

OFP

Osteopathic Family Physician

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FAMILY PHYSICIANS

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EDITOR'S MESSAGE

Yes, Healthcare is Complicated

RESEARCH ARTICLE

Effectiveness of a Clinically
Oriented Motivational Interviewing
Training Program

REVIEW ARTICLES

To Circumcise or Not to Circumcise

Ethical Considerations in
Prescribing Opioids or Not

Sleep Disorders & Treatment

CLINICAL IMAGES

Keeping Slipped Capital
Femoral Epiphysis in Mind

PATIENT EDUCATION HANDOUT

Circumcision



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- Chronic Abdominal Pain: Tips for the Primary Care Provider
- Combating the Opioid Prescription Epidemic: Appropriate vs. Inappropriate Prescribing
- CPPD: Common and Under Recognized
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Introduction

Methods

Results

Discussion

Conclusions

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EDITOR'S MESSAGE

Yes, Healthcare is Complicated

Amy J. Keenum, DO, PharmD, Editor, *Osteopathic Family Physician*

Yes, Healthcare is complicated.

Are family doctors doing circumcisions? Osteopathic family physicians rounding in the nursery or delivering babies have done so for many years. The article this month is not a procedural publication but is more about the ethical discussion around the idea of circumcision. Should parents have the right to make the decision about the genital surgery of their child? The article also discusses many other issues related to circumcision.

The longest article of this edition is a review of the diagnosis and treatment of sleep disorders. The topic could be a book so it's the abbreviated version. The article starts with insomnia, the most common of sleep disorders. Not everyone who has insomnia presents to the doctor and if they do, most are managed in the primary care physician office. Insomnia is treated with hypnotics. The training of physicians causes circadian rhythm disturbances. Shift work or working all night and jet lag are examples of circadian rhythm disturbances. Sleep is the best treatment but may need hypnotics to achieve. Sleep disturbed breathing disorders are a category that includes obstructive sleep apnea and is treated mostly with CPAP but the consideration of an oral device is appropriate in some cases. Sleep behavior disorders include all the bizarre behaviors patients may do while asleep like sleep walking, sleep talking and night terrors. Daytime sleepiness disorders include narcolepsy and idiopathic hypersomnias. Stimulants are the most common treatment of this group of disorders. Sleep movement disorders include restless leg syndrome that is commonly treated with low dose short acting dopamine agonists. Bruxism is the last sleep disorder discussed which is treated with a mouth guard.

Our clinical image entry has radiographs and a case report demonstrating slipped capital femoral epiphysis. The case demonstrates the 1) classic age (between 10-15) 2) pain in the knee radiating to the ipsilateral hip 3) male and 4) obese. The suspicion is confirmed by radiographic imaging, (plain x-rays) The author discusses the differential diagnosis in this setting and it is a memorable discussion.

More ethics in Ethical Considerations in Prescribing or Withholding Opioids for Chronic Pain. The author discusses the four basic bioethical principles – beneficence, non-maleficence, justice and autonomy and the application to the dilemma of prescribing narcotics or not prescribing them. The author discusses the considerations for and against prescribing narcotics in both acute and chronic pain.

Who would guess, healthcare is complicated?

FROM THE PRESIDENT'S DESK



ACOFP Going Forward: Five Words to Remember

Rodney M. Wiseman, DO, FACOFP *dist.*
2017 - 2018 ACOFP President

As osteopathic physicians, we are living in uncertain times. The changes in healthcare continues, and we are all trying to adapt to this new normal. The foundation upon which we stand keeps shifting when once that same foundation was stable. How we are educated, practice, get paid and certified continually require us all to keep adapting to our profession.

I feel this most acutely as a small-town doctor in Pearland, Texas. Like many of you, I struggle with all the electronic medical records that I must go through just to do my job. I want to treat my patients, not fill out medical records, although I realize it's an important part of the job. I went into osteopathic family medicine to work with patients, touch my patients and heal them that way.

So now as your ACOFP president, I'm hoping to stabilize our profession by protecting our identity and our osteopathic distinctiveness as much as I can, to help you cope with all the changes that are happening today and those that you will confront in the future.

In that framework, I give you five words – growing, diverse, engaging, advocate and osteopathic – that I want you to remember going forward with the ACOFP.

Growing

Like the osteopathic profession, the ACOFP is increasing its membership. After a few years of stagnation and in some cases decline, the ACOFP membership jumped nearly seven percent in 2016. What accounts for such a jump? It's likely due in part to the increase in new osteopathic physicians, but also our membership retention is about 90 percent every year.

Another growth indicator is our Annual Convention registration – at Las Vegas in 2015 we were at near-record attendance. At Puerto Rico in 2016 we would have experienced record attendance, but had to refund 180 registrations from those who were concerned with the Zika threat. This year in Kissimmee, Florida in March we had near-record registration. Our annual Intensive Update & Board Review course is pushing 350 registrants. Overall, more than 2,500 members attended live CME events in 2016.

Diverse

The ACOFP values gender, ethnicity and age, size and type of practice, areas of expertise, such as policy, practice management and academics. For example, between 2012 and 2016, female membership increased by 10 percent. About 42 percent of membership is female today, and more than half of our resident and student members are female. The ACOFP Education and Research Foundation financially contributed to the PBS documentary: "The Feminine Touch: The History of Women in Osteopathic Medicine," which will be released this year.

Engaging

The ACOFP is continually trying to engage our busy physicians. So, this year, the ACOFP is starting Special Interest Groups, called "SIGs." These online communities will give likeminded physicians with specific interests' greater opportunity to network and share ideas.

SIG areas of interest include:

- Direct Primary Care
- Diversity & Inclusion (LGBTQ Community & Ethnic Minorities)
- Men's Health
- Military
- Osteopathic Principles and Practices
- Public Health and Wellness
- State Society Leaders
- Women in Medicine
- Young Physicians

To join a SIG, access your online ACOFP member profile and check a box based on your area of interest.

Advocate

The ACOFP is actively lobbying legislators, regulators and the Trump Administration. Recently, the ACOFP sent a letter to the Trump Administration and Congress expressing its desire to ensure that family medicine be a central focus of any healthcare system reform.

Also, ACOFP is involved in the sponsorship of Family Medicine for America's Health and its media initiative called "Health is Primary" that seeks to promote the primacy of family medicine. We want the public to know family medicine is the backbone of the U.S. healthcare system.

Osteopathic

The ACOFP is committed to the fundamental principles of osteopathic medicine. The ACOFP Journal – *Osteopathic Family Physician* – is one way we do that. It's distinctively osteopathic with articles writing by members.

We are also creating a new package called "Essentials for Osteopathic Education and Recognition in Family Medicine," which is a compilation of OMT videos, the ACOFP textbook, sample residency curriculum, apps and other training resources.

This hub of osteopathic content also will be available to allopathic training programs that now have a greater incentive to recruit DO students who want to continue their osteopathic training into residency.

So, I hope these five words help you realize that the future is bright for osteopathic family physicians even though we are living such changing times. The ACOFP will be there for during these times, helping you every step of the way.



Rodney M. Wiseman, DO, FACOFP *dist.*
2017 -2018 ACOFP President



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RESEARCH ARTICLE

Effectiveness of a Clinically Oriented Motivational Interviewing Training Program in Increasing Skills & Changing Perceptions

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Keywords:

Motivational Interviewing

Decision-Making

Communication Skills

Standardized Patients

Health Promotion

Continuity of Care Training

Objective: This study assessed: 1) the effectiveness of a Motivational Interviewing (MI) training program to improve the skills of family practice residents, and 2) resident and Standardized Patient's perception of the effectiveness of training and beliefs about MI in clinical practice.

Methods: Seventeen family practice residents completed training over two months, followed by two months of reflection with peers and the researchers. Standardized Patient interactions were video-taped at baseline, post-intervention, and 3 months later, and were independently assessed using the Behavior Change Counseling Index (BECI). Residents and Standardized Patients completed reflections at the end of each interaction, and residents completed a post-training survey.

Results: Thirteen residents completed the intervention and assessments. Average BECI scores increased from 0.74 to 2.26, indicating positive change in residents. All residents demonstrated an increase in knowledge and an increase in their perceived ability to use MI with patients.

Comments: Adding individualized feedback is needed to maintain skills and confidence among trainees. Research on the effect of the use of MI on patient outcomes is also needed.

Conclusion: Incorporating MI training into a medical school curriculum is a potentially feasible, efficient and effective way of improving patient outcomes related to lifestyle behaviors.

INTRODUCTION

Motivational interviewing (MI) is an evidence-based strategy that can be used by health practitioners to help patients make quality treatment decisions, comply with treatment recommendations, and change their health-related behaviors to increase their overall quality of life.¹ Although clinical encounters with patients are brief (often less than 15 minutes), modified MI can effectively create a collaborative environment between the health practitioner and the patient where the patient feels empowered to make decisions that are in his/her best interest, rather than merely following a healthcare provider's prescribed action plan. When shared decision-making is utilized, it is more likely that patients will comply with a treatment strategy.^{2,3}

Using MI in the clinical setting incorporates establishing an agenda and rapport, identifying ambivalence, asking open-ended questions, reflective listening, and tailored advice giving/education as the main techniques for engaging the patient.¹ The goal of MI in this brief encounter is to empower the patient to identify the need for change and express the desire to change him or herself, rather than being told to do so by a health practitioner.² Typically, medical practitioners fall into this habit of simply giving advice to their patients, hoping this will be an effective strategy in decision-making. Unfortunately, this counseling style has been found to be effective only 5-10% of the time in the areas of smoking cessation and addiction management.³ In addition, practitioners are rarely trained in lifestyle management and behavior change, so treatment is often unsuccessful, reinforcing the idea that treatment is not worthwhile.⁴ MI is a more effective method for helping people become motivated to change that is patient-centered and is practically and economically feasible, given that it can occur within the

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time frame of a typical 15 minute patient visit with a practitioner, with multiple encounters increasing the positive effect.⁵ In a systematic review and meta-analysis, 72 randomized controlled trials were assessed for effectiveness of MI training on patient outcomes. All studies used indirect measures (e.g. questionnaires) to measure effect; 46% also used direct measures (health outcome, direct/indirect indicators and utilization of healthcare services). The results indicated that physicians obtained a positive effect on direct and indirect measures in 75% of the studies.⁶ In a randomized controlled trial on the effectiveness of clinicians trained in MI on changing patients behavior related to diabetes control, results indicated that patients that were treated by trained MI clinicians were significantly more motivated to change their behavior versus those treated by non-trained clinicians.⁵

A significant body of research indicates that physicians who have been trained in MI have used it successfully with their patients. In brief, Soderlund et al.⁶ report in their systematic review of 10 studies on MI training that general health care practitioners view MI training as favorable. Rubak et al.^{7,8} report that those trained in MI believe that MI is a practical approach that physicians can use as part of routine care and that the outcomes will be more favorable than the traditional method of simply telling patients what to do. Saitz et al.⁹ reported in their study that 91% of the clinicians felt that the training affected their practice in a positive manner and physicians in a study by Rubak et al.⁵ reported that MI is “realistic and usable in daily work” and is “more effective than traditional advice giving.” Lastly, and, most importantly, in a randomized controlled trial comparing the patient outcomes of physicians trained in MI to those in the control group, at one year the patients of the MI trained physicians were more motivated to change their behaviors compared to control participants.⁵

While primary care physicians play a central role in counseling patients in health matters, a body of research shows that they do not have the skills in behavior change counseling, nor do they feel confident in their ability to help patients change their health-related behaviors.¹⁰ Therefore, it would be beneficial to begin MI training early in the physician preparation process. Several studies have shown success in this area, with Haeseler et al.¹¹ recommending training in MI as early as year three of medical school. In a randomized controlled trial of 131 medical students, the MI trained group showed significantly better MI skills than did the control group.¹⁰

Rationale for The Present Study

While the research is clear that MI has the potential to change both the counseling behaviors of the clinician and the health behaviors of the patient, Barwick et al.¹² state that more work is needed to understand how delivery of MI training can best be implemented. Effective training programs tailored for using MI in brief clinical encounters are needed. Additionally, previous studies have relied on self-reported use of MI strategies through post-intervention surveys of participating physicians as the sole means of demonstrating the success of the training and effective use of MI strategies. In the present study, we used a more rigorous method to demonstrate the effectiveness of the training program for brief clinical encounters, which includes use of standardized patients. This offers an objective measure of skill improvement and is a verifiable means to assessing skills.¹³

Purpose of The Present Study

The purpose of this study was to assess: 1) the effectiveness of a motivational interviewing (MI) training program for use in clinical encounters to improve the skills of family practice residents, and 2) resident and standardized patient perception of skills, resident knowledge, perceptions of the effectiveness of training, and beliefs about MI in clinical practice. Specifically, changes in the following outcomes were measured:

1. Skills of using MI using the Behavior Change Counseling Index (BECCI)
2. Perceptions of resident and standardized patient regarding use of MI skills
3. Knowledge of MI core skills in brief, clinical encounters
4. Perceptions of the effectiveness of training
5. Beliefs about MI in clinical practice

METHODS

Participants

Family practice residents were recruited from the family practice residency program of an osteopathic medical school. Residents in this program participated in required weekly educational sessions as part of their program; therefore it was convenient to incorporate the MI training into their previously established curriculum with minimal burden to the residents. Before the training occurred, we received full approval from the Institutional Review Board for our study.

Instruments

To assess the effectiveness of the MI training in increasing skills, resident standardized patient encounters were scored using the Behavior Change Counseling Index (BECCI) at baseline, end-of-intervention and 3-month follow-up. Self-report perceptions of resident use of MI skills in the standardized patient encounter were assessed using electronic reflection forms at baseline; end-of-intervention and 3-month follow-up. Standardized patients also completed a self-report electronic reflection form following each encounter.

BECCI - All standardized patient encounters were videotaped and independently scored by two of the researchers using BECCI, a previously-validated standardized tool that has demonstrated statistically acceptable levels of internal consistency, inter-rater reliability, intra-rater reliability, and responsiveness (i.e. sensitivity to changes in subjects from pre- to post-test).¹³ We selected BECCI because it provides a quantitative score that can be used to compare outcomes at multiple points over time. Each of the 11 items on the index are scored using a Likert scale, indicating to what extent the practitioner carried out the action (0 = Not at all, 1 = Minimally, 2 = To some extent, 3 = A good deal, 4 = A great extent). Each item on the BECCI scale is listed in Table 1 (page 12).

We completed the required training for using BECCI as a scoring tool, which included three readings, a training video, and thorough review of the manual. The two members of the research team performing the scoring also practiced by independently scoring MI encounters not associated with this study, and reviewing each other's

scores until mutual agreement and understanding of the scoring mechanism was reached. An 84% inter-observer agreement rate was achieved for each of the 11 items between the raters.

