Department of Family Medicine and Community Health
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

Madison and Baraboo Family Medicine
Residency Programs

Scholarly Projects and Community Health Learning Experiences

From the Class of 2018

Matthew Brown, MD

Projects Completed During Residency:

Scholarly Project:

Establishing an Optimal Aerobic Fitness Measure to Best Predict In-Season Injury Risk in Collegiate Athletes

Community Health Learning Experience:

Dryden Terrace Hot-Spotting:

During residency I participated in this community partnership between numerous agencies including the DMFCH, the Madison Fire Department, Dane County Public Health and residents/staff at the Dryden Terrace Apartments, a subsidized housing complex next to the Northeast Clinic which was identified by the Fire Department to have a disproportionate number of 911 calls per capita within the City of Madison. We meet monthly with residents of the complex during "Dining With the Doctors" lunches to build trust as well as improve health knowledge, resident engagement and empowerment to improve health and decrease resource utilization. Specifically I worked to improve knowledge related to falls risks and partnered with the University of Wisconsin Department of Physical Therapy to conduct falls risks assessments and implement falls prevention strategies.

Thank you to my wife Marie for her innumerable sacrifices for me and our family over the past three years and to our daughter Ovidia who makes me smile every day and keeps me focused on what really matters. I love you both so much.

A lifelong Wisconsin resident, Matt Brown earned his bachelor's degree in Kinesiology-Exercise Science from the University of Wisconsin in Madison. He practiced as a physical therapist in an innovative "Physical Therapy Urgent Care" before returning to UW to complete his medical degree at the School of Medicine and Public Health. His experience as a physical therapist has fostered a particular interest in sports medicine and movement-related medicine; however he is also drawn to family medicine for its broad range of patients and medical problems, as well as its focus on caring for the whole patient within a context of social, cultural, and economic factors that impact health. During medical school, Matt volunteered at the student-run MEDiC clinics and served as the Clinic Coordinator during his second year. He also volunteered as an instructional assistant for several study groups for junior medical students. Outside of medicine, Matt is passionate about sports, especially football (he played Division I football for the Badgers as an undergraduate). He also enjoys cross-country skiing, cooking, traveling, and spending time with family and friends.

transfusion. With continued bleeding, treatment includes either angiography with embolization or surgical ligation and evacuation of hematoma.

Outcome: She was discharged from ED with PMD follow-up the next day CBC stabilized on second day. Repeat CT scan 3 days later revealed smaller RSH. Aspirin was restarted 1 week later.

Return to Activity and Follow-up: She returned to work by day 10. One month follow-up abdominal ultrasound showed persistent but smaller RSH. She returned to exercise class 12 weeks later, and reduced her workout repetitions.

Debilitating Large Muscle Soreness in a High School Football Player

Matthew M. Brown, DPT, MD, Andrew M. Watson, MD, and Kathleen E. Carr, MD

Affiliation: University of Wisconsin-Madison Department of Family Medicine and Community Health, Madison, Wisconsin.

History: Over the 5-hour first practice of the season, this healthy 16-year old developed debilitating large muscle soreness. Following practice he noted "cola-colored" urine and presented to his primary care doctor. There he had elevated LFTs and bilirubin, a UA with 2+ protein and 3+ blood and a CK of 35K which prompted transfer to our hospital. On the wards he reported continued muscle soreness and dark urine. He had similar but milder muscle soreness without urine changes several times over the past 6 years, particularly following prolonged periods of exercise. The episodes were increasing in severity. He denied muscle stiffness or increased temperature with any episodes. He denied family history of similar symptoms or anesthesia complications. He was conceived by sperm donation and knew little of his father's medical history. Home medications were topical clindamycin and tretinoin for acne. He denied use of supplements, alcohol, tobacco or other drugs.

Physical Examination: Vital signs: Afebrile, BP 132/78, Pulse 76, RR 16, O_2 Sat 98%, 198 lb. Well appearing in no acute distress. HEENT, heart, lung and abdomen exams were normal. Legs warm and well perfused without edema or cyanosis. Skin with scattered acne. Muscles with normal tone and bulk with generalized muscle tenderness particularly of thighs and back. Strength in large muscle groups of the upper arms, hips and thighs were 5/5 although painful. Remaining neurologic exam was normal.

Differential Diagnosis:

- Exertional Rhabdomyolysis
- Metabolic Myopathy (Glycogen Storage Disease, Disorders of Fatty Acid Metabolism, Mitochondrial Disease)
- Channel Related Gene Mutations (Malignant Hyperthermia)
- Infectious Myositis
- Drug Induced Rhabdomyolysis

Tests and Results: ALT 457, AST 2941, Bili 1.8, Cr 0.9, BUN 14, CK 31K. TTE: Normal Plasma Amino Acids: Normal Urine Organic Acids: Normal Plasma VLCFA: Normal Plasma Acylcarnitines: Abnormally elevated.

Final/Working Diagnosis: Carnitine Palmitoyltransferase II (CPT II) Deficiency.

Discussion: Recurrent episodes of rhabdomyolysis suggest genetic causes such as mitochondrial disorders, disorders of glycogen storage, fatty acid metabolism and channel related gene mutations such as malignant hyperthermia. A genetics consult is helpful in work-up which begins with assessing plasma amino acids, urine organic acids, plasma VLCFA and acylcarnitines. CPT II Deficiency is an autosomal recessive disorder that affects the transport of long-chain fatty acids into mitochondria for beta-oxidation. CPTII deficiency can present in multiple forms. In its more common form it presents in adolescents or young adults as recurrent myoglobinuria following prolonged exercise, illness, cold exposure or lack of sleep. Treatment focuses on dietary supplementation with medium-chain triglyceride oil, which is transported to the mitochondria independent of the deficient transporter and strict dietary efforts to avoid prolonged fasting with adequate hydration and glucose during periods of exercise or illness.

Outcome: Rhabdomyolysis was treated with IV fluids and genetics was consulted. CK peaked at 12 hours after initial draw at 51K. Cr remained stable. A day later CK was 10K and he discharged with instructions to avoid prolonged vigorous activity or fasting. In genetics clinic he underwent genetic testing for CPT II deficiency which was positive. He was seen by a dietitian to initiate supplementation with medium chain triglyceride oil and started a regimen to avoid prolonged fasts particularly with exercise.

Return to Activity and Follow-up: CK normalized in 1 week and he was allowed to return to sport. He did well with his nutrition plan and MCT oil supplementation. In the fifth week of the season, symptoms recurred after a particularly strenuous game. CK elevated again to 22K and he was readmitted for management of rhabdomyolysis.

Looking Beyond the Joints, an Uncommon Case of Hip Pain

Ronan Cahill, MD, Adam Pourcho, DO

Affiliation: Swedish Medical Center—Sports, Spine and Musculoskeletal Medicine, Seattle, Washington.

History: 47-year-old female presented to this clinic with a greater than 2 years history of right anterior thigh pain. She had previously been an ultramarathon runner and cyclist but had to stop these recreational activities secondary to pain. Her pain started the day after running a marathon in September 2014. She completed that marathon with symptoms of mild calf tightness and anterolateral thigh "giving out" during the last mile. The following day she developed right posterolateral buttock pain with radiation to anterior and mid-thigh with ambulation. She had an extensive workup prior to presentation at the sports medicine clinic and was being treated under the working diagnosis of radiculopathy. She had MRIs of her right knee, right hip and lumbar spine. She had tried physical therapy, chiropractic care, lumbar epidural injection and watchful waiting. None of these relieved her symptoms. At initial presentation to the sports medicine clinic, she complained of right anterior thigh cramping that starts with 15 minutes of running and stops within an hour after rest. The pain is severe and rated 7/10 with activity. The pain does not radiate and is located in the anterior thigh. She denies lower back pain, numbness, tingling or other neurological signs. She has no pain with squatting down and minimal periodical pain with prolonged walking.

Physical Examination: On exam, the patient had a normal gait, a small right knee effusion and tenderness to palpation over the distal myotendinous junction of rectus femoris and vastus lateralis. Hip ROM was full and non-painful, with negative FADIR and Stinchfield tests. Knee exam was negative for ligamentous laxity or point tenderness. She had bilateral weakness of hip abductors.

Differential Diagnosis:

- Hip Labral Tear
- Femoral Acetabular Impingment
- Iliac Artery Endofibrosis
- Inflammatory Myopathy
- Meniscal Tear of Knee

Tests and Results: A complete diagnostic US of the knee showed mild patellofemoral arthropathy and a small chronic appearing knee effusion. US of the hip showed a CAM type deformity and small anterior acetabular calcification without evidence of full thickness labral tearing. A diagnostic injection of the right knee with 5 mL of 0.5% ropivacaine was performed and the patient was still symptomatic immediately after with 15 minutes of running. Therefore, a diagnostic injection of the hip was performed and the patient was also still symptomatic with 15 minutes of running. She then had Arterial Duplex ultrasound with exertional studies and was found to have normal ABIs on the left with evidence of complete external iliac artery occlusion on right and $<50\%$ stenosis of the left common iliac artery.

