also common in children and tends to run in families. It is often diagnosed in children before the age of four who also have seasonal allergies, hay fever, food allergies or asthma.

HOW IS IT DIAGNOSED?

Eczema is usually diagnosed by having a doctor examine your child's skin. The majority of the time, no other testing is needed.

HOW IS IT TREATED?

- Bathe your child every night in lukewarm water (hot water can irritate the skin).
- Avoid scrubbing irritated areas with rough washcloths or sponges.
- Allow the skin to air dry or pat the skin dry with a towel.
- Apply medication prescribed by your doctor (often a topical steroid) only to the affected skin, while it is still damp.
- Apply moisturizer to the rest of the body to lock in the moisture.
- Remember to use moisturizers at least two times per day and when the skin feels itchy or looks dry.
- Use moisturizers that are ointments or creams because they are better than lotions for treating dry skin.
- Avoid irritants such as:
 - o Tobacco smoke
 - o Fragrances (laundry detergents, cleansers, moisturizers)
 - o Heat
- Give bleach baths by dissolving ½ cup of bleach in a full bathtub of water and soak your child for 15 minutes two to three times per week to help prevent infection.

WHEN TO SEE THE DOCTOR?

- If the rash worsens, spreads or you have any concerns it might be infected
- If your child is itching a lot and/or having difficulty sleeping at night
- If the treatments above are not improving the rash or your child's symptoms
- If you have been using a topical steroid (prescribed by your doctor) for more than two weeks with no signs of improvement

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PATIENT EDUCATION HANDOUT

Gender Transitioning: Medical Options

Alejandro Camacho, DO

Ronald Januchowski, DO, FACOFP, Editor • Paula Gregory, DO, MBA, CHCQM, FAHQ, Health Literacy Editor

Gender transitioning is a process taken to become the gender you best identify with on the inside. Pharmacological and/or medical procedures occur to transition from a male-to-female or female-to-male, which can take months to years. During this time, it is essential to have a reliable social support system when going through this change.

There are three main steps to transition from one gender to another. First, living day to day in the gender you identify with, i.e., changing your clothes, hair, breast binding, breast/buttock padding, genital prosthesis and/or genital tucking. Second, using pharmacological therapy, i.e., hormones, after a minimum of three months of being in the newly identified gender. Third, having gender affirmation surgery after at least a year of taking hormones.

MEDICAL OPTIONS FOR GENDER TRANSITIONING

Female to male

- Speech therapy to help you feel comfortable in your newly identified gender role.
- Surgical
 - Chest surgery to remove breasts
 - Creating a male chest via placement of pectoral implants
 - Genital surgery to remove the uterus, ovaries and fallopian tubes
 - Surgical removal of the vagina
 - Surgical creation of a penis:
 - Surgical creation of a penis by taking hormones to enlarge the clitoris and using skin flaps from certain part of your body such as the forearm or thigh.
 - Other surgical procedures can include liposuction and lipofilling

Male to female

- Speech therapy to help you feel comfortable in your newly identified gender role
- Surgical
 - Chest surgery to create breasts via implants
 - Genital surgery to remove the penis and testicles
 - Surgical creation of a vagina
 - Other surgical procedures can include thyroid cartilage reduction, liposuction, lipofilling and hair removal

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PATIENT EDUCATION HANDOUT

Middle Ear Infection: How OMT Can Help

Katherine Liang, MD

Ronald Januchowski, DO, FACOFP, Editor • Paula Gregory, DO, MBA, CHCQM, FAIHQ, Health Literacy Editor

Middle ear infections, also known as acute otitis media (AOM), is an infection behind the eardrum. Common symptoms include fever, earache, fullness in the ear, ear drainage, trouble hearing and headaches. Children are more likely to get AOM than adults due to their anatomy. In children, symptoms may include ear tugging, fussiness, difficulty sleeping, changes to activity and decreased oral intake. The diagnosis of AOM requires a physical exam and viewing the ear using an otoscope. Bacteria or viruses can cause AOM. Symptoms related to ear infections may resolve on their own in a few days, while some ear infections require antibiotics to resolve. Your provider may recommend close observation, over the counter medicines and/or prescribe antibiotics depending on your medical history, symptoms and exam findings.

HOW CAN OMT HELP WITH MIDDLE EAR INFECTIONS?

Osteopathic manipulative therapy (OMT) is a hands-on technique to diagnose and treat various medical conditions. It can be used to complement medical and surgical management in the treatment and prevention of AOM. Two commonly used techniques are the Galbreath maneuver and auricular drainage technique.

GALBREATH MANEUVER OMT TECHNIQUE:

- This treatment works on the eustachian tube, which connects the middle ear to the back of the nose
- Your provider will make small guide movements of the jaw
- This will increase fluid drainage from the middle ear through the eustachian tube

AURICULAR DRAINAGE OMT TECHNIQUE:

- This treatment works on the skin and muscles around the ear
- Your provider will apply guided pressure and rotate the skin and soft tissue around the ear in a clockwise and counterclockwise manner
- This maneuver can help relieve lymphatic congestion around the ear

Your provider may use many other techniques targeted towards the head, neck and ribs to treat and prevent AOM. Please discuss with your osteopathic physician if you have any questions regarding treatment for AOM.

WHERE CAN YOU GET OMT?

You will need to locate a Doctor of Osteopathic Medicine (DO) or Doctor of Medicine (MD) with osteopathic certification to obtain OMT. These are physicians who attended four years of medical school and have additional medical training to perform OMT. Use osteopathic.org to locate an osteopathic physician in your area.

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INTENSIVE OSTEOPATHIC UPDATE ON-DEMAND

Osteopathic family physicians and residents from across the country joined ACOFP for the launch of the newly-reimagined Intensive Osteopathic Update (IOU) virtual experience in August. The event featured more than 50 sessions across four tracks: evidence-based medicine, practice management, health & wellness, and OMT.

With IOU On-Demand, you can still benefit from the CME event of the season, earn more than 40 hours of AOA Category 1-A CME credit and learn from the wide variety of topics—all from the safety and convenience of your home or office.

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