MI Skills Reflection Forms - The residents completed a self-report electronic reflection form that asked them to rate their effectiveness with the patient on the following core skills of MI: reflective listening, showing empathy, asking open-ended questions, resisting the righting reflex, and giving advice in an MI style. Each of the skills were rated using a 5-point Likert Scale (5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree). They were also asked two open-ended questions: (1) list at least one thing they felt they did well in the interaction and (2) list at least one thing they felt they could have done better and would like to improve upon.

Standardized patients completed an electronic reflection form assessing their perception of resident skills in the following areas: asking open-ended questions, using reflective listening, showing empathy and respect for patient choice, and giving tailored advice. Each of the skills was scored using a dichotomous scale (Agree/Disagree).

Post-Training Survey - The residents completed an electronic survey on the final day of training. The survey assessed three areas: (a) resident knowledge of the righting reflex, advice giving using an MI style, identifying ambivalence and how to respond, and proper use of behavior change scales (4 items), (b) perceptions of the effectiveness of the training (6 items) and (c) beliefs about MI in clinical practice (5 items).

Standardized Patients

Standardized patients were trained by the staff of the University Clinical Education and Assessment Center/Standardized Patient Lab using cases developed by the research team. Each interaction included typical family practice patient interactions, and was focused on changing health behaviors such as improving dietary habits, increasing exercise or smoking cessation. Two males and two females were used in the interactions, and all presented as middle-aged relatively healthy patients in need of lifestyle changes to prevent or treat chronic diseases such as diabetes, high blood pressure, and obesity. Standardized patients were paid their typical fee from the Clinical Assessment Center for their participation in the study.

Procedures

Seventeen family practice medical residents completed one 15-minute standardized patient interaction during the month prior to the start of training. The encounters were videotaped and independently scored by two of the researchers using BECCI. Residents and standardized patients completed the MI Skills Reflection Form immediately following the encounter.

Following this encounter, two members of our research team met with the residents four times over a two-month period to provide eight total hours of MI training. Sessions took place every other Friday afternoon for two hours from October 2014 - November 2014. Training included short didactic lessons, case studies, large and small group discussions, role plays, and individualized feedback and coaching to help residents develop the following skills related to MI: establishing an agenda and rapport, identifying am-

TABLE 1:

Teaching Activities Utilized

Session	Core Skills / Technique	Methodology
One	Overview of Motivational Interviewing Establishing Rapport Agenda Setting	Didactic Lecture Video examples of MI in brief patient encounters Role plays Group discussion
Two	Open-Ended Questions Identifying Ambivalence Identifying Change Talk	Debriefing of use of skills with patients with Q/A Short didactic lecture Sample patient case scenarios with role play and small group coaching Worksheets with sample open-ended questions
Three	Reflective Listening	Debriefing of use of skills with patients with Q/A Short didactic lecture Sample patient case scenarios with role play and small group coaching Video examples
Four	Informing "MI Style" Goal Setting Individual Skill Evaluation	Debriefing of use of skills with patients with Q/A Short didactic lecture Individual Feedback and Coaching based on SP encounter #2

bivalence and change talk, asking quality open-ended questions, reflective listening, and tailored advice giving/education. Table 1 provides more detail on the content of the training sessions. Following the last training session, the residents electronically completed the Post-Training Survey.

Residents completed a second standardized patient interaction during the month following the eight weeks of training to allow for a post-program evaluation of his/her use of MI strategies. The 15-minute encounters were videotaped and again independently scored by two of the researchers using BECCI. Similar to baseline, the residents and standardized patients completed the MI Skills Reflection Form immediately following the encounter.

Following the second encounter, two members of the research team met with the residents on four Friday afternoons between February and March of 2015 to follow-up with the training program discuss their experiences with the use of MI in practice. They were invited to share their confidence in using MI, how frequently they were using it with their patients, the barriers they faced to us-

TABLE 2:

Itemized and Total BECCI Scores at Baseline, End-of-Intervention and 3-Month Follow-Up (Mean Scores on a 1-4 Scale)*

MI Skill	Baseline (n=17)	Post (n=13)	Change from Baseline	Follow-up (n=13)	Change from Baseline
Invited patient to talk about behavior change	0.61	1.61	1	2.67	2.06
Demonstrated sensitivity to talking about other issues	0.81	2.42	1.61	2.08	1.27
Encouraged patient to talk about current behavior or status quo	1.84	2.71	0.87	2.71	0.87
Encouraged patient to talk about behavior change	0.32	2.93	2.61	2.92	2.60
Asked questions to elicit how patient thinks and feels about topic	0.87	2.85	1.98	3.00	2.13
Used empathetic listening statements when patient talks about the topic	0.41	2.79	2.38	1.67	1.26
Used summaries to bring together what the patient says about the topic	0.06	1.58	1.52	0.79	0.73
Acknowledged challenges about behavior change that the patient faces	0.35	2.44	2.09	1.79	1.44
When providing information, it is sensitive to patient concerns and understanding	1.31	2.63	1.32	2.08	0.77
Actively conveyed respect for patient choice about behavior change	1.08	3.04	1.96	3.29	2.21
Exchanged ideas about how the patient could change current behavior	0.47	2.44	1.97	1.83	1.36
Total	0.74	2.49	1.75	2.26	1.52

+ 0 = Not at all 1 = Minimally 2 = To some extent 3 = A good deal 4 = A great extent

ing it, and their intentions to continue using it. Written notes were made at these meetings to document the feedback offered by the residents. Individualized coaching and feedback was given to each resident in the form of mutual review of their second standardized patient encounter.

Residents completed a third (and final) standardized patient interaction during the month following the final Friday afternoon session to assess their use of MI strategies. The 15-minute session was videotaped and independently scored by two of the researchers using BECCI. Residents and standardized patients completed the MI Skills Reflection Form immediately following the encounter.

Data Analysis

Given that this was a pilot test of the training program with a small sample size and no control group, we limited our analyses to descriptive statistics. Inferential statistics (paired sample t-tests) would not be appropriate due to the power of the test being too low. Therefore, p-values of the differences in means from baseline, end-of-intervention and 3-month follow-up are not reported. For each resident, the BECCI scores from both researchers were combined to find the average score of each of the 11 items. The total BECCI score was calculated by taking the average of each of the 11 items on the index, as directed by the BECCI manual. For each of the survey items on the Reflection Forms and Post Training Survey, percentages were calculated.

RESULTS

Participants

Of the 17 residents who began the training, 13 completed all training sessions, standardized patient encounters, and baseline, end-of-intervention and 3-month follow-up surveys. Ten (56%) residents reported no previous structured training in counseling; two of the residents reported having a bachelor's degree in psychology, four reported undergraduate medical school training using standardized patients and one gained experience in counseling as a research assistant.

Change in MI Skills as Assessed by BECCI

BECCI evaluates the extent to which the practitioner carries out each of 11 separate action items. Baseline, end-of-intervention and 3-month follow-up scores of each of these items are reported in Table 2. Each item is rated on a scale of 0 to 4, with 4 being the highest rating. Overall, the average score of the residents on all 11 items combined increased from 0.74 to 2.49 at end-of-intervention, and decreased to 2.26 at 3-month follow-up. This indicates that overall, residents increased from using MI skills less than “minimally” at baseline to between “some extent” and “a good deal” at 3-month follow-up.

As reported in Table 2, residents saw the most improvement in the following areas: (a) encouraging patients to talk about change, (b) asking good open-ended questions, (c) reflective listening, (d) acknowledging challenges to making changes, (e) conveying respect for patient choice, and (f) exchanging ideas for change with the patient. Each of these items was specifically covered in the training, indicating residents may have learned these skills from the training program. At 3-month follow-up, all skills were maintained (indicated by improvement from baseline), with some skills showing further improvement from end-of-intervention: (a) inviting to talk about change (agenda setting), (b) asking good open-ended questions, and (c) conveying respect for patient choice. Additional coaching and feedback was given to each resident following the end-of-intervention, which may have helped increase these skills. Although no skills were rated as a 4 (“to a great extent”) at end-of-intervention or 3-month follow-up, at end-of-intervention 82% of the scores fell in

the range of “to some extent” to “a good deal.” At 3-month follow-up, 36% of the scores were in this range, indicating the need for further coaching and feedback to maintain skills. Figure 1 shows improvement in the core skills specifically covered in the training program.

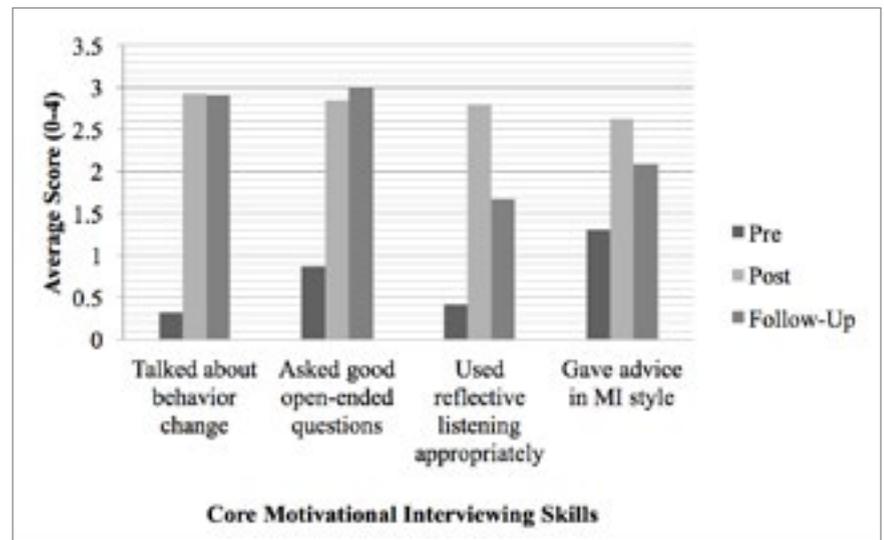
Results of Self-Report Reflections of Resident & Standardized Patient MI Skills

Resident MI Skills Reflection - Table 3 shows the self-perceptions of the residents regarding their ability to use MI skills and how these perceptions changed among the group from baseline, end-of-intervention, and 3-month follow-up. In general, perceived skills improved for all of those surveyed at post-test, with the skill of asking “quality open-ended questions” showing the most improvement and “using an approach that was supportive and encouraging for the patient to make positive lifestyle changes” showing the least improvement. At follow-up, perceived skills improved for all of those surveyed from baseline, and all but 2 perceived skills improved further from post-test: “quality open ended questions” and “showing respect for patient choice.” The most marked improvement in perceived skills occurred in reflective listening and showing empathy. Additionally, there was a 15% increase in the belief that the encounter they had with the patient will actually lead to positive changes in behavior. The open-ended questions (not included in Table 2) reflected that they would like to work on giving advice that is aligned with patient readiness to make a lifestyle change and asking the patient quality open-ended questions. They felt they did well on listening reflectively to the patient.

Standardized patients MI Skills Reflection - Table 4 shows the perceptions of the standardized patients regarding the residents’ ability to use MI skills and how these perceptions changed among the group from baseline, end-of-intervention, and 3-month follow-up. As noted in the table, the standardized patients felt that the most improvement from baseline to end-of-intervention was made in showing empathy, using a supportive approach, and showing respect. One skill, understanding what the patient values in terms of their health, was rated lower at end-of-intervention. At the 3-month follow-up, standardized patients reported that the resident’s maintained or improved all skills.

FIGURE 1:

Changes in Core Motivational Interviewing Skills as Assessed by BECCI at Baseline, End-of-Intervention and 3-month Follow-Up



Results of Post-Training Survey

Knowledge - Of the 17 medical residents who began the training, all completed it and 13 (81%) participated in the end-of-intervention survey. In four survey items designed to test their knowledge, 12 (92%) of the 13 survey completers were able to identify ambivalence in a patient, how to respond appropriately to ambivalence, and describe the “righting reflex” (i.e. the habit of arguing for change for the patient vs. allowing the patient to argue for change). Ten (77%) of the 13 were able to identify how to appropriately use a readiness scale and describe at least two examples of how to give advice using an MI approach.

Perceptions of Effectiveness of Training - As shown in Table 5 (page 16), 12 (90%) of the residents agreed with most of the statements regarding the effectiveness of the training program. Ten (77%) of the residents felt confident in their abilities to use MI when talking to patients as a result of the MI training and 9 (69%) felt that MI helps them in patient care.

Beliefs about MI in Clinical Practice - Twelve (90%) of residents believed MI offers an advantage over “advice giving”, and 11 (85%) believed “the methods of MI are realistic and usable in daily work”. Approximately 70% agreed that “MI is more effective than traditional advice giving” and that “the methods of MI are time consuming.” Very few residents (n=4, 31%) agreed, “it is difficult to change my ways in the patient-doctor relationship.”

Qualitative Feedback from Residents - At each training session, residents’ comments and suggestions were recorded by the research assistant. The main themes that were evident in these comments were that they intended on using MI in their clinical practice, they believed the training was effective but could use more one-one coaching, the training should be more readily available (i.e. online), and that training should occur earlier in medical education so MI becomes standard practice and not a “new skill.”

TABLE 3:

Resident Reflections at Baseline, End-of-Intervention, and 3-month Follow-Up*

I believe that...	Baseline (n=17)	Post (n=13)	Change from Baseline	Follow-up (n=13)	Change from Baseline
I listened attentively to the patient.	81	92	+11	96	+15
I showed empathy to the patient by acknowledging their emotions, concerns or point of view related to making lifestyle changes.	81	92	+11	96	+15
I asked the patient quality open-ended questions that encouraged them to share what they value in terms of health.	62	77	+14	72	+10
I showed respect for the patient’s right to make his/her own choice, even if I didn’t agree with the choice.	81	92	+11	88	+7
The advice I offered the patient was aligned with what they shared with me in terms of their readiness to make a lifestyle change.	87	92	+5	96	+9
I used an approach that was supportive and encouraging for the patient to make positive lifestyle changes.	75	77	+2	88	+13
The patient will take positive steps to address his/her health risks after this encounter.	69	77	+8	84	+15

+ Numbers represent percent of residents that strongly agreed or agreed with each statement as measured by a 5-point Likert scale.

COMMENT

There were two primary purposes of this study. First, we assessed the effectiveness of an MI training program designed specifically for family practice residents and the possible impact it can have on patient interactions using an objective measure. Second, we assessed changes in perceptions, knowledge, and beliefs about MI in clinical practice. In response to the first purpose statement, we found that an objective measure indicated that residents improved in their use of MI strategies with patients over the course of a training program. While this study design does not permit the inference of causality, these pilot data suggest that the training program could be related to the improvement in the MI skills of the residents.