Final/Working Diagnosis: Complete right external iliac endofibrosis

Discussion: Iliac artery endofibrosis is a relatively uncommon diagnosis that most commonly affects the proximal 10% of the left external iliac artery, with a 15% bilateral occurrence. Unlike the complete occlusion presented in this case, most cases represented in the literature are incomplete. Unfortunately,

Debilitating Large Muscle Soreness In a High School Football Player

Matthew M. Brown, MD, DPT[1], Andrew M. Watson, MD[2], Kathleen Carr, MD[1,2]
[1]University of Wisconsin-Madison Department of Family Medicine and Community Health
[2]University of Wisconsin- Madison Department of Orthopedics and Rehabilitation

matthew.brown@fammed.wisc.edu

History of Present Illness

- Previously healthy 16 yo male HS offensive lineman
- Presented to PCPs office after developing "cola-colored" urine following practice
- Sx began after the first day of two-a-day practices in the fall
- Soreness of back, legs after the first practice
- After the second practice sx worsened with difficulty walking; that night developed dark urine
- Had been hot, drank/ate minimally during the day
- Had worked out with the team over the summer 3-4x/wk

matthew.brown@fammed.wisc.edu

History of Present Illness

- No other symptoms
- Tx: Ice bath and ibuprofen
- Had similar episodes since middle school with soreness lasting 2-3 days after prolonged exercise.
  - No prior episodes of dark urine

matthew.brown@fammed.wisc.edu

History

- PMH: Acne
- PSH: No previous surgeries
- Allergies: NKDA
- Meds: 1% Clindamycin Gel, 0.05% Topical Treotonin
- FHx: No known autoimmune disease, anesthesia problems or muscle disease. Mother Glaucoma, MGF DM2. Father Hx unknown.
- SHx: HS Junior. Lives with his mothers, one younger sister. Plays Football and basketball. A-student, plans to study engineering in college. Denies use of alcohol, tobacco or other non-prescribed substances or suppliments. Not sexually active.

matthew.brown@fammed.wisc.edu

Physical Exam

VS: Afebrile, BP 132/78, HR 76, RR 16, O2Sat 98% on RA. 198lbs. 5'10" BMI 27
General: Well Appearing NAD
HEENT: PEERL, EOMI, moist mucus membranes
Neck: Supple without lymphadenopathy, thyromegaly or mass
Chest: Lungs CTAB without wheezes rales or rhonchi
CV: RRR, normal S1/S2 without murmur gallop or rub
Abdomen: Soft , non-disteneded, **mild diffuse tenderness. No hepatosplenomegaly or mass**. Normal bowel sounds
Ext: Warm and well perfused, no edema or cyanosis. Distal pulses 2+ B
MSK: Normal muscle tone and bulk with **generalized muscle tenderness particularly of thighs and back**. Large muscle group **strength of the upper arms, hips and thighs 5/5 and painful**.
Skin: Scattered acne on face, back and chest. **No rashes.**
Neuro: Alert and oriented, Mildly anxious. CN2-12 grossly intact. Sensation intact to light touch. Strength 5/5 but painful. No tremor. Reflexes 2+ B

matthew.brown@fammed.wisc.edu

Questions

matthew.brown@fammed.wisc.edu

Differential Diagnosis

- Rhabdomyolysis
  - Exertional
  - Infectious
  - Drug induced (Medications/Illicit Drugs)
  - Connective Tissue Disorders
  - Inherited Gene mutations
    - Metabolic Myopathies
    - Structural Myopathies
    - Channel Related Gene Mutations
- Benign hematuria of exercise
- Glomerulonephritis
- Nephrolithiasis

Tests and Measures

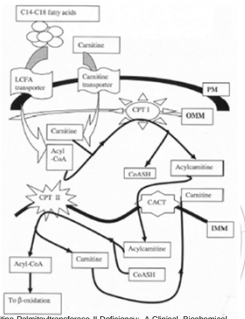
- Na 135 K 3.9 Cl 98 CO2 25 **Cr 0.9 BUN 14 Glu 98**
- **ALT 457 AST 2941 T Bili 1.8, Direct 0.5** Alk Phos 112 Alb 4.9 Prot7.7
- **WBC 15.5 Hgb 17.2** Plt 220
- **CK 31K**
- **UA: 2+ Protein, 3+ Blood, Few RBCs**
- KUB: Negative
- C3 138, C4 23, ASO 505

- TTE: Normal
- Plasma Amino Acids: Normal
- Urine Organic Acids: Normal
- Plasma Very Long Chain Fatty Acids: Normal
- Plasma Acylcarnitines: Elevated

Working Diagnosis

Carnitine Palmitoyltransferase II Deficiency

- Neonatal, infantile hepatocardiomuscular and myopathic forms
- Treated with avoidance of triggers (exercise, fasting, illness), increased calories from carbs, and medium chain triglyceride supplementation



Sigauke E, Rakheja D, Kitson K et. al. Carnitine Palmitoyltransferase II Deficiency: A Clinical, Biochemical, and Molecular Review. Laboratory Investigation 83: 11. 2003

Outcome

- Rhabdomyolysis treated with IV fluids titrated to UOP, pain medication
- Peak CK 51K 12 hours after initial draw; 10K at 24 hours
- Cr stable at 0.9 throughout illness
- Genetics Consult
- Discharge Instructions: Avoid fasts and prolonged vigorous exercise
- Seen by Dietetics as an outpatient; started on MCT oil. CK followed weekly

Return To Play

- CK normalized in 1 week; allowed to return to play with dietary adjustments
- Recurrent Sx during week 5 of the season following a strenuous game followed by an 8 hour work shift the next day without a meal
  - CK of 22K; readmitted for rhabdomyolysis management

THANK YOU

matthew.brown@fammed.wisc.edu
http://www.fammed.wisc.edu

References

- Parekh R Rhabdomyolysis: Advances in Diagnosis and Treatment. Emergency Medicine Practice. 2012, 14 (3).
- Chavez L, Leon M, Einav S et.al. Beyond muscle destruction: a systematic review of rhabdomyolitis for clinical practice. Critical Care. 2016 20:135.
- Scharman E, Troutman W. Prevention of Kidney Injury Following Rhabdomyolysis: A systematic review. Ann of Pharm 2013. 47: 90-105
- Manspeaker S, Henderson K, Riddle D. Treatment of Exertional Rhabdomyolysis in athletes: A systematic Review. JBI Database of Systematic Reviews. 2016. 117-147
- Capacchione J, Muldoon J. The relationship between Exertional Heat Illness, Exertional Rhabdomyolysis and Malignant Hyperthermia. Anesthesia and Analgesia. 2009. 109 (4) 1065-1069
- Latham J, Campbell D, Nichols W. How much can exercise raise creatine kinase level-and does it matter? J of Fam Prac 2008. 57(8): 545-546
- Rigante D, Bersani G, Compagnone A. Exercise-induced Rhabdomyolysis and transient loss of deambulation as the outset of partial carnitine palmityl transferase II deficiency. Rheumatol Int. 2011 31:805-807
- Barca E, Emmanuele V, DiMauro S. Metabolic Myoglobinuria. Curr Neurol Neurosci Rep 2015 15: 69
- CPT II Deficiency. Genetics Home Reference. US National Library of Medicine. https://ghr.nlm.nih.gov/condition/carnitine-palmitoyltransferase-ii-deficiency#diagnosis
- Weiser T, CPT II Deficiency. Gene Reviews. NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK1253/
- www.questdiagnostics.com/testcenter

matthew.brown@fammed.wisc.edu

reimbursement models. However, novel methods are needed to sustain clinical improvements and economic savings.
Acknowledgements: None.

Will Athletes Tell the Truth? A Survey of Mental Health, Alcohol Use and Athletic Consequences for College Athletes Year 3

Margaret E. Gibson, MD, Kristin Duncan, MD, Devin Willis, MD, Jon Schultz, MD, Drew Glover, MD, and Mary Gerkovich, PhD
Affiliation: Department of Family Medicine, Kansas City Missouri Truman Medical Center Lakewood, University of Missouri Kansas City; and Department of Orthopedics, Children's Mercy Hospital, Kansas City, Missouri.