In response to the second purpose statement, we found that the majority of residents were ready to improve their skills in giving advice that is aligned with a patient’s readiness

TABLE 4:

Standardized patient Reflections at Baseline, End-of-Intervention, and 3-month Follow-Up*

I believe the physician...	Baseline (n=17)	Post (n=13)	Change from Baseline	Follow-up (n=13)	Change from Baseline
Used quality open-ended questions	94	100	+6	100	100
Used reflective listening statements	88	92	+4	95	95
Showed empathy	76	100	+24	100	100
Showed respect for my choices	59	75	+16	83	83
Gave good tailored advice to my needs	82	83	+1	83	83
Understood what I value in terms of my health	88	83	-5	92	92
Used a supportive approach	82	100	+18	100	+18

+ Numbers represent percent of standardized patients that agree with each statement as measured by a dichotomous Agree/Disagree scale

TABLE 5:

Resident Perceptions on the Effectiveness of the Training Program*

Statement	% Agree (n=13)
I believe the MI training was clear in explaining and demonstrating the principles and skills of motivational interviewing.	100
I believe the training was effective in preparing me to deliver MI to patients.	92
I am confident in my abilities to use MI elements when talking to patients as a result of the MI training.	77
The methods of MI from the training help me in my patient care.	69
I understand the principle rules of MI from the training.	100
I feel trained adequately to use MI in daily work.	92

+Numbers represent the percentage of residents that strongly agreed or agreed with each statement as measured by a 5 –point Likert scale

to make a lifestyle change. They had difficulty asking the patient quality open-ended questions, although they demonstrated good reflective listening skills. We learned that more individualized guidance and feedback from the instructor as s/he observed them in role-play scenarios would help the residents improve their skills and confidence in using MI.

A strength of the present study is that we used an objective and verifiable measure to assess the effectiveness of the training program on increasing skills in effective counseling techniques for chronic conditions. Previous studies have not included an objective measure, but have solely relied on self-reported experiences by the students. One limitation of this study is that standardized patients do not respond exactly as real patients would respond; the experience of these medical residents may have been different if they had worked with real patients, who may have presented more challenges. A second limitation is the small sample size (N = 13) of residents who completed the study. While the findings are useful as an initial, pilot-study, research on this topic is needed with a larger sample size of residents and in which a comparison group is utilized.

The findings from this study support the benefit of incorporating MI into the training of residents. Future studies should evaluate a feasible approach by which medical schools could incorporate MI concepts and strategies into the training of all students, including those in years 1 to 4. They should also evaluate the impact that use of MI by a medical resident or physician has on the health outcomes of patients, and not just the skill with which MI is used.

CONCLUSION

The majority of chronic disease is influenced by lifestyle behaviors, yet most physicians don't receive appropriate training to assist patients in making these appropriate behavioral changes. The evidence is clear that traditional methods of instructing patients to change their behavior do not lead to effective behavior change. Preliminary evaluation of the use of MI appears to enhance a clinician's skills in communicating with her or his patients and may achieve necessary behavior changes to improve health outcomes.

Training in MI in an early stage of medical education can enhance the clinician's skills to foster positive changes in the patient's lifestyle and health status. This may be an economical and efficient strategy to help patients change their behavior to prevent and/or reduce the impact of chronic disease on health care costs and the quality of life for a significant portion of the population.

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REVIEW ARTICLE

To Circumcise or Not to Circumcise

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Keywords:

Circumcision

Bioethics

Urology

Disease Prevention
& Wellness

Pediatrics

Abstract: This review article takes an evidence-based approach in the discussion of circumcision. International and national statistics are described to give context to the practice. The article reviews preventative health benefits of circumcision. There is also a summary of the bioethical reasons for and against circumcision and a short discussion of the research on the physiologic impact of removing the foreskin on sexual health. Complications of the procedure are reviewed. We discuss when to refer to a urologist and care of the uncircumcised penis. In conclusion, there are medical and ethical reasons to support circumcision but also plausible reasons to oppose it. Similarly to the American Academy of Pediatrics 2012 guidelines, we advocate discussion of these issues with concerned parents and helping them to make a decision based on medical, ethical, religious, and cultural beliefs.

INTRODUCTION

Male circumcision is a procedure to remove the foreskin of the penis. It is a surgery that has been present for millennia—for example, it was documented in Egyptian art dating from 2300 BC.¹ A number of contributing factors for male circumcision were identified by the World Health Organization (WHO) in 2010, such as religion, ethnicity, perceived social desirability, socioeconomic factors in some countries, and perceived health and sexual benefits.² The age at which the procedure is done varies greatly depending on the cultural and religious context.² Statistics may help to reflect the different influences on circumcision for family physicians who often have patients from different cultural and religious backgrounds.

According to WHO, 30% of males around the world are circumcised and approximately 69% of these are Muslim.² The most recent data published in 2013 from the Centers for Disease Control and Prevention (CDC) estimates the rate of circumcision in the United States at 80.5%.³ Within the United States, there is significant variation among ethnicities: male circumcision was seen in 90.8% of non-Hispanic whites, 75.7% in non-Hispanic blacks, and 44.0% in Mexican Americans.³ By contrast, most areas of Europe, Latin America, Russia, and East Asia have <20% prevalence of circumcision.²

WHO reported that religious male circumcision is primarily seen in Judaism and Islam and accounts for most male circumcisions globally. Approximately 30% of global male circumcisions are for nonreligious reasons.¹ In the United States, 75% of circumcisions are done for nonreligious reasons.¹

Historical reasons for a nonreligious circumcision include prevention of sexually transmitted diseases (STDs), as well as other, less well-established rationale, such as the prevention of masturbation and nocturnal enuresis.¹ Medical indications for circumcision include phimosis, irreducible paraphimosis, balanoposthitis, and balanitis xerotica obliterans.²

This paper presents an overview of foreskin anatomy and physiology, evidence-based overview of the possible medical, physiologic, and ethical advantages and disadvantages of circumcision. There is a discussion of the care of the uncircumcised penis for parents and patients and a review of emergencies that are unique to uncircumcised males.

Foreskin Anatomy & Physiology

What is the role of the foreskin, or prepuce? Perhaps surprisingly, there is no consensus on this issue.⁴ Lao and Raynor note that the innervation of the prepuce is different from the glans, and has somatosensory and autonomic innervation.⁴ Possibilities for the role of the foreskin include: protecting the moisture of the glans, protecting the fetal penis as it develops, or improving sexual pleasure.¹

What is known is that poor hygiene can cause the area under the foreskin to harbor bacteria and viruses.¹ The WHO 2007 report on circumcision discusses several ways that infections may occur.¹¹ Uropathogenic bacteria are able to adhere more easily to the type of skin under the foreskin and can proliferate and ascend in the urinary tract system.² Because the foreskin's inner mucosa is keratinized only thinly, it could be more easily damaged and allow entry of pathogens.³ Genital ulcers are more common in uncircumcised men and can provide a route of entry for HIV.⁴ The foreskin contains HIV-1 target cells, such as CD4+ T cells, macrophages, and Langerhans cells, so the cells are vulnerable to HIV infection.

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PREVENTATIVE HEALTH BENEFITS OF CIRCUMCISION

The position of WHO,² CDC⁵ and the American Academy of Pediatrics (AAP)⁶ on neonatal circumcision is that the preventative health benefits, such as decreasing STD transmission, penile cancer, and limiting balanitis, outweigh the risks. In particular, WHO recommends circumcision as part of a plan to reduce HIV transmission in heterosexual sex, citing a decreased risk of around 60%.⁷ These position papers also note that neonatal circumcision is relatively well tolerated with significantly fewer complications than when the procedure is done on older patients. Data on complication rates are presented in a later section.

In a review of the literature by Morris, Bailis, and Wiswell (2014),⁸ they note that 50% of uncircumcised males will have medical complications relating to their foreskin in their lifetimes. The possible complications range from the relatively simple, like balanitis, to the potentially fatal, like penile cancer or HIV (see Table 1). A 2009 Cochrane Review indicated that there was strong evidence for male circumcision for the prevention of HIV in heterosexual sexual encounters.⁹ However, there was no association between circumcision and the prevention of HIV acquisition with homosexual sexual encounters.¹⁰ Of note, generally urinary tract infections in infants are associated with greater severity, including pyelonephritis and sepsis, and with potential problems later on, such as renal scarring.¹¹

Female partners of uncircumcised men are also more likely to acquire cervical cancer (2.4-fold), chlamydia (5.6-fold), HSV type 2 (2.2-fold), trichomonas (1.9-fold), and bacterial vaginosis (1.4-fold).⁸

There is controversy among some laypeople, bioethicists,¹² and some medical professionals^{13,14} about the preventative health benefits of circumcision, which is discussed further in a following section (Ethics of Circumcision).

POTENTIAL REASONS NOT TO CIRCUMCISE

Within the past few decades, there has been a growing international movement of laypeople, bioethicists, and medical professionals against neonatal and infant circumcision, also known as “intactivists.”¹³ There are several arguments that they use to argue against circumcision, including potential future sexual side effects and ethical questions.^{21,22} This group has a very strong Internet presence but also has been driving legislation. In 2011, there was a proposed ballot measure to outlaw male circumcision in San Francisco and, in response, California Governor Jerry Brown signed a bill to prevent local governments from banning it.²³ In 2012, a Higher Regional Court in Cologne, Germany, ruled that male religious circumcision was considered “bodily harm” and the physician who had done the circumcision was brought to trial.²⁴ The physician was acquitted but the case caused a furor from Jewish and Muslim groups. In response, in 2013, the Bundestag, or German Parliament, passed a law that allowed circumcision for religious reasons.²⁴ After another case in 2013 involving a boy of part-Kenyan heritage, the German court ruled that parents can make the decision for circumcision if the boy cannot make such a decision himself. Otherwise, the boy would have to be informed about the procedure in an age-appropriate fashion and his wishes considered.²⁴

TABLE 1:

Relative risk of uncircumcised males to acquire disease as compared to circumcised males and the incidence rates with a given disease.

Disease	Relative Risk in Uncircumcised Males ⁸	Rate or % of Male Population in US with Disease
Balanitis	3.1	1% ¹⁵
UTI <1 year old	9.9	2.7% ¹⁶
UTI over lifetime	3.6	1-2% ¹⁷
HIV through heterosexual sex	2.4	83 ^{18*}
High risk HPV	1.5-2.7	(25.1% ^{19*})
Syphilis	1.9	9.8 ²⁰
Penile cancer	>20	0.69 ⁴²

**Calculated by taking the population of HIV patients in the United States in 2010 (1.1 million) and multiplying by reported percentage of men with HIV (76%), resulting in 836,000 men with HIV. This paper quoted 69% of these males were men who have sex with men, so the percentage of men with HIV who had heterosexual encounters was calculated to be 31%. 836,000 was multiplied by 31%, resulting in 259,160 men with HIV who were practicing heterosexual sex. This was then divided by the population of the United States in 2010 (309.3 million) and multiplied by 100,000.*

^Percentage of 1868 men in study by NHANES

Because of the strong Internet presence of intactivists, parents will likely come in with some of these issues in mind when discussing circumcision with their family’s physicians. We will address the arguments on ethics and physiology below. Preventative medicine was discussed in the previous section.

Ethics of Circumcision

There have been a wide variety of bioethical opinions to neonatal and infant male circumcision and it has been the subject of many articles in bioethical journals (e.g., there was an entire issue dedicated to this question in the Journal of Medical Ethics, July 2013). A sample of opinions is represented below.

Bioethicists Svoboda, Adler, and Van Howe view the AAP and CDC guidelines as being flawed.¹² The authors review the Cardinal Ethical Rules of autonomy (self-determination), non-maleficence (not doing harm), beneficence (doing good), and justice (fairness). They state that because the parents make a decision about removing a part of the male’s sexual organ without his consent, neonatal or infant circumcision violates autonomy. With regards to non-maleficence, the authors argue that there have not been any proven substantial benefits specifically regarding UTIs, HIV, and penile cancer, so circumcision violates this ethical rule.

Another argument is that “there are no medical indications for male circumcision in the neonatal period,” so neonatal circumcision violates the rule of beneficence.¹¹ The authors analyze specific ethical rules from the American Medical Association, such as no unnecessary surgery, equality, a physician’s duty is to the patient, and ethical preventative medicine and argue that male circumcision violates these rules as well. For example, equality is violated because females are protected against female circumcision, or female genital mutilation, while males are not. They state that physicians are not respecting their male patients’ health and well being in this matter. The authors point out that medical associations from other countries (such as Denmark, Sweden, and South Africa) have called for bans on infant male circumcision as violations of human rights and medical ethics.

Other bioethicists hold opposing views, such as Benatar and Benatar.²⁵ They note that despite the varying quality of medical research on UTIs, it is important that the available data points to circumcision improving preventative health. Their major caveat is the practice of not using anesthesia during circumcision when it is easy to administer and decreases pain in the patient. Their conclusion is that “nontherapeutic circumcision of infant boys is a suitable matter for parental discretion. In exercising that discretion, religious and cultural factors, though preferably subject to critical evaluation, may reasonably play a role.”²⁵

Brady²⁶ discusses a study done by Sansom, Prabhu, Hutchinson, et al. that modeled an American male’s lifetime risk of HIV if circumcised at birth, based on the HIV incidence of circumcised men in three randomized controlled trials in Africa.²⁷ These authors found that in this model, circumcision reduced the lifetime risk of acquiring HIV among all American males by around 16%, varying by ethnicity. Brady also notes that if male circumcisions were done at the consenting age of 18 years old, the procedure would be more complicated with a higher risk of adverse events (as noted above) and there would be an increased risk of sexually transmitted disease, given that 47% of high school seniors acknowledge sexual activity and 24% reported four or more sexual partners. Brady posits that it is ethical for parents to make an informed medical decision on what they felt was most beneficial for their child, based on medical advice, culture, and parents’ experience—the way many decisions are already made.

Morris, Bailis, and Wiswell⁸ argue that the United Nations Convention on the Rights of the Child allows for parents to authorize procedures in their children’s best interests. Because of the body of evidence for the health benefits of circumcision, these authors argue that neonatal and infant circumcision is ethical and in boys’ best interests.

The British Medical Association (BMA) views non-therapeutic male circumcision to be lawful if it “is performed competently, believed to be in the child’s best interests, and there is valid consent.”²⁸ Regarding the issue of consent, the BMA states that competent children should be involved in the decision making process and that if the parents disagree, the procedure should not be done without a court order.

Research on Foreskin Sexual Physiology

There has been controversy about the role of the foreskin in sexual pleasure. Individual studies have looked at physiologic responses to stimulation and qualitative data, and have had mixed results. A systematic review from Morris and Krieger looked at whether circumcision affected the experience of sex as measured by sexual function (performance, erectile dysfunction, premature ejaculation, ejaculatory latency time, orgasm difficulties, and dyspareunia), sensitivity (touch perception of a flaccid penis), sensation (neurophysiologic perception of the penis or portion of the penis during sexual stimulation), and satisfaction (patient-reported pleasure and patient-reported orgasm intensity).²⁹ In their review, the high quality studies showed that circumcision had no effect on sexual function in these parameters. Two large randomized controlled trials were done in Kenya and Uganda. In the Kenyan study, 2,784 men were involved.³⁰ The group that was randomized for circumcisions were given questionnaires before and after circumcision at 6-month intervals until two years after the circumcision. The other group was given the questionnaires at the same intervals. At two years after circumcision, 99.9% of respondents were satisfied with the procedure. Circumcised participants had increased penile sensation in 71.8% and increased ease of reaching orgasm in 63.1%. In the Ugandan study, 2,246 men were uncircumcised and another 2,210 were randomized to receive circumcisions. There was no difference between the two groups in medium/high level of sexual desire, difficulty in achieving or maintaining an erection, difficulty with vaginal penetration, difficulty with ejaculation, or dyspareunia. Both groups had an equal level of sexual satisfaction at one and two years after one group had the circumcision. Morris and Krieger also take note of a national survey of 1,410 men in the US, aged 18-59 years old, that found that sexual dysfunctions were more common among uncircumcised men.³¹ A similar telephone study was conducted in Australia, with circumcised men noting less sexual dysfunction for a month or more in the previous year.³²

Another systematic review and meta-analysis by Tian, Liu, Wang, et al. found no differences between circumcised and uncircumcised men in sexual desire, dyspareunia, premature ejaculation, ejaculation latency time, erectile dysfunctions, and orgasm difficulties.³³

Because of the emphasis that intactivists place on the integrity of the foreskin for sexual pleasure, there are also men who attempt to “restore” the foreskin.³⁴ This can be done with nonsurgical methods using gentle traction with weights or, rarely, surgical reconstruction.

MEDICAL COMPLICATIONS ASSOCIATED WITH CIRCUMCISION

Providers performing neonatal circumcisions are familiar with the standard complications: bleeding, infection, and cosmetic injury or amputation of the glans. There are also grave complications that can develop, such as bacteremia and death from life threatening infections or profound blood loss.

Awareness of the penile anatomy, understanding of the equipment, and appropriate training can reduce many of the medical complications. An international review on neonatal and infant circumcision complications in prospective studies by WHO in 2010² noted that “the median frequency of any adverse effect was 1.5% (range of 0-16% among 16 studies) and the median frequency of

any severe adverse effect was 0% (range of 0-2%).² The circumcision approaches varied from using the Plastibell or the Gomco clamp to freehand circumcision or a combination, and were done by medical professionals (physicians, nurses, or midwives) or traditional practitioners. The most common adverse events were minor, such as swelling, bleeding, or inadequate removal of skin. There were rare serious adverse events, such as amputation of the glans penis if the glans is not protected.

The rate of complications depends on timing of the procedure and the method used to perform the circumcision (Table 2).

Other complications can develop later. These include epidermal inclusion cysts, suture sinus tracts, chordee, inadequate skin removal resulting in redundant foreskin, penile adhesions, phimosis, buried penis, urethrocutaneous fistulae, meatitis, meatal stenosis.³⁵ Many of these complications can be easily handled in the outpatient setting without a urology consultation. A later section will offer more details on when to refer to a urologist.

With the increasing age of the infant, there appears to be increased pain from circumcisions. Most literature reports that any circumcision performed before the 4th week of life is generally well tolerated. A study in 2009, 36 of 583 infants found that 6.5% infants under 1 week of life experienced pain at a rating of >=2 during circumcision, using the Neonatal/Infant Pain Scale (NIPS; Table 3). However, 100% of infants at 4 weeks of life experienced this rating during circumcision.

During circumcision, pain in the newborn younger than 4 weeks of age is typically controlled by performing a dorsal nerve block with 1% lidocaine and providing the infant with dextrose water. Bleeding is generally controlled with gentle pressure and, less commonly, with chemical cautery, Surgicel®, or sutures. If bleeding cannot be controlled, surgical correction may be necessary.

Circumcision done after infancy is more likely to require sutures for hemostasis and have a higher rate of complications even for those done by medical professionals in sterile circumstances.² WHO reported 10 prospective studies of complications for circumcisions done by medical professionals on boys one year or older. For these studies, “the median frequency of any adverse event

was 6% (range 2-14%), and the median frequency of any serious adverse event was 0% (0-3%).² The authors note that adverse events were most common among boys who had the circumcision done for medical reasons, which would likely be more complicated surgical cases than if the circumcisions were for non-therapeutic reasons. Complications in circumcisions that were done by non-medically trained professionals, often in non-sterile conditions, had a higher rate of adverse events with more serious complications. One study conducted in Turkey had 407 subjects who were circumcised at two mass circumcision events.³⁷ The average age was 7 years old and the circumcisions were done by non-medical professionals in a non-sterile environment. 73% of participants had complications, including infections, subcutaneous cysts, and bleeding that needed suturing for hemostasis. Five boys required hospitalization for infections.

TABLE 3:

Neonatal/Infant Pain Scale (NIPS)³⁶
 *Maximum score of 7.

N/IPS*	0	1	2
Facial expression	Relaxed	Contracted	
Cry	Absent	Mumbling	Vigorous
Breathing	Relaxed	Different than basal	
Arms	Relaxed	Flexed/ stretched	
Legs	Relaxed	Flexed/ stretched	
Alertness	Sleeping/ Calm	Uncomfortable	

TABLE 2:

Types of complications with different methods³⁵

Type	Mogen	Gomco	Plastibell
Complication	1. insufficient or excessive skin removal 2. Asymmetric redundancy 3. Amputation of the glans *All due to incorrect placement of the clamp	1. Insufficient or excessive skin removal 2. Increased bleeding rates if not properly tightened *All due to technical factors with placement of the 4 piece clamp	1. Incomplete circumcision 2. Glans injury 3. Bleeding * Inadequate bell placement or slippage or inadequate hemostatic suture position

WHEN TO REFER FOR CIRCUMCISION BY A UROLOGIST

Most newborn or infant circumcisions under the age of 30 days can safely be performed in the hospital prior to discharge or in the outpatient setting. However, there are contraindications to this. When penile anomalies are present, it is necessary to refer to an urologist for assessment and management. The anomalies encountered more frequently include epispadias, hypospadias, congenital buried penis, hooded prepuce, penile curvature, penile torsion, and penoscrotal webbing.

GENERAL CARE & RECOMMENDATIONS OF THE UNCIRCUMCISED MALE

The uncircumcised infant should require no extra care. Simply washing the area during baths with gentle soaps and observing for any signs of redness or edema is sufficient. Forcible retraction in infancy is not indicated and could cause harm.³⁸ It is also not recommended to retract when the child is immersed in bathwater as the bathwater could contain *E. coli* and other enteric bacteria.

Self-exploration and nocturnal erections begin around the age of two and a parent can begin gently retracting the foreskin to clean the smegma exposed once adhesions are broken down. Gentle soap and water are used to clean the foreskin and, after retraction, the glans. Make certain to dry the area before replacing the foreskin into its anatomical position. Not replacing the foreskin properly can lead to paraphimosis, a urologic emergency (see following section). As the male child grows, it is important to teach him to perform this action as part of his daily or every other day hygiene habits. Typically once a child has undergone puberty they can be taught to perform the steps listed above as part of their own hygiene routine without adult supervision.³⁹

UNCIRCUMCISED PROBLEMS OR EMERGENCIES

Phimosis is the inability to retract the foreskin and is commonly described as physiologic or pathologic. Physiologic phimosis is most commonly seen in infants due to the normal development of congenital adhesions. If this condition continues into childhood, gentle stretches and appropriate hygiene education should be provided. Physiologic phimosis is seen in 10% of children 3 years of age.³⁸ Only 1% at the age of 16 years will be unable to retract the foreskin.³⁸

Patients with pathologic phimosis often present with a non-retractable foreskin due to scarring at the distal foreskin, which is usually caused by trauma, infection, or inflammation. The incidence rate of pathologic phimosis is 0.4 in 1000 boys per year.⁴⁰ The associated symptoms include dysuria, irritation and bleeding, painful erections, and dyspareunia.⁴⁰

With either physiologic or pathologic phimosis, application of a steroid cream can assist in breaking down adhesions. The most commonly used steroids are betamethasone cream (0.05%), triamcinolone cream (0.1%), hydrocortisone (2.5%), or fluticasone propionate (0.05%) twice daily at the prepuce opening for 4-8 weeks, along with gentle stretching techniques to assist in retracting the foreskin.^{38,40}

Balanitis is the most common inflammatory condition of the glans and balanoposthitis is the most common inflammatory condition of the combined glans and foreskin. Both can lead to pathologic phimosis and, potentially, paraphimosis. This chronic inflammation is caused by poor hygiene complicated by a secondary infection. The patient may present with a swollen and inflamed foreskin and/or glans penis with associated purulent drainage. Aerobic, anaerobic and fungal organisms can be associated with these conditions, so culture of the drainage is needed.⁴¹ Oral antibiotic and topical antifungal treatments are indicated until cultures return and more focused treatment can begin.⁴¹

Paraphimosis, on the other hand, is a urologic emergency. Paraphimosis occurs when the foreskin is left retracted and swelling develops. This swelling leads to impaired venous and lymphatic flow of the glans, which then leads to arterial compromise and potentially necrosis of the glans penis if left untreated. The cause of paraphimosis is often not replacing the foreskin over the glans into the normal anatomic position after cleaning or voiding, urethral catheter placement, or a vigorous sexual encounter during adolescence or adulthood.⁴¹ It may also occur with foreskin and penile piercings.⁴¹ There is significant pain and edema associated with this condition and patients require intravenous analgesia and potentially adjuncts to reduce edema, such as topical NSAIDs, while preparing for reduction or surgical corrective measures.⁴¹ Paraphimosis can often be reduced, if no necrosis is observed, with pressure to the glans to remove excess edema while pulling the foreskin over the glans.³⁸ If this technique is unsuccessful then a dorsal slit under anesthesia may need to be performed and a circumcision will likely follow.³⁸ If penile or foreskin necrosis is present, urgent urologic consultation is warranted.

CONCLUSION

There are cogent arguments for and against circumcision. On the medical side, there are decreased risks for severe UTI in the first year of life, as well as lowered risks of foreskin related diseases, such as balanitis. There is evidence for the physiology of the foreskin leading towards a higher rate of sexually transmitted illnesses. On the ethical side, doing circumcisions in the first month of life leads to a simpler, better tolerated procedure with fewer complications, and can help prevent foreskin related problems during a male's lifetime.

From the opposing viewpoint, 70% of the men in the world are uncircumcised. The high prevalence in the United States appears to be from cultural, rather than medical or religious, reasons. Many of the medical problems that are foreskin related are relatively rare (UTI) or extremely rare (penile cancer). For other diseases, such as HPV, while circumcision is helpful to prevent transmission and contracting the disease, appropriate use of condoms and immunization against high-risk types of HPV are likely more effective. Ethically, doing a procedure for non-religious and non-medical reasons that permanently alters the appearance of genitalia could be considered problematic.

Importantly, there is not much research that demonstrates a decrease in sexual effects after circumcision. Based on systematic reviews and meta-analyses as well as studies of physiology, the evidence seems to lean towards no change after circumcision or even slightly improved sexual experiences.

The authors take a similar stand as the AAP 2012 guidelines and advocate discussion of these issues with concerned parents and helping them to make a decision based on medical, ethical, religious, and cultural beliefs.

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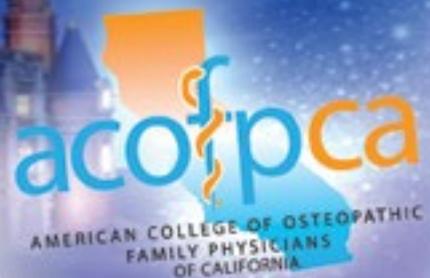
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REVIEW ARTICLE

Ethical Considerations in Prescribing or Withholding Opioids for Chronic Pain

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Keywords:

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Abstract: Pain is among the most common reasons that patients seek help from their physicians in the United States: it is estimated that chronic pain results in up to \$635 billion per year in health care costs and lost productivity.

The management of chronic pain is complex and can be problematic for many clinicians, as pain is a subjective complaint. It may present out of proportion to the severity of a patient's injury, or it can present without any objective findings at all. Based on past experiences, some clinicians may be overly restrictive in their prescribing of opioids, which may prevent some patients with legitimate pain from receiving appropriate therapy.

As the number of people suffering from chronic pain has risen over the past few decades, so has the number of opioid prescriptions, and this has not come without consequences. Opioid dependence and addiction has increased, and poor opioid prescribing practices and opioid diversion has resulted in the non-medical use of pain relievers by an estimated 25 million people from 2002-2011.

Despite the prevalence of patients that suffer from chronic pain, very few physicians are formally trained in pain management. A reasonable ethical approach for all physicians is to seek guidance from the 4 basic bioethical principles – beneficence, non-maleficence, justice and autonomy – in order to identify the ethical challenges of employing opioids in the management of chronic pain.

INTRODUCTION

Pain is among the most common reasons that patients seek help from their physicians in the United States, which is not surprising considering that approximately 25 million Americans suffer from acute pain.¹ An additional 100 million individuals in the United States suffer from chronic pain, and it is estimated that chronic pain results in up to \$635 billion per year in health care costs and lost productivity.²

The management of chronic pain is complex and can be problematic for many clinicians. Pain, especially in a chronic setting, is a subjective complaint. It may present out of proportion to the severity of a patient's injury, or it can present without any objective findings at all. Because of this, a physician must rely solely on the patient's narrative to assess pain and its impact on the patient's ability to have a meaningful and productive life. Based on past experiences, some clinicians may be overly restrictive in their prescribing of opioids, which may prevent some patients with legitimate pain from receiving appropriate therapy. For many reasons, physicians may

be hesitant to prescribe medications with potential for misuse or because of fear of side effects or not having received proper education.³

When initial measures of pain management, such as non-steroidal anti-inflammatory agents or calcium channel ligands like gabapentin, fail, many physicians turn to opioid analgesics to provide pain relief for their patients. Consequently, as the number of people suffering from chronic pain has risen over the past few decades, so has the number of opioid prescriptions. In 2013, over 240 million prescriptions for opioid analgesics were dispensed in the United States.⁴ This has not come without consequences. The number of medical emergencies related to legally prescribed opioids increased 183% between 2004 – 2011, and there were almost 17,000 deaths due to prescription opioid overdose in 2010.⁵ Opioid dependence and substance use disorders have increased, and poor opioid prescribing practices and diversion have resulted in the nonmedical use of pain relievers by an estimated 25 million people from 2002-2011.

Despite the prevalence of patients that suffer from chronic pain, very few physicians are formally trained in pain management. A reasonable ethical approach for all physicians is to seek guidance from the 4 basic bioethical principles – beneficence, non-maleficence, justice and autonomy – in order to identify the ethical challenges of employing opioids in the management of chronic pain.