Purpose: NCAA recommends pre-participation (PPE) mental health screening. How to best screen these patients needs to be studied. In year 2 of our study we proved AUDIT-C was a good screen for alcohol use in college athletes. We examined mental health and alcohol use information obtained in anonymous format versus as part of the PPE in order to assess information athletes disclosed when their name associated w/scores.
Methods and Study Design: Data collected from division I to II athletes during annual PPE. An anonymous questionnaire regarding alcohol use, sleep, AUDIT-C questionnaire, PHQ-9 depression screen and practices/games missed taken prior to completing PPE paperwork which included the AUDIT-C and PHQ-9.
Results: Two hundred eight division I athletes completed the anonymous survey and 253 completed the PPE. Analysis of AUDIT-C scores showed risky drinking behavior (>3 females/>4 males) reported by 21% (survey) and 17% (PPE). Hazardous drinking behavior (>5) reported by 6% for both the survey and PPE. AUDIT-C total score trended higher on the survey ($P = 0.08$). The PHQ-9 major depression diagnostic criteria met by 6% on the survey versus 2% on the PPE, a statistically significant difference ($P = 0.025$). Ninty-seven division II athletes completed the survey for a total of 305 collegiate athletes included in the survey analysis. Alcohol use within the past year reported by 59% of athletes. Fifty-one athletes (17%) screened positive for risky drinking based on AUDIT-C score. No relationship found between AUDIT-C scores, hours of sleep or PHQ-9 score and missed practices/games.
Conclusions: No difference in the identification of either hazardous/risky drinking between anonymous survey and PPE. Major depression, however, identified significantly more often when athlete's name omitted.
Significance of Findings: AUDIT-C questionnaire is effective for alcohol use screening in college athletes and when included in the PPE can give useful information about risky/hazardous drinking w/similar results to an anonymous survey. When using PHQ-9 as a depression screen in the PPE students may under report symptoms, further evaluation may be necessary.
Acknowledgments: Gwen Sprague, Hollie McKinney.
Acknowledgements: None.

Establishing an Optimal Aerobic Fitness Measure to Best Predict In-Season Injury Risk in Collegiate Athletes

Matthew M. Brown, DPT, MD and Andrew M. Watson, MD
Affiliation: Department of Family Medicine and Community Health, University of Wisconsin-Madison, Madison, Wisconsin.

Purpose: Previous research demonstrates various aerobic fitness measures predict in-season injuries. This study aimed to determine which measure best predicts injury in collegiate athletes while controlling for the influence of gender.
Methods and Study Design: Fifty-nine NCAA division I soccer (23 male, 20 female) and hockey (16 male) athletes completed pre-season testing for maximal aerobic capacity ($\dot{V}O_2$max) and time to exhaustion (Tmax). $\dot{V}O_2$max was expressed absolutely and relative to body mass (BM) and lean body mass (LBM). Injuries were recorded during the subsequent seasons, and fitness variables were compared between injured and uninjured players. Fitness measures were converted to z-scores and logistic regression models were developed to compare the relative ability to predict injury while controlling for gender effects.
Results: Injured players demonstrated significantly lower fitness than uninjured players with respect to Tmax (16.2 vs 17.6 minutes, $P = 0.028$), absolute $\dot{V}O_2$max (4.32 vs 4.79 L/min, $P = 0.015$) and $\dot{V}O_2$max normalized by BM (58.2 vs 62.4 $mL \cdot kg^{-1} \cdot min^{-1}$, $P = 0.038$) and LBM (76.3 vs 80.0 $mL \cdot kgLBM^{-1} \cdot min^{-1}$, $P = 0.044$). Univariable logistic regressions to predict injury found significant and similar influences of Tmax (OR = 0.48, $P = 0.019$), absolute $\dot{V}O_2$max (OR = 0.51, $P = 0.025$), and $\dot{V}O_2$max normalized to BM (OR = 0.51, $P = 0.027$) and LBM (OR = 0.53, $P = 0.031$), as well as a non-significant trend for increased risk of injury among females (OR = 2.7, $P = 0.087$). After inclusion in separate multivariable models with gender as a covariate, only $\dot{V}O_2$max normalized to LBM remained a significant predictor of injury (OR 0.91, $P = 0.036$), while the other fitness measures did not ($P > 0.05$ for all).
Conclusions: Although multiple fitness measures are similarly associated with injury in college athletes, $\dot{V}O_2$max normalized to LBM was the only measure that remained independent of the effect of gender.
Significance of Findings: Pre-season metabolic fitness testing combined with body composition testing may improve the prediction of in-season injury risk in male and female collegiate athletes.
Acknowledgements: None.

Early Pediatric Sports Specialization in Professional Ice Hockey Players

Sarah Black, BA, Matthew Silvis, MD, Kevin P. Black, MD, and Aman Dhawan, MD
Affiliation: Penn State College of Medicine, Hershey, Pennsylvania.

Purpose: Pediatric sports specialization, intense year round training in a single sport as a result of excluding other sports for greater than 8 mo/yr, is common practice in the United States. Current arguments against early sports specialization (before age 13) include: avoidance of overuse injuries, cross sport skill development, and prevention of social isolation and burnout. Anecdotally, study authors have noted early diversification with delayed sports specialization amongst professional hockey players. As many parents feel early sports specialization is critical for success, this information could have significant implications. This study aimed to define when professional hockey players specialize in ice hockey.
Methods and Study Design: Cross sectional survey. After IRB approval and informed consent, male professional ice hockey players of one organization aged 18 years and over completed a survey at training camp detailing their history of sports participation. Data were analyzed by descriptive statistics.
Results: 45 athletes participated in the study, average age 24.9 years. Nine players had at least one sibling who also played a professional sport. Eight players reported having a parent who played a professional sport. Average age of participation in organized sports: 4.64 years. Forty-two athletes participated in at least one other sport as a child with the most common sport being soccer. Average age of sports specialization: 14.1 years with a range of 5 to 23; 24% specializing before age 14. Forty-one players reported "self" as the strongest motivating factor behind their decision to specialize in ice hockey. The most commonly reported injury was concussion (47% reporting during their career).
Conclusions: Our findings indicate that early sports specialization is not common in professional ice hockey players.
Significance of Findings: These findings imply that early pediatric sports specialization before age 14 is not necessary for athletic success and emphasize the importance of diverse sports participation during youth to avoid injury and psychological burnout.
Acknowledgements: We would like to thank the head athletic trainer for the Hershey Bears Hockey Club, Daniel Stuck, for his assistance in data collection.

Same-Day Return to Play Following Sports-Related Concussion in Pediatric Athletes

Shane M. Miller, MD, Meagan J. Sabatino, BA, and Aaron J. Zynda, BS
Affiliation: Texas Scottish Rite Hospital for Children, Dallas, Texas.

Establishing an Optimal Aerobic Fitness Measure to Predict In-Season Injury in College Athletes

Matthew M. Brown, MD, DPT[1], Andrew M. Watson, MD[2]
[1]University of Wisconsin-Madison
Department of Family Medicine and Community Health
[2]University of Wisconsin-Madison Department of Orthopedics and Rehabilitation

Background

- Injuries are common in college athletics occurring between 1.9 and 35.9 injuries per 1000 exposures depending on sport and season[1]
- In-season injuries impair athletes and their teams' athletic success and can adversely affect long term health[2,3]
- Previous studies have looked for and identified numerous risk factors for in-season injury[4-8]
- Aerobic Fitness has been shown to be an independent predictor of in-season injury[6-9]
- No study has identified the best aerobic fitness measure to predict in-season injury.

1. Hootman 2007 2. Smith 2017 3. Arnason, 2004 4. Arnason 2005 5. Grant 2015 6. Gastin 2015 7. Bell 2000 8. Knapik 2001, 9. Watson 2015

Purpose

- To determine an aerobic fitness measure that best predicts in-season injuries in collegiate athletes.

Design and Subjects

- Prospective Cohort
- 59 NCAA Div 1 Athletes
  - Soccer: 23 male, 20 female
  - Hockey: 16 male
- Collected data on pre-season aerobic fitness and body composition as well as in-season injuries

Fitness Measures

- Aerobic Fitness
  - Progressive Maximal Treadmill Test
    - Modified Bruce Protocol to maximal exercise tolerance
    - VO2 Max, Ventilatory Threshold, Time to Ventilatory threshold, Time to Exhaustion
      - Measured using 30s rolling average for VO2 Max and Ventilatory Threshold measures
- Body Composition
  - Dual-energy x-ray absorptometry
    - Weight, bone mass, LBM, body fat
    - Expressed as absolute masses and percentages

Injuries

- Injuries in practice or games
- Recorded by each teams athletic trainer
  - Any injury that both:
    - Occurred in practice or a game
    - Resulted in a missed practice or game

Statistical Analysis

- VO2 Max and Ventilatory Threshold expressed absolutely and relative to body mass and lean body mass
- Fitness and body composition variables compared between injured and uninjured using Wilcoxon Rank Sum Tests
- Fitness variables converted to z-scores and separate univariable logistic regressions were used to compare their relative ability to predict injury
- Separate multivariable logistic regressions created to compare the fitness variables after controlling for gender differences.

matthew.brown@fammed.wisc.edu

Comparison of Fitness Measures

	Injured (n=32)	Uninjured (n=27)	p
Lean body mass (kg)	56.8 (10.4)	60.2 (9.1)	0.11
Lean body mass (%)	76.5 (5.7)	78.1 (5.4)	0.25
Bone mass (kg)	3.25 (0.49)	3.46 (0.50)	0.11
Bone mass (%)	4.41 (0.34)	4.50 (3.7)	0.35
Body fat (kg)	13.9 (3.8)	13.3 (4.1)	0.52
Body fat (%)	19.1 (5.8)	17.4 (5.6)	0.21
VO2max (L/min)	**4.32 (0.81)**	**4.79 (0.66)**	**0.015**
VO2max (ml/kg/min)	**58.2 (6.96)**	**62.4 (6.5)**	**0.038**
VO2max (ml/kgLBM/min)	**76.25 (6.87)**	**80.03 (5.62)**	**0.044**
Time to exhaustion (min)	**16.19 (2.05)**	**17.55 (2.0)**	**0.028**
Time to VT (min)	**10.07 (1.51)**	**11.06 (2.08)**	**0.041**
VT (L/min)	**3.1 (0.62)**	**3.45 (0.67)**	**0.020**
VT (ml/kg/min)	41.89 (6.35)	44.83 (6.79)	0.21
VT (ml/kgLBM/min)	54.85 (7.30)	57.27 (6.58)	0.470
VT (% of max)	71.85 (5.78)	71.87 (7.57)	0.980
Male (%)	18 (56%)	21 (78%)	0.082
Soccer (%)	25 (78%)	18 (67%)	0.324

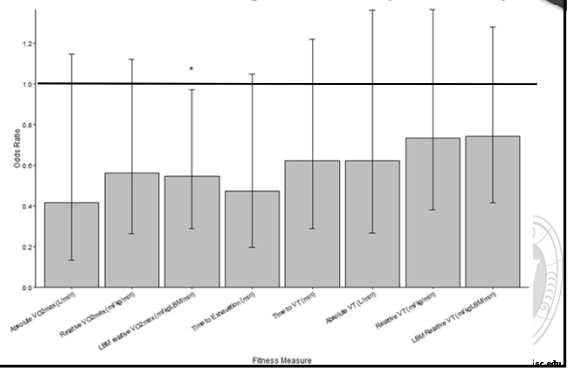
matthew.brown@fammed.wisc.edu

Univariable Regression

	OR	*p*
VO2max (L/min)	***0.51 (0.27-0.89)***	***0.025***
VO2max (ml/kg/min)	***0.51 (0.27-0.90)***	***0.027***
VO2max (ml/kgLBM/min)	***0.53 (0.28-0.92)***	***0.031***
Time to exhaustion (min)	***0.48 (0.24-0.85)***	***0.019***
Time to VT (min)	***0.55 (0.28-0.95)***	***0.047***
VT (L/min)	***0.46 (0.30-0.97)***	***0.048***
VT (ml/kg/min)	*0.63 (0.35-1.07)*	*0.096*
VT (ml/kgLBM/min)	0.70 (0.39-1.2)	0.19
VT (% of max)	1.00 (0.59-1.68)	0.99
Male (%)	***2.72 (0.89-9.1)***	***0.087***
Soccer (%)	1.79 (0.56-5.90	0.33

matthew.brown@fammed.wisc.edu

Multivariable Regressions (z-scores)



isc.edu

Multivariable Regression

	OR	p
VO2max (ml/kgLBM/min)	**0.91 (0.83-0.99)**	**0.036**
VO2max (L/min)	0.32 (0.07-1.2)	0.10
VO2max (ml/kg/min)	0.92 (0.83-1.02)	0.11
Time to exhaustion (min)	0.70 (0.46-1.02)	0.077
Time to VT (min)	0.77 (0.51-1.11)	0.19
VT (L/min)	0.49 (0.13-1.6)	0.25

matthew.brown@fammed.wisc.edu

Discussion

- Multiple aerobic fitness measures are associated with injury
- VO2 max normalized to lean body mass is the only measure that is associated with injury when accounting for gender
- Pre-Season fitness testing using VO2 Max combined with body composition testing may improve prediction of in season injury. This could be used to help target interventions to reduce injuries in athletes at risk. (Heidt, 2000)

matthew.brown@fammed.wisc.edu

Limitations

- Small sample size
  - Does not identify type or severity of injury
  - Difficult to quantify other risk factors that may co-variate with fitness
- Limited ability to generalize to other groups of athletes/sports
- Difficult to implement findings outside of the ability to perform metabolic fitness testing
  - Trend toward significance for time to exhaustion may identify a low cost alternative.

Conclusions

- VO2 max normalized to lean body mass is the fitness measure that best predicts injury in collegiate athletes in that it remains the only measure that is associated with injury when accounting for gender

THANK YOU

matthew.brown@fammed.wisc.edu
http://www.fammed.wisc.edu

References

- Hootman J, Dick R, Agel J. Epidemiology of Collegiate Injuries for 15 Sports: Summary and Recommendations for Injury Prevention Initiatives. J Athl Train. 2007. 42(2). 311-319
- Smith, M, Nepple J, Wright R Knee Osteoarthritis Is Associated with Previous Meniscus and Anterior Cruciate Ligament Surgery Among Elite College American Football Athletes. Sports Health 2017. 9(3):247-251
- Arnason A, Sigurdsson S, Gudmundsson A et.al. Physical Fitness, Injuries and Team Performance in Soccer. Med and Sci in Sports and Exer. 2004 36(2): 278-285
- Arnason A, Sigurdsson S, Gudmundsson A et.al. Risk Factors For Injuries in Football. Amer J Sports Med Jan-Feb 2005. 32(1)
- Grant J, Bedi A, Kurz J, et.al. Ability of preseason body composition and physical fitness to predict the risk of injury in male collegiate hockey players. Sports Health. 2015 Jan;7(1):45-51.
- Gastin PB, Meyer D, Huntsman E, Cook J. Increase in injury risk with low body mass 340 and aerobic-running fitness in elite Australian football. *Int J Sports Physiol Perform. 341 May 2015;;10(4):458-463.*
- Bell N, Mangione T, Hemenway D et.al. High injury rates among female army trainees: a function of gender? Am J Prev Med. 2000. 18(3):141-6
- Knapik J, Sharp M, Canham-Chervak, et.al. Risk factors for training related injuries among mend and women in basic combat training. Med and Sci in Sports and Exer. 2001. 946-954
- Watson A, Brindle J, Brickson S et. Al. Preseason Aerobic Capacity Is an Independent Predictor of In-Season Injury in Collegiate Soccer Players. Clin J Sport Med. 2016
- Heidt R, Sweeterman L, Carlonas R et.al. Avoidance of soccer injuries with preseason conditioning. Am J Sports Med. 2000 Sep-Oct;28(5):659-62.
- Shojaedin S, Letafatkar, Hadadnezhad M et.al. Relationship between functional movement screening score and history of injury and identifying the predictive value of the FMS for injury. Int J Inj Contr Saf Promot. 2014;21(4):355-60.
- Theiss J, Gerber J, Cameron K et.al. Jump-landing differences between varsity, club, and intramural athletes: the Jump-ACL Study. J Strength Cond Res. 2014 Apr;28(4):1164-71.
- Roussel N, Vissers D, Kuppens K, et.al. Effect of a physical conditioning vs health promotion intervention in Dancers. A Randomized Controlled Trial. Man Ther 2014. 19: 562-568.

Anna Chase, MD

A native of Michigan, Anna grew up in the Upper Peninsula along Pictured Rocks National Lakeshore, which instilled in her a love for camping, skiing, and the great outdoors. She completed her bachelor's degree in Brain Behavior and Cognitive Science at the University of Michigan in Ann Arbor before moving on to Wayne State University School of Medicine. While in medical school, Anna traveled to Peru on a medical mission trip, where she delivered basic medical treatments to a local clinic and taught physical therapy techniques to local weavers. Back in Detroit, Anna regularly volunteered at a free clinic caring for patients with chronic diseases. These experiences, along with seeing the value of a continuity-of-care relationship with her own family physician while growing up, have drawn Anna to family medicine. She is also attracted to family medicine for the breadth of fields it covers, and has particular interests in women's health and reproductive health. Outside of medicine, Anna enjoys sewing, hiking, yoga and craft beer.

Projects Completed During Residency:

Community Health Learning Experience:

An Integrated Approach to Reducing Food Insecurity at Lakeview Elementary School

Scholarly Project:

Using EITC to Improve Access to Food and Reduce Food Insecurity:

Together with Dr. Dubal, I performed a single-site, prospective cohort study to evaluate utilization and knowledge of Earned Income Tax Credit (EITC). Surveys were distributed to parents at Lakeview Elementary parent-teacher nights to determine if parents would benefit from more information regarding EITC. Our assessment showed that families were in fact interested in receiving additional information. We then created educational materials to distribute to families. Our next steps are to analyze the impact on utilization of EITC, work to expand EITC sites to improve access to families, and determine whether EITC utilization rates have an impact on food insecurity.

Thank you to my family, friends, and partner for the endless support during these many years of training. I am grateful for the education and guidance I received through the faculty and staff at this department, in particular from those at Northeast Clinic. Thanks to my residency cohort for post-conference cathartic beers, kayaking, and of course for the annual pontooning.

An Integrated Approach to Reducing Food Insecurity at Lakeview Elementary School.

Background/Objectives: A large proportion of Wisconsin households and the children within these households experience food insecurity. According to Feeding America, more than 12% of Wisconsin households 20% of children are food insecure. In Dane County, these rates are 11% and 17%, respectively. The goal of this project was to determine if a combined food box program along with educational supplementation reduced rates of food insecurity at a local elementary school. Previous research had already shown that families of Lakeview Elementary School identified food insecurity as an issue.