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ETHICAL CONSIDERATIONS

Beneficence

The principle of beneficence states that a physician should seek to help patients by implementing clinical therapies that benefit the health of the patient. Physicians are committed to helping patients, and pain relief is no exception. The effects of opioids are well known to physicians. These medications provide analgesia by binding to mu opioid receptors in parts of the brain that regulate pain perception.⁶ Opioid analgesics are capable of providing the immediate relief of pain, which has an obvious benefit in an acute setting. However, data is lacking for the effectiveness of long-term opioid therapy in treating chronic pain. While there is a growing body of evidence that opioids are effective in improving pain and allowing patients to return to a meaningful, productive life,¹ there have been no well-designed studies published of treatment regimens lasting longer than 16 weeks.⁷

- A physician may be inclined to provide opioid prescriptions to a patient after careful, thorough, and proper evaluation of the benefits such medication may provide the patient. Non-pharmacological therapies which have been proven to be safe and effective in the management of chronic pain, such as osteopathic manipulative treatment (OMT), acupuncture, physical therapy, etc, should be considered as options as well.
- If a physician has not received training, or feels unqualified to personally prescribe opioids for patients, he or she should help the patient by referring the patient to specialist for management of the chronic pain.

Non-maleficence

The principle of non-maleficence requires that physicians do not intentionally cause harm to their patients, and most physicians will recognize this principle in the familiar maxim *primum non nocere*: “Above all, do no harm.”⁸ This principle is of particular concern to physicians considering the use of opioids for chronic pain, due to the risks and dangers of prescription opioid medications.

The same mu receptors that are responsible for the analgesic effects of opioids are also responsible for their addictive properties and dangerous side effects. Physicians must balance treating a patient’s pain, avoiding substance use disorder, and addressing tolerance to the medication. While developing a substance use disorder is a possibility when using opioid drugs, tolerance and physical dependence are inevitable. Physicians should understand that a patient who has become tolerant to their current opioid dose might demonstrate behaviors indistinguishable from drug-seeking behaviors of those with substance use disorders. Physicians must carefully screen for substance use disorder, and ensure that patients in legitimate need of increases or modifications of their opioid therapy are not being undertreated.

- As part of avoiding patient harm, physicians must be sure to avoid causing dangerous side effects through judicious evaluation of the patient, as well as consideration of other medications and therapies, which may help the patient with less risk than opioid therapy. The prescriber should consider indications for the use of opioids, and not freely prescribe for all types of patient pain.

- In August 2016, as a response to the nation’s prescription opioid crisis, for the first time, the United States Surgeon General sent a direct mailing to over 2 million clinicians in the United States asking for their help in addressing this issue. The mailing included a pocket card, which contains guidelines from the Centers for Disease Control and Prevention for prescribing opioids (*Figure 1, page 28*).
- The best way to treat substance use disorder is to prevent it in the first place.

Justice

The principle of justice requires that like patients be treated alike. This requires physicians provide similar care, regardless of physical location (of doctor or patient) or personal bias. Previous studies suggest that patients who access pharmacies in minority areas are more likely to find that the pharmacy does not carry a sufficient supply of opioids for the treatment of their pain, in contrast to pharmacies in primarily Caucasian neighborhoods. This creates a medication desert, where patients with legitimate pain are unable to obtain relief due to reasons beyond their control. Physicians should work with the patient to make sure the patient is able to access their medications, and if the patient is having difficulty, the clinician should attempt to assist the patient to find out which pharmacy will have the medications.^{9,10}

Physicians should be aware of their own potential for bias in the treatment of their patients. Black patients have been shown in the past to be less likely to receive opioids than white patients, after controlling for other factors. By keeping in mind the osteopathic philosophy of treating each patient as a whole, and taking the time to properly assess each patient’s unique situation, physicians may be able to mitigate this bias.¹¹

Autonomy

The principle of autonomy illustrates the right of patients to make educated decisions in regards to their own healthcare.¹¹ This has become a prevalent aspect of medical ethics, as the relationship between doctor and patient has shifted to a combined decision-making model.¹³ However, the physician and patient may have differences in opinion for the patient’s treatment plan. Consider the scenario of a new patient who has been taking opioids for years for chronic, nonmalignant low back pain. The physician may advise the patient that the physician does not prescribe opioids for chronic nonmalignant pain. The patient perspective may be that the patient’s previous prescriber gave the patient an effective therapy, and they wish to stay on that rather than try another modality. Without clear communication of treatment goals, expectations, and a willingness to be open, neither party may leave the encounter happy. Both sides may have conflict and difficulty in coming to an agreement on the best treatment.

CONSIDERATIONS FOR THE OSTEOPATHIC PHYSICIAN

Although the 4 basic principles of bioethics serve as a framework for identifying the ethical issues regarding the use of prescription opioids in chronic pain, there is no universal method for decision-making when conflicts among these principles arise.¹⁴ Osteopathic physicians might then turn to the principles and philosophy of

FIGURE 1:



PRESCRIBING OPIOIDS FOR CHRONIC PAIN

ADAPTED FROM CDC GUIDELINE
Opioids can provide short-term benefits for moderate to severe pain. Scientific evidence is lacking for the benefits to treat chronic pain.

IN GENERAL, DO NOT PRESCRIBE OPIOIDS AS THE FIRST-LINE TREATMENT FOR CHRONIC PAIN (for adults 18+ with chronic pain > 3 months excluding active cancer, palliative, or end-of-life care).

BEFORE PRESCRIBING

1 ASSESS PAIN & FUNCTION
Use a validated pain scale. Example: PEG scale where the score = average 3 individual question scores (30% improvement from baseline is clinically meaningful).
Q1: What number from 0 – 10 best describes your PAIN in the past week? (0 = "no pain", 10 = "worst you can imagine")
Q2: What number from 0 – 10 describes how, during the past week, pain has interfered with your ENJOYMENT OF LIFE? (0 = "not at all", 10 = "complete interference")
Q3: What number from 0 – 10 describes how, during the past week, pain has interfered with your GENERAL ACTIVITY? (0 = "not at all", 10 = "complete interference")

2 CONSIDER IF NON-OPIOID THERAPIES ARE APPROPRIATE
Such as: NSAIDs, TCAs, SNRIs, anti-convulsants, exercise or physical therapy, cognitive behavioral therapy.

3 TALK TO PATIENTS ABOUT TREATMENT PLAN

- Set realistic goals for pain and function based on diagnosis.
- Discuss benefits, side effects, and risks (e.g., addiction, overdose).
- Set criteria for stopping or continuing opioid. Set criteria for regular progress assessment.
- Check patient understanding about treatment plan.

4 EVALUATE RISK OF HARM OR MISUSE. CHECK:

- Know risk factors: illegal drug use, prescription drug use for nonmedical reasons; history of substance use disorder or overdose; mental health conditions; sleep-disordered breathing.
- Prescription drug monitoring program data (if available) for opioids or benzodiazepines from other sources.
- Urine drug screen to confirm presence of prescribed substances and for undisclosed prescription drug or illicit substance use.
- Medication interactions. AVOID CONCURRENT OPIOID AND BENZODIAZEPINE USE WHENEVER POSSIBLE.

WHEN YOU PRESCRIBE

START LOW AND GO SLOW. IN GENERAL:

- Start with immediate-release (IR) opioids at the lowest dose for the shortest therapeutic duration. IR opioids are recommended over ER/LA products when starting opioids.
- Avoid > 90 MME/day; consider specialist to support management of higher doses.
- If prescribing ≥ 50 MME/day, increase follow-up frequency, consider offering naloxone for overdose risk.
- For acute pain: prescribe < 3 day supply; more than 7 days will rarely be required.
- Counsel patients about safe storage and disposal of unused opioids.

See below for MME comparisons. For MME conversion factors and calculator, go to TurnTheTideRx.org/treatment.

<p>50 MORPHINE MILLIGRAM EQUIVALENTS (MME)/DAY:</p> <ul style="list-style-type: none"> • 50 mg of hydrocodone (10 tablets of hydrocodone/acetaminophen 5/300) • 33 mg of oxycodone (~2 tablets of oxycodone sustained-release 15mg) 	<p>90 MORPHINE MILLIGRAM EQUIVALENTS (MME)/DAY:</p> <ul style="list-style-type: none"> • 90 mg of hydrocodone (18 tablets of hydrocodone/acetaminophen 5/300) • 60 mg of oxycodone (4 tablets of oxycodone sustained-release 15mg)
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AFTER INITIATION OF OPIOID THERAPY

ASSESS, TAILOR & TAPER

- Reassess benefits/risks within 1-4 weeks after initial assessment.
- Assess pain and function and compare results to baseline. Schedule reassessment at regular intervals (≤ 3 months).
- Continue opioids only after confirming clinically meaningful improvements in pain and function without significant risks or harm.
- If over-sedation or overdose risk, then taper. Example taper plan: 10% decrease in original dose per week or month. Consider psychosocial support.
- Tailor taper rates individually to patients and monitor for withdrawal symptoms.

TREATING OVERDOSE & ADDICTION

- Screen for opioid use disorder (e.g., difficulty controlling use; see DSM-5 criteria). If yes, treat with medication-assisted treatment (MAT). MAT combines behavioral therapy with medications like methadone, buprenorphine, and naltrexone. Refer to findtreatment.samhsa.gov. Additional resources at TurnTheTideRx.org/treatment and www.hhs.gov/opioids.
- Learn about medication-assisted treatment (MAT) and apply to be a MAT provider at www.samhsa.gov/medication-assisted-treatment.
- Consider offering naloxone if high risk for overdose: history of overdose or substance use disorder, higher opioid dosage (≥ 50 MME/day), concurrent benzodiazepine use.

ADDITIONAL RESOURCES

CDC GUIDELINE FOR PRESCRIBING OPIOIDS FOR CHRONIC PAIN:
www.cdc.gov/drugoverdose/prescribing/guideline.html

SAMHSA POCKET GUIDE FOR MEDICATION-ASSISTED TREATMENT (MAT):
store.samhsa.gov/MATguide

NIDAMED: www.drugabuse.gov/nidamed-medical-health-professionals

ENROLL IN MEDICARE: go.cms.gov/peccs
Most prescribers will be required to enroll or validly opt out of Medicare for their prescriptions for Medicare patients to be covered. Delay may prevent patient access to medications.

JOIN THE MOVEMENT
of health care practitioners committed to ending the opioid crisis at TurnTheTideRx.org.





osteopathy to guide them in making decisions related to prescribing opioids for chronic pain, especially the two principles listed below:

- Emphasis on prevention
- Treating the patient as a whole

Some patients seek out osteopathic family physicians due to their past experiences with DO's who provided care for the whole family, as well as performed OMT. Past studies have demonstrated that OMT is efficacious in the treatment of pain and improving functional status.^{15,16}

Prevention of future problems is also an ideal way to avoid the need for narcotics. Patients should be encouraged to maintain healthy lifestyles, with attention to a balanced diet and regular physical activity, starting at a young age.

Studies have shown that depression and pain are intricately linked, with patients suffering from depression experiencing less pain reduction in treatment studies compared to patients without depression.¹⁷ Patients being assessed for pain should be asked about signs and symptoms of mood disorders, both of which are crucial in the biopsychosocial model of pain, as well as any stressors in the workplace or at home. Physicians should learn how pain affects each aspect of the patient's life such as the patient's work, finances, relationships, and spiritual practices, and strive to set realistic goals for improvements in pain and its adverse effects.

For those patients who do have chronic pain, consideration should be given to non-pharmaceutical modalities, such as OMT, acupuncture, physical therapy, and other modalities – either discretely, or in conjunction with medications. Osteopathic physicians should work with patients, and the patients' families, to set clear goals and expectations. Together, physician and patient should create a pain contract that includes not only the expectations the physician has of the patient regarding medication use and participation in non-pharmaceutical treatment options, but also the patient's expectations of the physician's commitment to managing the patient's pain. Both parties should sign and keep a copy of this contract, which clearly states these expectations.

CONCLUSION

All physicians have a moral obligation to assist patients in need - patients suffering from chronic pain included. While the care and associated policy restraints differ for a patient suffering from sickle cell anemia pain when compared to a patient needing an emergency appendectomy, both patients have medical needs to be addressed. It is the job of the physician to work with the patient in order to understand the symptoms and underlying causes. Just as with any illness, a physician must educate the patient regarding the condition and the available intervention options, while carefully weighing the risks and benefits of all those options. Together, the patient and the provider create a treatment plan.

Chronic pain responds best to a multidisciplinary approach. Fortunately, osteopathic physicians are uniquely qualified to address chronic pain for their patients. Prevention of pain, thorough assessment of a patient's physical, social, and mental health, knowledge and use of OMT (in addition to other adjunctive therapies),

and the focus on treating the whole patient are all core elements of practicing medicine as an osteopathic physician. These skills and approaches will be beneficial to both physician and patient when facing issues of chronic pain.

Further, if opioids are in fact needed, the medication can effectively be used while respecting the obligations of both parties to prevent misuse and diversion of opiates.

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REVIEW ARTICLE

Sleep Disorders & Treatment

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Keywords:

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& Treatment

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& Wellness

Abstract: Sleep disorders are a common complaint in the primary care setting and have important medical and social consequences. Diagnosis can usually be made through history and physical. Polysomnography is useful for the diagnosis of obstructive sleep apnea and limb movement disorders. Insomnia is the most common sleep disorder and numerous treatment options are available. Non-pharmacologic treatment of insomnia is the preferred first line treatment. Circadian rhythm sleep disorders are a shift in the normal timing of a 24 hour sleep wake cycle and standard treatment include melatonin and bright light therapy. Obstructive sleep apnea is characterized by repeated episodes of apnea and should be diagnosed by in home or in lab sleep study. Standard treatment is with CPAP or an oral appliance. Sleep behavior disorders can be classified as occurring during REM sleep or non REM sleep. Treatments depend on the disorder, but supportive care such as a safe sleep environment are crucial. Daytime sleepiness disorders include narcolepsy and idiopathic hypersomnia, both are treated with stimulants to increase wakefulness. Sleep movement disorders include restless leg syndrome and periodic limb movement disorder. RLS is associated with low ferritin and can be readily treated with iron or other specific medications. Sleep bruxism is best treated with a dental device to protect the teeth from damage.

INTRODUCTION

Sleep disorders are conditions that disrupt the normal quality and pattern of sleep for patients and are very common in the general population. Using a good history, physical exam and selected diagnostic testing, sleep disorders can also be well managed by the family physician. Sleep disorders account for a significant number of outpatient visits, with any sleep disturbance accounting for over 12.1 million visits in 2010 according to NHANES 1999-2010.¹ Similarly visits related to sleep apnea and sleep related breathing disorders rose 400% in the same survey, accounting for 5.8 million visits. The direct and indirect costs associated with sleep disorders are substantial, with the direct costs of the treatment but the majority of costs related to work absenteeism and lower productivity.²⁻³ Health impacts of sleep disorders are well documented with numerous associations effecting every organ system. A growing body of research points to inadequate sleep implicated in the risk of diabetes, coronary artery disease, hypertension and weight gain.⁴⁻⁷ Inadequate sleep is also associated with decreased alertness, memory impairment, and occupational injury and is implicated in a significant proportion of motor vehicle accidents.⁸⁻¹² Currently medical education is being transformed by new research on the effects of sleep deprivation on alertness leading to reduced work hours for medical residents, with the resultant educational outcomes yet to be evaluated.¹³⁻¹⁵ In all, sleep disorders and sleep deprivation pose a significant social and medical burden. For the purpose of this review, sleep disorders will be categorized into six

areas, insomnia, circadian rhythm disorders, sleep related breathing disorders, sleep movement disorders, sleep behavior disorders and daytime sleepiness disorders.