Methods: Single-site, quasi-experimental pre-post study. *Setting / Intervention*: Families from a local elementary school with high rates of impoverishment were selected to receive a weekly healthy food box and were given educational information about local food pantries. *Participants:* 56 families were surveyed and received educational material. 9 families were selected to receive a food box. Families who received the food box were pre-selected via enrollment in the Transition Education Program. *Main Outcomes / Measures*: Surveys assessed food insecurity, knowledge of local food pantries, and utilization of these pantries. Outcomes were assessed by re-distributing the surveys following intervention. These were analyzed using chi-squared contingency table.

Results: While overall rates of food insecurity dropped from 57% to 41% with the above intervention, this difference was not found to be statistically significant ($p>0.05$). We also analyzed secondary outcomes in the food insecure subgroup. A pre- and post-intervention comparison demonstrated decreased rates of individuals listing the following barriers: knowledge of resources, transportation, and financial security. However, these results were not statistically significant. Of note, there was a significant ($p=.007$) increase in families reporting lack of knowledge on how to prepare healthy foods.

Conclusions: In this limited study, direct delivery of food boxes and information on food pantries to food insecure families did not seem to have significant impact on overall food security. Even if it did have an impact, a direct food delivery program would have significant limitations in scalability. A major limitation to this study was the limited power and sample size. This project helped us learn about the many challenges and barriers that arise when trying to solve community problems. Some of the challenges faced by our team included limited translation services (Hmong, Arabic for example), difficulty arranging meetings with all players involved in this project, and buy-in from stakeholders. More research is needed to discover efficient and effective programs that target food insecurity including. Possible areas to explore in the future include cooking classes, food backpack programs, and monetary programs. The results of this study and the latest research led us to transition our focus to addressing food insecurity via EITC.

Acknowledgements: Jennifer Edgoose, Kristi Kloose, Megan Lasch, Andrea Draeger and Second Harvest food bank.

Northeast Clinic is working to connect community members to available resources. One such resource is the Earned Income Tax Credit. Only 1 out of 5 of those who qualify for this credit are benefiting from m it. Briefly: Earned income tax credit (EITC) is a tax refund based on income and number of children in a household.

1. Have you heard of the earned income tax credit before?
   - ☐ YES
   - ☐ NO
2. Have you benefitted from this tax credit in the past?
   - ☐ YES
   - ☐ NO
   - ☐ NOT SURE
3. Are you interested in learning more about this tax credit?
   - ☐ YES
   - ☐ NO
   - ☐ NOT SURE
4. Would you be interested in help applying for this tax credit?
   - ☐ YES
   - ☐ NO
   - ☐ NOT SURE
5. Additional comments?

_____

_____

_____

If you would like to us to reach out to you regarding the Earned Income Tax Credit, please leave your name and a way to contact you.

Name and Contact: _____

Thank you for completing this survey!

Earned Income Tax Credit (EITC)
Volunteer Income Tax Assistance (VITA)

For Fiscal Year 2017

The VITA program provides free basic tax preparation.The EITC is tax benefit for qualifying working families with at least one qualifying child.

To qualify for EITC, you must meet the following requirements:

1) Have at least one qualifying child. Rules on Qualifying children can be found at: https://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/qualifying-child-rules
2) Be a full-year Wisconsin resident.
3) File a joint return if you are married.

What are the Income requirements?

If filing...	Qualifying Children Claimed		
	One	Two	Three or more
Single, Head of Household or Widowed	$39,617	$45,007	$48,340
Married Filing Jointly	$45,207	$50,597	$53,930

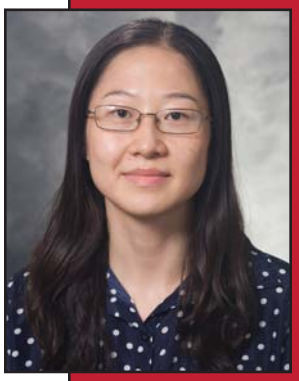
VITA Sites

Lakeview Library - 2845 N Sherman Ave
Call 608-246-4547 to make an appointment, or visit the library website at http://www.madisonpubliclibrary.org/special-series/tax-assistance
You can find additional sites by doing any of the following:
Call (800) 906-9887, or (608) 266-2486, or dialing "211"
Visit https://irs.treasury.gov/freetaxprep/

What Should I Bring?

Photo identification
Social security cards for you, your spouse and your dependents
All wage and tax statements, including Forms W-2, W-2G, 1099-R, SSA-1099
Interest and dividend statements
Any other tax documents you received

Lydia Chen, MD



Lydia Chen was born in China and moved to the Chicago area with her parents when she was 11 years old. She earned her bachelor's degree in Biochemistry from the University of Illinois—Chicago, and completed her medical degree at the University of Illinois College of Medicine. During her undergraduate years, Lydia spent a year deployed to Afghanistan as a member of the Illinois Army National Guard, where she served as the Sergeant of the Guard, working with the tower guards and entry control point soldiers to ensure the safety of the military base. Later, as a medical student, she joined the Illinois SEARCH program where she gained exposure to underserved medicine through visiting FQHCs that work with inner city populations, migrant farm workers, LGBT populations, and refugee populations in the Chicago area. She also volunteered regularly at a student-run free clinic on Chicago's North side. Lydia is interested in full-spectrum family medicine, with additional interests in integrative, academic, and sports medicine. In her free time, she enjoys traveling, exploring new restaurants, museums, running, swimming, biking, and improving her culinary skills.

Projects Completed During Residency:

Community Health Learning Experience:

Market Basket and Health Squad

Scholarly Project:

Does Maternal Nitrofurantoin Use in Pregnancy Have Long-Term Health Effects on the Child?:

Better evidence is needed to assess if nitrofurantoin use in pregnancy has long term health effects on the child. A case-controlled study reported nitrofurantoin use was associated with oral clefts in the offspring. A large cohort study reports no association between nitrofurantoin and risk of major malformations. A meta-analysis included 8 studies; 5 cohort studies showed no association and 3 case-controlled studies resulted in an overall OR of 1.22, suggesting a marginally elevated risk that is not shown among cohort studies. The September 2017 ACOG committee opinion states prescribing nitrofurantoin in the first trimester is still considered appropriate when no other suitable alternative antibiotics are available. During the second and third trimester, nitrofurantoin may continue to be used as first-line agents for the treatment and prevention of urinary tract infections and other infections caused by susceptible organisms.

Thank you to the amazing DFMCH faculty and staff for your mentorship, support, and teachings. Thank you to my co-residents for being there and going through this journey together. Thank you to my husband, Jody, for his love and support through my medical training. I could not have done it without you all.

Market Basket and Health Squad

Background:

The market basket project took place in the Wingra clinic. The identified issue was health disparity in access to healthy food in the area surrounding Wingra clinic. There is only one small grocery store (Pick & Save) within the area. The identified population was patients of Wingra clinic. UW undergraduate students were involved in identifying the problem.

The Health Squad project takes place at the Dane County Boys & Girls Club, which is located off of South Park Street, within ten minutes drive from the Wingra Clinic. The identified issue was socioeconomic inequality on children's food choices. The population involved is children age 6-10 in the south Madison neighborhood who are members of the Dane County Boys & Girls Club. UW undergraduate and graduate students are involved.

Objectives:

Both project focus on nutrition and access to healthy food. The goal is to provide education on healthy options, recipes, and exposure to nutritious food.

For the Market Basket project, the objectives are: 1) provide education about nutrition and food to Wingra patients and 2) connect them to an affordable fresh food resource. My role in the Market Basket project was to facilitate interactions between Wingra patients and the student educators, spread awareness among providers, staff regarding schedule of the project and updates, meeting with student leaderships to discuss patient education plans.

My role in the Health Squad was to teach nutrition and facilitate fun activities on healthy eating to children who belong to the Boys and Girls Club. Each session has a theme around healthy food options and the facilitators of the session bring in fruits or other healthy snacks for children to try, exposing children to nutritious food. Healthy snack recipes are shared with children and they bring recipes home to make with their parents.

Methods:

I started out each project by meeting with the student leadership and discussing ways I can contribute. Then I participated in the sessions, meeting with student leadership to discuss next steps, and leading certain sessions.

Results:

Both the Market Basket and Health Squad projects raised awareness in the community on healthy eating. The Market Basket provided affordable fresh produce to Wingra patients, students discussed recipes using the produce, and provided nutrition education. The Health Squad has been well received and has established a good relationship with the Dane County Boys & Girls Club. We hope that our involvement have made an impact in the children on their food selections and indirectly on the food their parents will choose for them.

Conclusion:

I learned that as young physicians we can make an impact in the community through outreach programs. Some challenges include time, correlating my schedule with the students'

schedules, and acquiring fresh affordable produce for patients. It has been an interesting experience teaching young children about nutrition. I found the most effective way is to expose them to tasty snacks and fun activities.

I would recommend formal surveys for participants in both programs to find ways to improve the projects.

Acknowledgements:

UW undergraduate and graduate students, Dane County Boys & Girls Club, Jonas Lee, Kirsten Rindflesich.

Allison Couture, DO

Allison Couture grew up in Appleton, Wisconsin, and she earned her bachelor's degree from the University of Notre Dame in Indiana. She then went on to complete her medical degree at the Chicago College of Osteopathic Medicine of Midwestern University. She was drawn to Family Medicine as the specialty that best encompasses her strong interests in obstetrics and pediatrics, and much of her volunteer work has focused on children. As a medical student, she volunteered at Almost Home Kids, a transition home for medically fragile children in need of care and access to advanced medical equipment. She also served as president of her local chapter of the Student Osteopathic Pediatric Association. In this role she organized monthly events and established an annual Bullying Awareness Discussion Panel. Her interest in maternal and child health has also inspired an interest in advocacy, and she traveled to Washington DC to advocate for health policy changes as part of the DO Day on the Hill. In her free time, Allison enjoys yoga, baking cakes, and watching the musical theatre productions of her husband.

Projects Completed During Residency:

Community Health Learning Experience:

ChopChop Cooking Club

Scholarly Project:

OMT4MD Educational Lectures and Lab Leader:

As a part of the newly designed resident and faculty curriculum, Osteopathic Manipulative Treatment for the Allopathic Physician (OMT4MD), I created two educational lectures for participants to review prior to an in-person lab session. My lectures taught the diagnosis and treatment of cervical and lumbar somatic dysfunction. I then led the corresponding hands-on lab sessions, teaching participants the skills and techniques most useful for them to implement osteopathic manipulative treatment into their own continuity clinic. This curriculum is now in its second year, and I was able to participate in both 2017 and 2018 courses. Creation of these lectures was facilitated by my time during a Resident as Teacher outpatient elective.

To my husband, family, and friends. Your ongoing support of my journey means the world to me. Thank you and I love you.

ChopChop Cooking Club

Background: In 2016, the USDA reported that 16.5% of children under 18 in the US live in households where they are unable to consistently access enough nutritious food necessary for healthy life.[1] Families in Dane County are not excluded from this statistic. Using the ChopChopKids platform, whose mission is to promote healthy eating by teaching children and their families how to cook meals together, my community health project was to create cooking classes for families in Dane County. This project addressed community health by cultivating a positive experience around cooking and eating healthy foods with friends and family in a way that also promotes multi-faceted education. Specifically, partnering local community healthcare providers with the population they serve would offer the opportunity for us to see how diverse populations interact when brought together around cooking. All families regardless of socioeconomic levels were invited to participate, and the classes were held at a local food pantry, the Badger Prairie Needs Network. BPNN serves many of Verona, Fitchburg, and Madison areas' low and very low-income households, which addresses the needs of those families most at risk for food insecurity.

Objectives: The goal of my project was to help families understand the importance of a diet rich in fruits and vegetables. I also worked to identify and access free educational resources to inspire local community families to cook real, nutritious food together.

Methods: Over the course of 2017, three different sessions were hosted at BPNN. Each session consisted of a series of 4 classes targeted at children ranging ages 5-13 years old. The food was purchased at HyVee and kitchen tools were supplied by the BPNN community kitchen. Each session was 60-90 minutes long and consisted of an educational activity followed by cooking a recipe together. All resources were freely downloaded from ChopChopMag.org's website, which promotes use of their materials to help encourage healthy eating. Pre and post course surveys were collected to gather information about how this course impacted family and children's cooking habits. Each participant was asked to donate to the BPNN if able as a thank you for letting us use their kitchen.

Results: Children and their families learned how to grate beets into veggie wraps, chiffonade lettuce for quesadillas, and measure fruit to blend into smoothies during these sessions. A positive response to family cooking was evident. Pre and post-surveys evaluated the effectiveness of the classes. 73.0% of parents reported their child learned a great deal about eating fruits and vegetables. 85.7% of parents reported development in their child's ability to cook. 55.0% of parents reported that the course developed their ability to cook.

Conclusions: The ChopChop Cooking Club created a fun learning environment, where families enjoyed exploring new ways to cook with fruits and vegetables. Participant reviews of the course were positive, "Very organized from marketing, sign up, ongoing communication, and actual class. Great instructors. Supportive, friendly, and fun!" "[A strength of the ChopChop Cooking club was] giving small children the opportunity to cook and use tools in the kitchen." "Good exposure to cooking new foods." Post course surveys did not show a significant increase in fruit or vegetable consumption at the end of the sessions. This was inconsistent with recent research findings, which report that taste testing various fruits and vegetables is associated with increased fruit and vegetable consumption. However small sample size and <100% participant retention were likely contributing factors. After the first session, we learned that

despite the overarching goal of having family units cooking together, there were basic skill differences between the younger and older kids. This difference caused us to split into two age groups for the next two sessions, 5-8 and 9-13 years old. We were able to use more age appropriate recipes in these sessions allowing children to fully participate. The course was also an effective way for residents and faculty to engage in community health. Next steps include presenting a poster of this project at the Society of Teachers of Family Medicine and reaching out to ChopChop directly to expand accessibility of the course.

Acknowledgments: ChopChopMag.com, Badger Prairie Needs Network, Marcia Kasieta, Mike McKinney, Kara Hoerr, Maggie Larson, Brian Arndt, all other group leaders who participated. Microgrant funding through the UW Department of Family Medicine and Community Health.

Early ChopChop-ing of Fruits and Vegetables Increases Learning Amongst Children

Allison Couture, DO;
Brian Arndt, MD; Maggie Larson, DO

Department of Family Medicine and Community Health
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

UW Department of Family Medicine and Community Health

Introduction

- 16.5% of children under 18 in the US live in households where they are unable to consistently access enough nutritious food necessary for healthy life.[1]
- The national database *What Works for Health* shows there is 'some evidence' that taste testing fruits and vegetables increases consumption among children, adolescents, and adults.[2,3,4]
- ChopChopKids is a national, non-profit organization that teaches children and their families how to cook healthy meals together.
- For a UW Department of Family Medicine and Community Health residency QI project, a ChopChop Cooking Club was created for families in Dane County hosted by a local food pantry.

Objectives

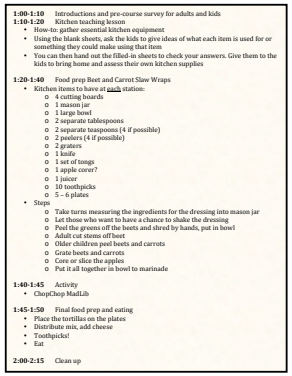
- Understand the importance of a diet rich in fruits and vegetables for a family unit
- Identify and access free educational resources to inspire community families to cook real, nutritious food together

Materials & Methods

- Children ages 5-12 years old with parents attended a series of 4 classes in 4 months
- Collected pre/post-course surveys to evaluate fruit/vegetable consumption and cooking skills
- Project was funded for 1 year with $1500 micro grant from the UW DFMCH (food purchases, kitchen supplies, marketing)

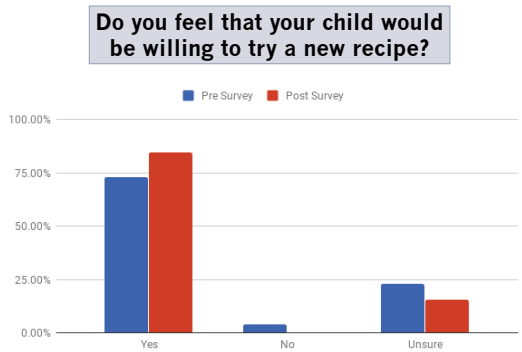
Class Poster

Class Outline



Results

- Child participants: **46** Number of sessions: **14**
  Parent participants: **51** Money donated: **$315**
- 73.0% of parents reported their child learned a great deal about eating fruits and vegetables
- 85.7% of parents reported development in their child's ability to cook
- 55.0% of parents reported that the course developed their ability to cook



Graph 1: Recipe Willingness Pre- vs Post-

Participant Reviews

- "Very organized from marketing, sign up, ongoing communication, and actual class. Great instructors. Supportive, friendly, and fun!
- "[A strength of the ChopChop Cooking club was] giving small children the opportunity to cook and use tools in the kitchen."
- "Good exposure to cooking new foods."

Discussion

- The ChopChop Cooking Club created a fun learning environment, where families enjoyed exploring new ways to cook with fruits/vegetables
- A positive response to family cooking was evident
- Essentially no change fruit/vegetable consumption
  → Limitations: small group size, high health literacy, <100% retention
- Surveys showed that kitchen programming was associated with improved cooking skills for kids & adults, which is consistent with studies.
- Participating in community kitchen programming has been associated with enhanced food skills, improved community food security, and improved social interactions.[5,6]
- The course was an effective way for residents and faculty to engage in community health.

Clinics can order 50 free copies!