HISTORY & PHYSICAL EXAMINATION

As with any disorder, evaluation starts with a good history and physical examination. The importance of a reliable history regarding sleep can often lead to accurate diagnosis without excessive diagnostic testing. The American Academy of Sleep Medicine joint consensus statement on sleep duration, recommends that the average adult should get between 7-9 hours of sleep per night.¹⁶ Ideally this would be continuous uninterrupted sleep, although the historical record would indicate that uninterrupted sleep at night is a relatively new phenomenon and that sleep at night need not be continuous to be considered adequate.^{17,18} Sleep duration less than 6 hours is associated with several deleterious health effects, and interestingly, sleep duration of more than 9 hours has similar, but less clear association with poor health outcomes.^{6,7} The clinician should ask about duration, quality and pattern of sleep. History from the patient can be augmented with information from the bed partner, as this can also provide important clues regarding sleep.¹⁹ Care should be taken to differentiate primary sleep disorders and sleep complaints secondary to another disorder. For instance, diagnostic criteria for several psychiatric illnesses including Attention Deficit Hyperactivity Disorder (ADHD), anxiety, depression, and bipolar disorder include sleep disturbance as part of the criteria but these would obviously be incorrectly categorized as a sleep disorder and should be treated with appropriate modalities. Sleep disturbance is also comorbid with several chronic health conditions such as Chronic Obstructive Pulmonary Disease (COPD), Alzheimer's dementia, asthma, fibromyalgia, and other chronic

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pain syndromes. Medications, including supplements, should be reviewed in any patient complaining of sleep disorder. Alcohol, food, and caffeine consumption, including chocolate, should also be reviewed. Some key historical features suggestive of a specific diagnosis include cataplexy with narcolepsy, limb movements after falling asleep in sleep movement disorders and limb movement preventing sleep initiation in restless leg syndrome. One of the more useful tools in the history in evaluating sleep disorders is a patient completed sleep diary. This diary should also include activities and behaviors just before bedtime as well, such as exercise and smartphone, tablet, laptop or television “screen time.” While sleep diaries are useful, patients typically over-report sleep duration when compared to objective measures.²⁰ Multiple night wrist actigraphy can provide objective measures of sleep duration and has been well validated to correlate with actual sleep duration.^{21,22} Diagnosis of sleep disorders can often be made by history alone, but in some cases diagnostic testing is indicated. Testing strategies include in home polysomnography or full formal polysomnography in a sleep lab. Most patients do not require advanced testing, but it should be considered if sleep apnea or a sleep movement disorder is suspected, or if the interventions for a sleep disorder fail. In home sleep studies have been shown to accurately diagnose obstructive sleep apnea but cannot differentiate between central and obstructive sleep apnea.²³⁻²⁵ The multiple sleep latency test is needed for the diagnosis of narcolepsy, and is useful for monitoring response to treatment. Physical exam is typically benign in most sleep disorders, but care should be taken to assess for craniofacial abnormalities, tonsillar hypertrophy and neck circumference. Clinicians can consider an easy screen for sleep disorders by adding the question “Have you had any difficulty with sleep in the past week” to the review of systems in a regular office visit.

TABLE 1:

Diagnostic criteria for insomnia

DSM 5 diagnostic criteria for insomnia	ICSD diagnostic criteria for insomnia
<p>A. Predominant complaint of dissatisfaction in sleep quantity of quality, with one or more of the following</p> <ol style="list-style-type: none"> 1. Difficulty initiating sleep 2. Difficulty maintain sleep 3. Early morning awakening <p>B. The sleep disturbance causes impairment in important areas of function (social, work , school, behavior)</p> <p>C. Occurs at least 3 night a week</p> <p>D. The difficulty is present for at least 3 months</p> <p>E. Occurs despite the adequate opportunity for sleep</p> <p>F. The insomnia is not better explained by another sleep disorder</p> <p>G. The insomnia is not due to the effects of a substance</p> <p>H. Co-morbid medical or psychiatric disorders do not adequately explain the insomnia</p>	<p>A. A complaint of difficulty initiating sleep, maintaining sleep, waking up too early of chronically non-restorative or poor quality sleep</p> <p>B. The sleep difficulty occurs despite the adequate opportunity an circumstances for sleep</p> <p>C. At least one of the following daytime impairment</p> <ol style="list-style-type: none"> 1. Fatigue of malaise 2. Attention, concentration or memory impairment 3. Poor social, vocational or school performance 4. Mood disturbance or irritability 5. Daytime sleepiness 6. Motivation, energy or initiative reduction 7. Proneness to errors at work or driving 8. Tension, headaches or GI symptoms in response to sleep loss 9. Concerns or worries about sleep

Adapted from DSM 5 and ICSD-2, ^{27,28}

INSOMNIA

Insomnia is the most common sleep disorder. Between 6-10% of the population meets diagnostic criteria for insomnia and up to one third of the population report at least some symptom of insomnia at any given time.²⁶ There are two main diagnostic rubrics for the diagnosis of insomnia that can be used, either from the Diagnostic and Statistical Manual edition 5 (DSM-5) published by the American Psychiatric Association or from the International Classification of Sleep Disorders version 2 (ICSD-2) published by the American Academy of Sleep Medicine (AASM).^{27,28} Both are accurate in the diagnosis of insomnia, with the ICSD-2 further subdividing insomnia into 12 further specific insomnia disorders. The diagnostic criteria for both are presented in Table 1. Clinicians should feel free to use either scheme as they both are able to support a primary diagnosis of insomnia remembering that the diagnosis rests mainly in the clinical interview. The duration of insomnia is important as the symptoms often wax and wane, and the most common form of insomnia is a secondary insomnia triggered by acute psychosocial distress. Sleep diaries, including peri-bedtime behaviors provide valuable information but should be used in conjunction with clinical interview as the patient with insomnia often over-estimates the time needed to fall asleep and underestimates the total time spent sleeping.²⁹ History should also include the timing of insomnia, difficulty with initiation of sleep, waking in the middle of the night or waking too early.³⁰ Interesting clues can be discovered if the patient is asked about their perception of the cause of insomnia, the subjective amount of sleep a patient feels is necessary as well as if the patient is taking daytime naps.

Numerous treatment modalities exist and while numerous pharmacologic agents exist, medications should be considered among the final options for management. Polling suggests that 4 out of 10 patients with chronic insomnia self-medicate with either over the counter sleep aids, usually anti-histamines, or alcohol.³¹ Several effective non-pharmacologic approaches are available all easily

discussed by the Family Physician in the office setting. The first step is to address sleep hygiene, the actual environment in which the patient sleeps and pre bedtime behaviors. Nicotine, large meals, caffeine, vigorous exercise, and alcohol should be avoided for several hours before bedtime. The bedroom should be cool, dark, well ventilated and the bed should be comfortable. Reading, watching television and computers, basic stimulus control, should be avoided while in the bedroom. While sleep hygiene is important, evidence suggest that sleep hygiene recommendations alone are not effective in the treatment of insomnia.³² Sleep restriction therapy has been shown to increase total time spent sleeping and decreasing sleep latency. In general sleep restriction therapy involves going to bed about 15 minutes before adequate time for sleep and gradually increasing this time to a full night.³³ Naps are avoided and a routine wake time is established as well. One study noted that simply reducing the total time spent in bed increased the amount of sleep, a very simple intervention.³⁴ Cognitive Behavioral Therapy (CBT) is another treatment known to be effective and should be considered first line therapy after sleep hygiene, but its use is limited in practice by the need for trained therapists to administer this modality. CBT involves a combination of sleep restriction, stimulus control, and cognitive measures to challenge the patient perceptions of insomnia. Cognitive therapy can involve writing worries about sleep in a journal, writing distressing thoughts to help clear the patients mind prior to bed and discussion of thought patterns that hinder sleep. CBT has been shown to be effective for long term treatment in as little as two sessions.³⁵ Self-help programs and online resources are also available at relatively low cost and given the efficacy of CBT should be dispensed as often as medications.

Several pharmacologic agents are available for insomnia each with relative advantages and disadvantages (Table 2). As the ideal pharmacologic agent with a short half-life, no risk of dependence, and no next day sedation that works for both sleep initiation and maintenance does not exist, clinicians should weigh benefits of the choice of pharmacologic therapy for each patient. In general, medications can be divided into three categories, benzodiazepines, non-benzodiazepines, and other agents. Benzodiazepine sleep agent use is limited by tolerance and dependence, and their use has been supplanted by the non-benzodiazepines, the so-called “z-drugs” such as zolpidem, eszopiclone, and zaleplon. Other agents include medications that are FDA approved for insomnia and work outside of the benzodiazepine receptor model. Some physicians may choose to prescribe trazodone or mirtazapine for sleep, but there is little evidence to suggest these work for sleep outside of insomnia associated with depression.³⁶ While sedating, anti-psychotic agents should be avoided as sleep aids given the significant potential for adverse effects.³⁷ There is significant debate on the long term nightly use of sleep aid medications. Agents should be used as sparingly as possible and for the shortest time needed. Zolpidem has been used nightly for up to one year without dose escalation or rebound insomnia, but about one third of patients gradually discontinued use of benzodiazepine sleep agents reverted back to nightly use by two years.^{38,39}

CIRCADIAN RHYTHM DISORDERS

Circadian rhythm sleep disorders are caused by a misalignment of the natural internal clock of the human body and the 24-hour external environment. The human body has a natural sleep-wake

cycle determined by a complex interaction of the central circadian pacemaker located in the suprachiasmatic nucleus, endogenous melatonin production, and core body temperature as well as external cues such as light/dark cycles. Studies have demonstrated that the internal circadian clock in the absence of external cues is about 24.2 hours.⁴⁰ Several circadian sleep disorders are recognized, including advanced or delayed sleep phase disorders, shift worker disorder and jet lag syndrome. Diagnosis for all is usually made by history and a sleep diary, but actigraphy can provide objective information on sleep wake cycles.

As the names imply, advanced or delayed sleep phase syndromes are the timing of sleep onset outside of socially accepted norms. Patients with advanced sleep phase difficulties will generally report an involuntary and significant urge to fall asleep from 6-9 PM, while delayed sleep phase syndrome patients will report an inability to fall asleep until 2-6 AM. Care should be taken to differentiate behavioral references for different bedtimes and sleep phase disorders. Patients with sleep phase disorders will have increasing difficulty adhering to societal conventions as time passes. Objective information with 7 nights of actigraphy or of a shift in core body temperature nadir, which is naturally lowest in the morning after a full night sleep, can aid in diagnosis. The therapy of choice for sleep phase disorders are chronotherapy, bright light therapy and melatonin. Chronotherapy is the delay of sleep by 3 hours every 2 days in delayed sleep phase, and the advancement of sleep by 3 hours every 2 days until the desired bedtime is reached. This technique requires significant time and strict adherence.⁴¹ Timed bright light for 2 hours, either in the morning from 7-9 for delayed sleep phase, or in the evening from 7-9 in advanced sleep phase. Melatonin, up to 3mg, given 5 hours before the desired bedtime in delayed sleep phase syndrome also appears effective, although most recommendations are based on expert opinion given a paucity of controlled trials.⁴¹

Shift work disorder is the result of having to sleep during non-standard hours. Estimates are that 20% of the workforce in industrialized countries work nonstandard hours and of those patients up to 10% have shift work disorder.⁴¹ Patients usually complain of non-refreshing sleep and excessive sleepiness that varied with work schedule. Treatment options include bright light exposure during the night, morning melatonin before sleep and adherence to sleep hygiene measures. Bright light and melatonin are used to help reset the circadian clock. Workers with rapidly varying schedules should likely not try to change circadian clock with bright light or melatonin. Stimulants such as caffeine, 200-400 mg at the start of a shift, or prescription modafinil 200 mg at the start of the shift. Modafinil is FDA approved for shift work disorder, but caution is advised as the stimulants improve sleepiness, but do not appear to improve alertness.⁴¹

Jet lag is the rapid desynchronization of an established circadian rhythm to a new rhythm, made possible by modern air travel. Symptoms are directly related to the number of time zones traversed and the main symptoms are insomnia and daytime sleepiness. Treatment usually lasts only for 3-4 days, with melatonin administered between 10-12 pm at the destination preceded by 3 nights of melatonin around 6 PM prior to leaving.⁴² Eastward travelers can be advised to avoid bright light in the morning and seek bright light in the evening and westward travelers can be advised to seek the opposite.

TABLE 2:

Medications for insomnia

Name	Cost/Generic Available	Half Life (Hours)	Controlled Substance / FDA Approved	Other Considerations
Nonbenzodiazepine				
Zaleplon (Sonata)	\$15 - \$30 / Yes	1	Yes / Yes	Ultra-short duration of action, rapid onset
Zolpidem (Ambien)	\$6 - \$12 / Yes	2 - 3	Yes / Yes	Controlled release formulas available, risk of abnormal sleep behaviors, max dose different for men and women
Eszopiclone (Lunesta)	\$20 - \$70 / Yes	6	Yes / Yes	1mg starting dose as 3mg can cause excess sedation for over 11 hours, unpleasant aftertaste
Benzodiazepine				
Triazolam (Halcion)	\$9 - \$30 / Yes	1.5 - 5.5	Yes / Yes	Rapid onset, risk of complex sleep related behaviors, aggression, caution when used with opiate analgesics
Temazepam (Restoril)	\$8 - \$12 / Yes	8.8	Yes / Yes	Intermediate onset, caution if used with opiate analgesics
Melatonin Receptor Agonist				
Ramelteon (Rozerem)	\$300 - \$350 / No	2 - 5	No / Yes	Can worsen depression, suicidal ideation
Orexin Receptor Agonist				
Suvorexant (Belsomra)	\$290 - \$300 / No	12	Yes / Yes	Long half-life can lead to next day sedation, give with caution to patients with respiratory problems, rarely associated with cataplexy
Antidepressants				
Doxepin (Silenor)	\$330 - \$340 / No	15	No / Yes	Generic 10mg Doxepin is generic and much less costly. Anticholinergic side effects, next day somnolence
Mirtazapine (Remeron)	\$4 - \$12 / Yes	20 - 40	No / No	Edema, increased hunger, weight gain, suicidality in patients under 24 with depression
Trazodone	\$4 - \$12 / Yes	3 - 6	No / No	Anticholinergic side effects, sexual dysfunction, next day somnolence suicidality in patients under 24 with depression
Antihistamines				
Doxylamine	\$4 - \$12 / Yes	10	No / Yes	Available over the counter, CNS depression, tolerance can develop quickly
Diphenhydramine	\$4 - \$12 / Yes	3 - 9	No / Yes	Available over the counter, CNS depression, tolerance can develop quickly

Prices from GoodRx.com, the best available price for 30 day supply, with coupon if freely available, reflecting prices in the authors' hometown and the nearest 2 metropolitan areas.