Resources

ChopChopMag.org

1. Alisha Coleman-Jensen, Matthew P. Rabbitt, Christian A. Gregory, and Anita Singh. 2017. Household Food Security in the United States in 2016, ERR-237, U.S. Department of Agriculture, Economic Research Service.
2. Cooke L. The importance of exposure for healthy eating in childhood: A review. Journal of Human Nutrition and Dietetics. 2007;20(4):294-301.
3. Knai C, Pomerleau J, Lock K, McKee M. Getting children to eat more fruit and vegetables: A systematic review. Preventive Medicine. 2006;42(2):85-95.
4. French SA, Stables G. Environmental interventions to promote vegetable and fruit consumption among youth in school settings. Preventive Medicine. 2003;37(6):593-610.
5. Iacovou M, Pattieson DC, Truby H, Palermo C. Social health and nutrition impacts of community kitchens: A systematic review. Public Health Nutrition. 2013;16(3):535-43.
6. Robson SM, Stough CO, Stark LJ. The impact of a pilot cooking intervention for parent-child dyads on the consumption of foods prepared away from home. Appetite. 2016;99:177-184.
7. Photos by Kate Newton.

Milap Dubal, MD

Milap Dubal spent his formative years in St. Louis, Missouri, and Cary, North Carolina. He earned undergraduate degrees in Biology and Psychology from St. Louis University, and returned to SLU for Medical School. Between his third and fourth year of medical school he also completed a MPH at the University of North Carolina in Chapel Hill. Milap is drawn to family medicine for its focus on caring for the whole patient, as well as its emphasis on public health, prevention, and caring for underserved populations. As a medical student he served as Co-President of the Global Health Learning Community, and he created a "Distinction in Global Health" for St. Louis University medical students. He also partnered with the International Institute of St. Louis to develop a health education course for refugees. While earning his MPH, he studied food access and discovered that neighborhood and food retail store characteristics can predict obesity status. In his spare time, Milap enjoys cooking and baking, participating in outdoor activities, and playing basketball and board games. Milap also appreciates good beer and cheese (a Badger at heart, perhaps?)

Projects Completed During Residency:

Community Health Learning Experience:

An Integrated Approach to Reducing Food Insecurity at Lakeview Elementary School

Scholarly Project:

Using EITC to Improve Access to Food and Reduce Food Insecurity:

Together with Dr. Chase, I performed a single-site, prospective cohort study to evaluate utilization and knowledge of Earned Income Tax Credit (EITC). Surveys were distributed to parents at Lakeview Elementary parent-teacher nights to determine if parents would benefit from more information regarding EITC. Our assessment showed that families were in fact interested in receiving additional information. We then created educational material to distribute to families. Our next steps are to analyze the impact on utilization of EITC, work to expand EITC sites to improve access to families, and determine whether EITC utilization rates have an impact on food insecurity.

Thank you to Dr. Edgoose for her ongoing support and advice and to Dr. Chase for her commitment to this project. And thank you to the staff at Lake View Elementary and Second Harvest Food Bank for their dedication to the children at Lake View Elementary.

An Integrated Approach to Reducing Food Insecurity at Lakeview Elementary School

Background/Objectives: A large proportion of Wisconsin households and the children within these households experience food insecurity. According to Feeding America, more than 12% of Wisconsin households 20% of children are food insecure. In Dane County, these rates are 11% and 17%, respectively. The goal of this project was to determine if a combined food box program along with educational supplementation reduced rates of food insecurity at a local elementary school. Previous research had already shown that families of Lakeview Elementary School identified food insecurity as an issue.

Methods: Single-site, quasi-experimental pre-post study. *Setting / Intervention*: Families from a local elementary school with high rates of impoverishment were selected to receive a weekly healthy food box and were given educational information about local food pantries. *Participants:* 56 families were surveyed and received educational material. 9 families were selected to receive a food box. Families who received the food box were pre-selected via enrollment in the Transition Education Program. *Main Outcomes / Measures*: Surveys assessed food insecurity, knowledge of local food pantries, and utilization of these pantries. Outcomes were assessed by re-distributing the surveys following intervention. These were analyzed using chi-squared contingency table.

Results: While overall rates of food insecurity dropped from 57% to 41% with the above intervention, this difference was not found to be statistically significant ($p>0.05$). We also analyzed secondary outcomes in the food insecure subgroup. A pre- and post-intervention comparison demonstrated decreased rates of individuals listing the following barriers: knowledge of resources, transportation, and financial security. However, these results were not statistically significant. Of note, there was a significant ($p=.007$) increase in families reporting lack of knowledge on how to prepare healthy foods.

Conclusions: In this limited study, direct delivery of food boxes and information on food pantries to food insecure families did not seem to have significant impact on overall food security. Even if it did have an impact, a direct food delivery program would have significant limitations in scalability. A major limitation to this study was the limited power and sample size. This project helped us learn about the many challenges and barriers that arise when trying to solve community problems. Some of the challenges faced by our team included limited translation services (Hmong, Arabic for example), difficulty arranging meetings with all players involved in this project, and buy-in from stakeholders. More research is needed to discover efficient and effective programs that target food insecurity including. Possible areas to explore in the future include cooking classes, food backpack programs, and monetary programs. The results of this study and the latest research led us to transition our focus to addressing food insecurity via EITC.

Acknowledgements: Jennifer Edgoose, Kristi Kloose, Megan Lasch, Andrea Draeger and Second Harvest food bank.

Mathew Herbst, MD

Projects Completed During Residency:

Scholarly Project:

BPPV Evaluation and Treatment

Scholarly Project:

Internship Prep Course Preceptor:

As an Internship Prep Course preceptor I was a part of a great group of residents that taught 4th year medical students, whom had matched into family medicine, some of the basic skills and fund of knowledge that will be required in the next step of their medical education. I created interactive lectures to teach students about how to form a process to quickly review patient charts and a lecture on "Pager Management" and some of the top 10 family medicine pages that they will see when covering the pager at night on the wards. I created and taught a skills lab on ingrown toenail removal technique during a skills lab afternoon that my fellow residents and I put on during the course. We also helped to take the students through cases of emergency page scenarios in the simulation lab, where students got to find out what it was like to be placed in these scenarios in a controlled and safe environment. This was a lot of fun and I hope quite educational for the students as well. Last but not least we assisted taking students through several nurse paging scenarios and through paging a specialist scenarios.

I could not have done this without the support of my amazing wife and children. Their support and understanding of all of the long hours and stressful times definitely helped me to do what I needed during residency. The nights reading Harry Potter too my very smart and wonderful daughters Alaina and Ariel, even though often it was past there bed time, was both fun, but also therapeutic for me in helping the stresses and cares slip away while we drifted off into our imaginations. The support of my father was also extremely helpful in helping to care for the kids if they were sick, the baby sitter had off, my wife and I needed a night away, or school was out. I wound not have been able to make it through residency without the support and help of my family.

A Wisconsin native, born in Baraboo, Matt earned his B.S. in Biology from the University of Wisconsin—Oshkosh. He then attended the University of Wisconsin in Madison where he completed his Masters of Physical Therapy. For five years he was employed as a Physical Therapist at Newlife Physical Therapy & Sports Medicine in Portage, until he made the decision to return to academia to complete his medical degree. As a medical student, Matt was accepted into the WARM (Wisconsin Academy for Rural Medicine) Program where he was able to tailor his rotation experiences to align with his interest in rural healthcare. He intends to practice full spectrum family medicine with a special focus in Sports Medicine and Musculoskeletal Injury Care. He is also drawn to a wide variety of procedural experiences in the Family Medicine setting, including upper endoscopy and colonoscopy. In his free time, Matt takes advantage of the outdoors by hunting, fishing, camping and traveling. In addition, he enjoys reading and spending time with his wife and young children.

BPPV Evaluation and Treatment

By: Mathew P. Herbst, MD/PT

Objectives:

1. Discuss the relevance and importance of diagnosing BPPV and consider the Differential
2. Discuss application and methods used for diagnosis and treatment of BPPV
3. Apply this knowledge to sample patient cases, and discuss treatment or referral for treatment

Why do we care about BPPV?

- Lifetime prevalence of BPPV has been shown to be as common as 2.4%
- BPPV is the most common cause of peripheral Vertigo, causing nearly ½ of all cases in this category
- Clinical Symptoms can be debilitating and lead to increased risk of falls
- Diagnosis can be made in the clinic or inpatient setting
- Treatment can be simple and inexpensive

Independent Risk Factors for BPPV

- Age = especially age > 50
- Hypertension
- Hyperlipidemia
- Stroke

von Brevern M, Radtke A, Lezius F, Feldmann M, Ziese T, Lempert T, Neuhauser H; Epidemiology of benign paroxysmal positional vertigo: a population based study: J Neurol Neurosurg Psychiatry. 2007;78(7):710. Epub 2006 Nov 29.

Interesting Facts in Research

- Low Vitamin D Levels in Postmenopausal female patients are associated with increased levels of BPPV.