SLEEP RELATED BREATHING DISORDERS

Obstructive sleep apnea (OSA) has long been recognized, likely first characterized as Pickwickian syndrome in the 19th century, but with the advent of effective treatment obstructive sleep apnea has become an important target for detection and management. OSA is caused by lack of airflow through the upper airway, with several risk factors, including craniofacial abnormalities, narrow upper airway, tonsillar hypertrophy or laxity in the musculature of the upper airway leading to collapse during breathing. The classic symptoms of OSA include snoring, daytime hypersomnia and larger body habitus, but other symptoms such as morning headaches, nocturia and erectile dysfunction can also be symptomatic of OSA.⁴³ Nocturnal gasping or choking are the most reliable indicators of OSA.⁴⁴ Untreated OSA has important clinical consequences such as difficult to control hypertension, cardiac arrhythmias and congestive heart failure.⁴³

Several screening tools have been developed for use in primary care to help identify patients at risk for obstructive sleep apnea, with the STOP-Bang and Berlin questionnaire as the most sensitive tool for finding patients with moderate to severe OSA.⁴⁵ There is not a recommendation for the primary care physician to screen for sleep apnea in the general population from primary care professional societies. Diagnosis of sleep apnea requires a sleep study, either in home or in a sleep lab. Traditionally, full in lab polysomnography was thought to be required for diagnosis but in home testing has been shown to be as effective in identifying patients with OSA, regardless of pretest probability.^{46,47} Sleep testing looks for episodes of stopping breathing or shallow breathing, with or without hypoxia. These episodes are translated into the apnea-hypopnea index, the AHI, essentially the number of times per hour a patient has a significant respiratory disturbance. OSA does not have a universally accepted definition, but the AASM defines mild OSA as an AHI of 5-15, moderate as 15-30 and severe as 30 or more, and daytime sleepiness must be present.⁴⁸

Treatment of OSA usually involves continuous positive airway pressure (CPAP) devices. CPAP provides constant upper airway support, alleviating the collapse of the upper airway. Several other airway support devices such as bi-level positive airway pressure (BiPAP), adaptive servoventilation (SV) and volume assured pressure support (VAPS) are also available, but are limited to very specific clinical situations. Adherence to CPAP is notoriously poor but educational and behavioral interventions have been shown to increase adherence.⁴⁹ Oral appliances can be used for sleep apnea, but are more appropriate for mild OSA or for patients intolerant of CPAP. One study demonstrated that oral appliances were as effective as CPAP, but the study conclusions are limited by short duration, one month, and low adherence rate to CPAP.⁵⁰ Oral appliances do not appear to improve daytime sleepiness symptoms but do decrease snoring, the clinical significance of which is not clear.⁵¹ Surgical resection of the upper airway to improve patency has limited outcomes at this time and should only be considered as a last resort for treatment of OSA.

SLEEP BEHAVIOR DISORDER

Commonly known as parasomnias, sleep behavior disorders involve complex movement and behaviors during sleep. Patients may seem to move or behave with purpose in a goal directed fashion,

but by definition of the disorder, the patient is asleep. Diagnosis is usually clinical, based on history alone but overnight video polysomnography can be obtained if the diagnosis is not clear. Collateral informants are key to the history and a validated questionnaire, The Mayo Sleep Behavior Questionnaire, is also available to aid in diagnosis.⁵² Sleep behavior disorder can be very distressing for both the patient and bed partner and have some of the most unusual symptoms of all of the sleep disorders. In describing sleep behavior disorders, it is useful to categorize the disorder as occurring during REM sleep or not during REM sleep. REM sleep is the phase of sleep when dreams occur and is accompanied by muscle paralysis.

Common non-REM sleep disorders include, sleep walking, sleep talking, and sleep terrors. While these are very different events, they do share some common clinical features. Patients do not remember the events, have minimal cognitive function and often appear awake, patients may even have their eyes open during the events.⁵³ Sleep terrors should not be confused with a nightmare, as the patient is not having a dream, as they are not in REM sleep. Patients in a sleep terror can sound extremely distressed, but bed partners should be assured that the episode is not harmful. A specific sub-type of sleepwalking includes sleep related eating disorder, when patients will have amnesic episodes of eating during sleep.⁵⁴ The underlying etiology of these events are not clear but they do seem to be related to acute psychosocial stress. Treatment is rarely needed, usually education about the transient and benign nature of the events. Medications that are associated with the events include serotonin modifying antidepressants and short acting hypnotics and should be stopped if clinically warranted. Paradoxically, sleep related eating disorder first line treatment includes selective serotonin reuptake inhibitors (SSRIs), while topiramate is a reasonable second option.⁵⁵ If the events do become more common, a safe sleep environment should be ensured.

REM associated sleep behavior disorders include nightmare disorder and REM sleep behavior disorder. Nightmare disorder sounds as if it should be similar to sleep terror, but there are several important distinguishing features. Nightmare disorder usually involves intense and vivid dreams that the patient will remember. Patients will move very little during a nightmare and will behave relatively normally upon waking, whereas sleep terrors can involve intense movements and patients are typically very confused upon waking. Treatment is usually supportive if needed. If a patient is particularly active, violent or are enacting very complex activities, REM sleep behavior disorder (RBD) should be considered as an alternate diagnosis. RBD usually corresponds to the dream state of patients, typically a dream that involves the patient being attacked, or the patient being placed in an unpleasant situation, although this presumption is still under debate.^{56,57} RBD occurs because of pathological loss of the normal muscle paralysis with REM sleep. Assault of bed partners or expletive laden vocalizations can occur. RBD tends to respond very well to either melatonin or clonazepam.⁵⁸ Patients and bed partners should seek to maximize safety, such as removing sharp objects, firearms etc. RBD is associated with neurodegenerative diseases such as Parkinson's disease and Lewy body dementia.⁵⁹ RBD may precede the onset of these conditions by decades but if the disorder presents in younger patients, medication side effects are more often the etiology.

DAYTIME SLEEPINESS DISORDERS

Narcolepsy and idiopathic hypersomnia are the most common disorders falling under this term. Both involve excessive daytime sleepiness with the cardinal distinguishing feature of narcolepsy being cataplexy, sudden loss of muscle tone triggered by emotions.^{60,61} Loss of muscle tone can be very subtle, such as a head bob or loss of jaw tone, or can be very profound such as general loss of tone resulting in collapse, the “sleep attack.” Both require daytime sleepiness, but patients with idiopathic hypersomnia typically do not find daytime naps to be refreshing. The Epworth Sleepiness Scale, presented in Table 3, can help identify patients with significant daytime sleepiness and correlates well with sleep latency, the time needed to fall asleep, as measured on a multiple sleep latency test. The diagnosis of narcolepsy typically includes an overnight sleep study followed by a multiple sleep latency test, to prove the markedly reduced time needed to fall asleep. Narcolepsy diagnosis can also be made clinically based on daytime sleepiness with cataplexy. A decrease in CSF hypocretin level in the presence of daytime sleepiness and cataplexy is diagnostic of narcolepsy and can be considered in lieu of a multiple sleep latency test.⁶²

Treatment of narcolepsy and idiopathic hyper somnolence is very similar, typically consisting of stimulants. Modafinil, 200-400 mg daily, reduces daytime somnolence and has the FDA indication for narcolepsy.⁶³ Other stimulants such as methylphenidate and amphetamines are tempting to use but sympathomimetic side effects tend to limit use, and should be considered second line treatment. Armodafinil is a long acting isomer of modafinil and has similar effects, but does not carry the FDA indication for narcolepsy and evidence is lacking regarding superiority. Cataplexy associated with narcolepsy traditionally was treated with either fluoxetine or clomipramine, but there is no evidence of efficacy of this treatment.⁶⁴ Cataplexy can be treated with sodium oxybate with a goal dose of 6-9 grams per night.⁶⁵ Titration to goal dose can take several weeks and optimal response usually takes 8-12 weeks.

TABLE 3:
Epworth Sleepiness Scale

How likely are you to fall asleep or doze off in the following situations?			
0 = No chance of dozing	1 = Slight chance of dozing	2 = Moderate chance	3 = High chance of dozing
<ul style="list-style-type: none"> Sitting and reading Watching TV Sitting inactive in a public place (theater, meeting) As a passenger in a car for an hour without a break 		<ul style="list-style-type: none"> Lying down to rest in the afternoon when circumstances permit Sitting and talking to someone Sitting quietly after lunch without alcohol In a car, while stopped for a few minutes in traffic 	
TOTAL SCORE INTERPRETATION			
0 - 7: Unlikely abnormally sleepy			
8 - 9: Average amount of daytime sleepiness			
10 - 15: May be excessively sleepy depending on the situation, consider medical advice			
16 - 24: Excessively sleepy, consider medical attention			

Adapted from Johns MW. A new method for measuring daytime sleepiness: The Epworth Sleepiness Scale. *Sleep* 1991; 14(6):540-5.

SLEEP MOVEMENT DISORDER

Common sleep movement disorders include restless leg syndrome (RLS), Periodic Limb Movement Disorder (PLMD) and sleep bruxism. While RLS and PLMD sound very similar it should be noted that they are in fact distinct diagnoses. Likely more common than previously appreciated, these disorders are an important cause of poor sleep for patients and bed partners.

RLS, recently also referred to as Willis Ekbom disease, has certainly grown in public awareness as a neurological disorder. Though unpleasant and uncomfortable, it is often not “painful.” Typically, symptoms are distal to the knee and deep, not in the skin, but can also involve arms. Common descriptive terms patients may offer in the history include feelings of crawling, creeping, pulling, itching, burning, twitching, aching and restlessness.^{66,67} The diagnosis of RLS/WED can usually be made on clinical grounds, while the polysomnograph may be useful with the periodic limb movement assessment. Diagnostic criteria are the urge to move the legs, usually accompanied by the unpleasant sensations and the urge or sensations begin or worsen during periods of inactivity, such as lying, sitting, or going to bed. The patient experiences partial or total relief by movement or activity, such as walking or stretching for the duration of the activity and the symptoms are worse in the evening or night than during the day or that they occur only at night. RLS/WED is idiopathic or primary in most patients; but comorbid associations, especially with iron deficiencies, RLS/WED may be the initial presentation of an iron deficiency. Checking a serum ferritin level is often useful, with a target ferritin level of greater than 50 ng/mL.⁶⁸ The exact pathophysiology of RLS is not understood, but given the responses to iron supplementation and dopaminergic medications the role of central nervous system stores of iron and dopamine seems central. Targeting dopaminergic pathways, commonly used agents to date have included short acting dopamine antagonists dosed typically much lower than the indication of Parkinson Disease. Targeting dopaminergic pathways, commonly used agents to date have included short acting dopamine agonists dosed typically much lower than the indication of Parkinson Disease (PD).⁶⁹ The downside of the dopaminergic agents include normal

dopamine agonist side effects and the phenomenon of augmentation, in which symptoms tend to migrate to become more severe during the day.⁷⁰ These include cardilopa-levodopa, pramipexole and ropinerole with similar typical titration approaches up to a maximum for the RLS/WED indication. GABA analogs gabapentin and pregabalin have been used with success and in some studies a lower augmentation rate than the Parkinsonian agents.^{71,72} Exercise has been shown to decrease symptoms and abstinence from caffeine, nicotine, alcohol and antihistamines should be considered.⁷³

PLMD is repetitive, highly stereotypical movements during sleep that is associated with many sleep and neurological disorders including RLS, OSA, REM sleep behavior disorder, narcolepsy, and PD.⁷⁴ The relationship with symptoms such as insomnia and daytime somnolence is inconsistent and therefore controversial. PLMD is diagnosed based on history and observation of limb movements during a sleep study. One should take the view PLMD may accompany another disorder but assignment of a diagnosis of PLMD should be reserved for when unaccompanied by another disorder and the limb movements themselves are suspected to be the causation of excessive sleepiness or insomnia. PLMD is thought to be a distinct and mutually exclusive diagnosis from RLS/WED. Many patients with RLS have PLMD but the converse is not necessarily true. Management of such has rather limited data and most approaches are indeed derived from managing the related disorders, for example, the GABA analogues and dopaminergic agonist agents all seem to affect a reduction in the periodic limb movement index, similar to RLS.⁷⁵ For PLMD without RLS symptoms treatment should focus on the primary disorder with independent treatment of PLMD rarely needed.

Sleep bruxism is teeth grinding and rhythmic masticatory muscle activity (RMMA) occurring during sleep, keeping in mind that up to 60% of normal adults demonstrate RMMA without teeth grinding. Risk factors include obstructive sleep apnea syndrome and other sleep breathing disorders, loud snoring, moderate daytime sleepiness, heavy alcohol use, caffeine consumption, smokers, anxiety and being subjected to a highly stressful life.⁷⁶ Complications and consequences include destruction of tooth structure, periodontal and other dental problems, damage to the TMJ, myofascial pain, muscle contracture and other muscular problems.⁷⁷ There are significant implications for iatrogenic emergence of RLS and bruxism with the use of SSRIs and venlafaxine intended to treat any combination of anxiety, depression and insomnia. Dental splinting device is a common non-pharmacological approach to arrest progression of dental and periodontal complications and should be considered the first line therapy. Referral to dentistry should be sought early in the disease for fitting of an oral appliance. Mandibular advancement devices decrease bruxing but device discomfort is the greatest barrier to consistent use and occlusal devices protect the teeth from further damage but do not decrease bruxing.^{78,79} Pharmacologic interventions are second line therapy, effective agents including clonidine and clonazepam, with therapy considered only when pain affects quality of life or in patients at risk for significant tooth damage.^{78,80} Other medications such as levodopa, propranolol, amitriptyline and bromocriptine have been shown to be ineffective and should be avoided.⁷⁸

CONCLUSION

Sleep disorders are a common complaint that will be encountered by the family physician. Management can easily be initiated based on history and physical exam. Full polysomnography is not needed for all sleep complaints. Patient centered therapy and education are critical for long term successful treatment.

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Keeping Slipped Capital Femoral Epiphysis in Mind

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A 13-year-old previously healthy male presents for evaluation of acute right knee pain that has been present for the past several weeks. The pain is described as cramping in nature, radiating proximally to the right thigh. Pain is intermittent. Knee pain was reported to have a sudden onset when the patient missed a step going down the stairs, hitting his knee in a flexed position on a hard floor when he fell. Patient reportedly felt a “pop” and immediate pain. Pain is provoked with ambulation. Patient denies any knee swelling, fever, chills, numbness, weakness, or difficulty bearing weight. The patient has not taken any pain-relieving medicine and denies any alleviating factors.

Upon physical examination, the patient is noted to have an antalgic gait. There was a noted 5 cm difference in leg length, with the right leg being shorter. There is limited right hip range of motion (ROM), particularly in internal and external rotation. McMurray’s test and Lachman’s test were negative. There was no crepitus upon right knee ROM testing. Body mass index (BMI) was 23.46 kg/m.² Radiographic images of the pelvis and right knee were obtained for further evaluation..

QUESTIONS:

What is the most likely diagnosis?

- A. Anterior hip dislocation
- B. Legg-Calvé-Perthes disease
- C. Metaphyseal-epiphyseal type III fracture
- D. Osteomyelitis
- E. Slipped capital femoral epiphysis

For a case presenting as above, what would be the best initial imaging exam?

- A. MRI right knee
- B. XR Bilateral hip
- C. XR right knee
- D. B & C
- E. All of the above

What is the single greatest risk factor for the likely diagnosis?

- A. Endocrinopathies
- B. History of previous radiation therapy to the affected region
- C. Male gender
- D. Mechanism of trauma
- E. Obesity

FIGURE 1:



FIGURE 2:



FIGURE 3:



CORRESPONDENCE:

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ANSWERS

What is the most likely diagnosis?

The correct answer is:

E) Slipped capital femoral epiphysis

Provided the history, physical examination, and radiographic images presented, it can be confidently stated that the patient has acquired right-sided slipped capital femoral epiphysis, likely secondary to trauma.¹ The patient is within the average age range (10 to 15-years-old) most likely to develop SCFE.² Children within this age range presenting with knee pain radiating to the hip, leg length discrepancy, and an antalgic gait should be considered to have SCFE until proven otherwise. The radiographs provided help to confirm our suspected diagnosis and show the metaphorical “ice cream slipping off the cone,” which represents the misalignment of the epiphyseal head with the metaphysis along the growth plate.¹ Pelvic hip radiograph represents the unilaterality of the disease. It is important to note that SCFE falls under the category of a Salter Harris type I fracture, which is a fracture along the physis, leaving the epiphysis and metaphysis directly unaffected. In comparison, Salter Harris type III fractures present with a fracture through the epiphysis and physis of the joint.³ SCFE does not satisfy the criteria to be labeled as a Salter Harris type II-V fracture. Legg-Calvé-Perthes disease is idiopathic avascular necrosis of the femoral head, which typically presents with widening of the joint space due to inflammation of the joint capsule and a crescent sign (subchondral epiphyseal lucency representing necrotic bone).⁴ Neither of these are clearly visible on the radiographs. Osteomyelitis presents with a more infectious clinical picture. The radiograph for osteomyelitis would show soft tissue effusions, blurring of soft tissue planes, and bone destruction in the form of cortical lucency and lytic lesions.⁵

Anterior hip dislocations tend to show up clearly on radiographic imaging, with the femoral head located in an inferior position in comparison to the acetabulum.⁶ The patient presenting with anterior hip dislocation would not be able to ambulate, and would most likely not be able to bear weight.

For a case presenting as above, what would be the best initial imaging exam?

The correct answer is:

D) B & C - XR Bilateral hip and XR right knee

Unilateral Late Initial imaging for a pediatric patient with a limp must begin with X-ray evaluation of the affected knee and bilateral hips. In cases of hip pathology such as Slipped Capital Femoral Epiphysis, knee pain may signify referred pain from true hip pathology. This makes it very important to evaluate both the knee and hip joints in patients with similar presentations. X-ray imaging is the best initial imaging exam, as it is readily available and inexpensive in comparison to MRI and CT scanning.⁷ Identification of SCFE on X-ray is diagnostic, and emergent action must take place without delay upon diagnosis. Both anteroposterior and lateral views of the hips obtained via frog-leg or cross-table views should be used for adequate evaluation of joint spaces and bony features.⁷ Bilateral hip X-ray should be obtained to allow direct comparison and to help identify modest discrepancies in anatomy. Additionally,

MRI can provide extra diagnostic information as it is able to detect pathology earlier and can demonstrate early marrow edema.^{8,9} Despite its usefulness, MRI is not the best initial test for examination.

What is the single greatest risk factor for the likely diagnosis?

The correct answer is:

E) Obesity

All of the multiple choice answer options are known risk factors for developing SCFE.^{2,10-14} Of all known risk factors, obesity is the single greatest risk factor for developing SCFE.¹⁰⁻¹² In the pediatric population, there is a significant positive correlation between BMI above the 95th percentile for age and a diagnosis of SCFE.¹⁰ Part of the reason may be that children have developing growth plates that have yet to fuse. Additionally, the hip is an important weight-bearing joint that can be compromised by excess weight or force during a child’s skeletal developmental period. Another risk factor for developing SCFE is the presence of an endocrinopathy, such as hypothyroidism. This complication has been reported in cases of young adults as well.^{14,15}

As observed, total body radiation exposure among patients with pediatric cancer may also contribute to an increased incidence of SCFE, most likely due to a decreased growth hormone production.¹³ Male gender and trauma are also established risk factors in the development of SCFE.^{2,11} It is important to note that physical activity is not a risk factor for developing SCFE.¹¹

DISCUSSION

Introduction/Epidemiology/Risk factors

Slipped capital femoral epiphysis is a unique disorder in adolescent patients that is not uncommon and has long-term effects on those afflicted despite surgical intervention, requiring the attention of primary care physicians who are the in the frontlines of evaluation and treatment.¹⁶ The overall international incidence ranges from 0.33/100,000 to 24.8/100,000 children between the ages of 8-15 years. In the United States alone, the overall incidence is 10.8/100,000, although incidence varies by region.² An updated report on SCFE epidemiology has even suggested that climate variations may play a role in occurrence, noting that northern cities have positive correlations of SCFE during autumn seasons.^{2,17} It has been established that male gender has a higher incidence in comparison to females, with an incidence of 13.³⁵ out of 100,000 among males, compared to 8.07 out of 100,000 among females.¹⁷ For boys, the average age of occurrence is 12 years, versus 11.2 years for girls.² It is important to note that the average age of occurrence has been decreasing, thus SCFE has been diagnosed in younger and younger patients over the years.² Despite this trend in decreasing age at diagnosis, there have been cases of older patients who have developed SCFE, usually associated with an endocrinopathy such as hypothyroidism.^{14,15} Another important epidemiological factor to consider is racial differences in occurrence. Recent studies in the U.S. have noted that African-American patients have a higher incidence of SCFE in comparison to Hispanic, Asian/Pacific Islander, and Caucasian patients. Obesity has been proven to have a strong correlation with SCFE.^{2,10,12,17} A retrospective study on SCFE patients and associated BMIs showed that 81.1% of the

patients had a BMI above the 95th percentile.¹⁰ A correlation has been observed stating that the higher the BMI, the higher the incidence of bilateral SCFE.^{10,12} All of the above are important factors to consider when evaluating pediatric patients with suspicions of slipped capital femoral epiphysis.

Pathophysiology

It is not completely understood why SCFE occurs.¹ There have been considerations to its etiology but has generally been deemed idiopathic in nature. The pathology in SCFE is essentially a Salter Harris Type I fracture involving the misalignment of the femoral epiphyseal head along the physis in comparison to the metaphysis or femoral body. It is probable that dysfunction occurs due to the weakness of growth plates during developmental stages of adolescence, particularly during accelerated growth phases. Provided the strong association of SCFE with obesity and the possibility of traumatic causes, there is a possibility that mechanical forces are to blame for epiphyseal slipping off the femoral neck. In 2015, a computational model was developed to help ascertain the mechanical forces that lead to SCFE. The study concluded that body mass, type of physical activity, and the presence of a perichondrial ring were the most important factors to developing epiphyseal slippage, whereas physeal-diaphysis angle and the physeal thickness did not play as heavily as a role in pathology.¹⁸ In addition to mechanical forces, metabolic factors have been suggested to play a significant role in the development of SCFE. Endocrinological conditions such as hypothyroidism, hypogonadism, and growth hormone deficiencies have been associated with SCFE.¹⁹ A recent study has suggested that effects on the growth hormone-insulin-like growth factor 1 axis by these various metabolic conditions may be responsible as the hormone is important for growth plate composition and eventual closure.²⁰

Presentation/Classification/Severity

As discussed above, patients with SCFE can present with knee pain that sometimes radiates towards the ipsilateral hip, leg length discrepancy on exam, an antalgic gait, and difficulty bearing weight or ambulation.¹ Patients may also have diminished hip ROM, particularly in internal and external rotation.¹ Current classifications of SCFE are based on stability and severity of slippage. Stability of the hip in SCFE is determined by whether or not the patient can bear weight or not.²¹ If a patient is able to bear weight, with or without crutches, then it is considered a stable SCFE. Inability to bear weight is considered unstable.²¹ Severity of SCFE is determined by the angle the femoral body with the femoral head. An angle of <30 is considered mild, 30-50 is moderate, and >50 severe.²²

Diagnosis

SCFE is primarily diagnosed through the use of radiographs.⁷ For patients presenting with knee pain, and within the demographics discussed above, the provider should obtain X-ray imaging of the knee in AP and frog-leg view, along with bilateral hip X-rays for comparison and to rule out bilateral SCFE. CT and MRI imaging is not routinely used for diagnosis, but may be added to further evaluate severity of disease and in assessing the prognosis. Additionally, in questionable cases, CT scanning or MRI may detect small slippages. In postoperative management, CT and MRI have been used by surgeons to help further assess and identify the degree of pathology preoperatively and complications postoperatively, such as hardware failure, ischemic necrosis, and morphology predispos-

ing to femoroacetabular impingement.²³ Furthermore, physicians should consider screening for endocrinopathies in patients in atypical presentation such as patients outside of the typical age range.

Treatment/Management

Untreated SCFE leads to conditions such as avascular necrosis, which may be unseen on imaging until 6-24 months after occurrence, and severe degenerative arthritis in the affected hip.^{1,24} Long term outcomes are favorable when the degree of slippage is minimal.¹⁶ As prognosis depends on severity, the goal of treatment is to prevent further slippage of the femoral head until the growth plate has closed.¹ Despite a growing change in surgical management and practice among orthopedic surgeons, the general treatment of SCFE still remains in the form of immediate surgery as conservative therapies tried in the past did not only show significant benefit.²⁵ To reiterate, once a diagnosis is made, treatment should not be delayed and the patient should be referred to orthopedic surgery immediately. Follow-up after surgical treatment requires re-evaluation every 3-4 months for up to 2 years. During this time, the patient will likely be restricted in physical activity to prevent complications from occurring and to allow healing. Afterwards, these patients may return to normal physical activity, including exercise, pending the surgeon's recommendations.¹ Though the definitive management has been established with surgical intervention, there have not been formal studies or investigations to whether or not osteopathic manipulative therapy/OMT can improve outcomes in the post-operative period. Moving forward, I believe OMT has the potential in improving long term outcomes, functional recovery, shorter times for return to physical activity, and decrease in long term complications.

Conclusion/Importance of discussion

As primary care physicians, we are to keep our differential diagnosis broad when brainstorming on probable causes to dysfunction. As unusual of a condition slipped capital femoral epiphysis is, it is relatively common in the U.S. and should be kept in the back of our minds when assessing lower extremity dysfunction and pathology in the pediatric population. Without diagnostic imaging, presentation of symptoms in SCFE can be vague, thus carrying the risk of a missed diagnosis for physicians in a condition with long-lasting effects on a typically young patient.²⁶ Awareness is important as primary care physicians and holding low threshold to evaluate and rule-out pathology is essential. In addition, provided the musculoskeletal nature of the disease and its treatment, there is great opportunity and potential for research to define the role of osteopathic manipulative therapy in its possible inclusion of SCFE post-operative management.

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MARCH / APRIL 2017 ANSWERS: 1. A 2. A 3. C 4. D 5. A 6. D 7. A 8. D 9. B 10. B



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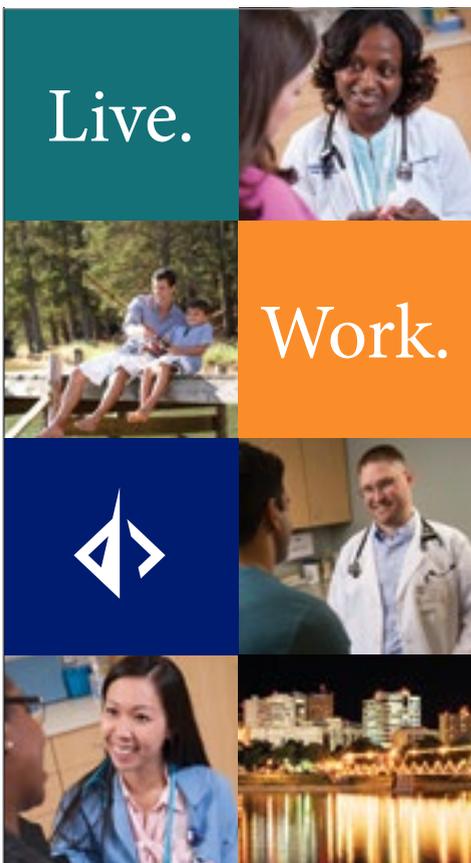
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CIRCUMCISION

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Circumcision is the surgical removal of the foreskin, the skin that covers the tip of the penis. It is usually done before the baby goes home from the hospital. A baby must be stable and healthy to be circumcised. Though commonly performed in the United States, circumcision is not a required medical procedure. The American Academy of Pediatrics considers circumcision a choice for parents to make based on the possible benefits and risks of the surgery, as well as their own religious, cultural, and personal preferences. Not all insurance companies pay for the procedure. If you plan to circumcise your son, you should contact your insurance provider for information about coverage.

BENEFITS:

- A slightly lower risk of urinary tract infections (UTIs). In the first year of life, a circumcised boy has about one in 1,000 chance of getting a UTI. A baby who is not circumcised has a one in 100 chance of getting a UTI in the first year of life.
- A lower risk of cancer of the penis. Penile cancer is very rare in both men who are or are not circumcised. In addition, cervical cancer is less common in the female sexual partners of circumcised men.
- A possible lower risk of sexually transmitted infections. Practicing safe sex, along with using a condom, is the best protection against sexually transmitted infections, including human immunodeficiency virus (HIV).
- Prevention of foreskin infections and phimosis, a condition in which it is very difficult to pull back the foreskin. In uncircumcised boys, use of proper hygiene can help lower the chance of getting infections, cancer of the penis, and sexually transmitted infections.

RISKS:

- Your baby may feel some pain during the procedure. You can ask that a numbing medicine be put on your baby's penis to lessen the pain.
- A low risk of bleeding, infection, and injury to the penis or urethra.
- When the foreskin is removed, the tip of the penis may become less sensitive to touch and irritated. This could cause the opening of the penis to become smaller making it difficult to urinate which may need to be corrected surgically.
- These risks are higher when circumcision is performed on older babies, boys, and men.

MEDICAL CARE & TREATMENT OPTIONS:

If you have any questions about circumcision, please contact your Osteopathic Family Physician. Your physician can answer your questions and provide you with any additional information so that you can make the best informed decision based on the benefits and risks, as well as your religious, cultural, and personal preferences. In case of any emergency, you should call your doctor or 911 right away.

SOURCE(S): American Academy of Pediatrics, Circumcision. Gov, Mayo Clinic, National Institutes of Health, and Up-To-Date

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