  Weiwei Han Zhenyi Fan Min Zhou Xu Guo Wang Yan Xiaoxiong Lu Li Li Chengyao Gu Caijing Chen Yunqin Wu; Low 25-hydroxyvitamin D levels in postmenopausal female patients with benign paroxysmal positional vertigo: Acta oto-laryngologica. , 2017, p.1-4

- Osteoporosis is associated with increased risk for BPPV.

  Kai-Chieh Chan Yao-Te Tsai Yao-Hsu Yang Pau-Chung Chen Po-Hung Chang; Osteoporosis is associated with increased risk for benign paroxysmal positional vertigo: a nationwide population-based study: Archives of osteoporosis , 2017, Vol.12(1), p.106

Interesting Facts in Research

- Correlation found between BPPV (&/or) Meniere's Dz and Hashimoto Thyroiditis

  G Chiarella D Russo F Monzani C Petrolo B Fattori E Pasqualetti Cassandro Costante; Endocr Pract Endocrine practice : HASHIMOTO THYROIDITIS AND VESTIBULAR DYSFUNCTION.: official journal of the American College of Endocrinology and the American Association of Clinical Endocrinologists. , 2017, Vol.23(7), p.863-868

- BPPV is a common cause of dizziness in childhood and once diagnosed can be successfully treated w/ Repositioning maneuvers

  Jacob R Brodsky Sophie Lipson Jared Wilber Guangwei Zhou; Benign Paroxysmal Positional Vertigo (BPPV) in Children and Adolescents: Clinical Features and Response to Therapy in 110 Pediatric Patients: Otology & neurotology. , 2017

Peripheral Vs Central Vertigo

	Peripheral	Central
Nystagmus		
Direction	❖ Unidirectional, fast component toward the normal ear; never reverses direction	❖ Sometimes reverses direction when patient looks in the direction of slow component
Type	❖ Horizontal with a torsional component, never purely torsional or vertical	❖ Can be any direction
****Effect of visual fixation****	❖ Suppressed	❖ Not suppressed
****Other neurologic signs****	❖ Absent	❖ Often present
Postural instability	❖ Unidirectional instability, walking preserved	❖ Severe instability, patient often falls when walking
Deafness or tinnitus	❖ May be present	❖ Absent

https://www-uptodate-com.ezproxy.library.wisc.edu/contents/benign-paroxysmal-positional-vertigo?search=BPPV&source=search_result&selectedTitle=1~22&usage_type=default&display_rank=1#H19 Taken 1/5/18 at 1115

Differential Diagnosis for Peripheral Vertigo

- **BPPV (Most Common)**
- Vestibular Neuritis
- Herpes Zoster Oticus
- Meniere Disease
- Labyrinthine Concussion
- Perilymphatic Fistula
- Semicircular Canal Dehiscence Syndrome
- Vestibular Paroxysmia
- Cogan's Syndrome
- Recurrent Vestibulopathy
- Vestibular Schwannoma / Acoustic Neuroma
- Aminoglycoside Toxicity
- Otitis Media
- Cervicogenic dizziness

https://www-uptodate-com.ezproxy.library.wisc.edu/contents/image?imageKey=NEURO%2F66539&topicKey=NEURO%2F5101&search=Vertigo%20and%20red%20flags&rank=3~150&source=see_link Taken 1/9/18 at 1700

Symptoms Consistent with BPPV

- Recurrent episodes of vertigo lasting around 1 minute or less
- Vertigo episodes produced by change in position or head movements
  - Commonly getting in or out of bed, rolling over in bed
  - Sit to / from stand transfers if increased head movement occurs
  - Bending over
  - Looking up into a cupboard / shelf
- Vertigo Description = "The room is spinning"
- Vertigo is commonly associated with nausea, and vomiting can also occur
- Symptoms between vertigo episodes = Imbalance, Nausea, Fear of falling, & Falls

Key History Questions

- How long do the Vertigo (spinning) symptoms last?
  - **Spinning should be < 1 min, nausea/balance issues may persist**
- What does your vertigo / dizziness feel like
  - **Spinning sensation usually present; but if not it does not completely rule out BPPV**
- What movements or positions trigger your vertigo?
  - **Could be any movement causing head changes in relation to gravity**
- Do you get vertigo when staying perfectly still or at rest?
  - **No, If yes then it is not BPPV**
- Do you have any other neurologic symptoms?
  - **No, If yes then we need to rule out other causes**

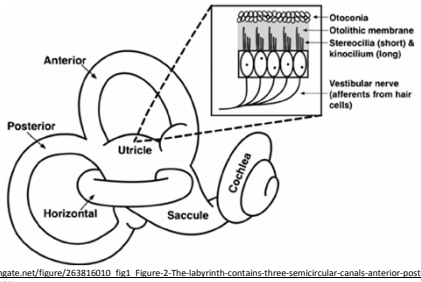
BPPV Symptoms

- The patient does not have BPPV if:
  - They do not describe the symptoms of brief severe spinning vertigo during head movements in relation to gravity
  - The symptoms cannot be reproduced by the Dix-Hallpike Test or the Roll Test

Pathophysiology: What is BPPV / Canalithiasis?

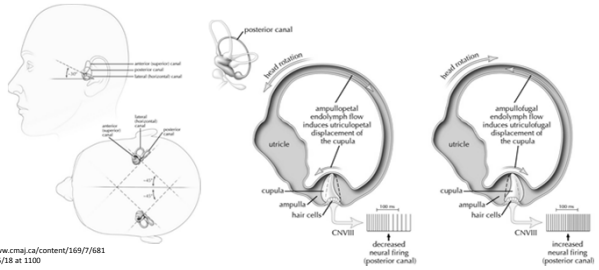
- "Loose rocks in your ears" = Loose otoconia / crystals from the urticarial sac, moving in the semicircular canals of the inner ear
- These otoconia are a portion of the sensory receptors in the inner ear that measures angular head accelerations
- The otoconia then cause inappropriate movement of the endolymph w/in the canals. This keeps the momentum of the endolymph going and continue to stimulate the sensory receptors which tell your brain that you are still moving even though you have stopped.

Structure of the Inner Ear



https://www.researchgate.net/figure/263816010_fig1_Figure-2-The-labyrinth-contains-three-semicircular-canals-anterior-posterior
Taken on 1/5/18 at 1100

Structure and Function of the Inner Ear



http://www.cmaj.ca/content/169/7/681
Taken 1/5/18 at 1100

Testing of the Anterior & Posterior Canals
(Most Common 85-90%)

- Dix-Hallpike Test (Sensitivity 79% & Specificity 75%)
  - Considered the Gold Standard
- Sidelying test for BPPV (Sensitivity 90% & Specificity 75%)

Rashmi B Halker David M Barrs Kay E Wellik Dean M Wingerchuk Bart M Demaerschalk; Establishing a diagnosis of benign paroxysmal positional vertigo through the dix-hallpike and side-lying maneuvers: a critically appraised topic: The neurologist , 2008, Vol.14(3), p.201-204

  - Right sided testing = Right Posterior & Left Anterior Canal
  - Left sided testing= Left Posterior & Right Anterior Canal

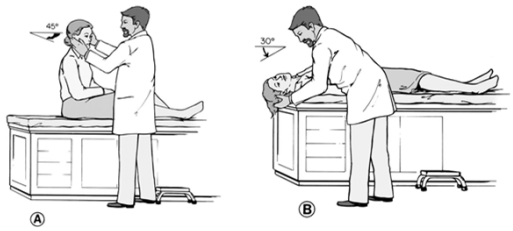
Testing of the Horizontal Canals
(Rare 10-15%)

- Roll Test for Horizontal Canal Testing
  - Head rotated right = Right horizontal Canal
  - Head rotated left = left horizontal Canal

Considerations Prior to Testing

- Active and passive cervical range of motion
- Is there a risk of Vertebral Artery compromise?
- Can this patient tolerate the repositioning?
- Is there a risk of vomiting?
- Can I do this safely at this time?
- Do I have time to complete this or should I refer?

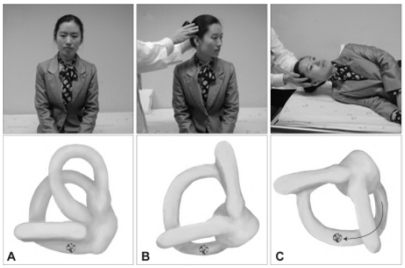
Dix-Hallpike Testing



Testing Right Posterior Canal and left Anterior Canal for Canalithiasis.

http://www.cmaj.ca/content/169/7/681
Taken 1/5/18 at 1100

Sidelying Test = Alternative to Dix-Hallpike



This can be completed if the patient is unable to tolerate the Dix-Hallpike test modification using a pillow.

It can be beneficial if patients can not tolerate supine position due to back or neck pain.

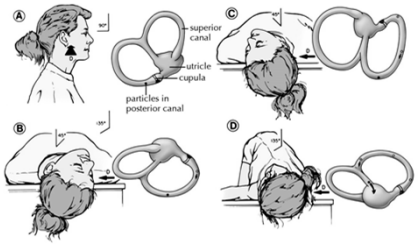
It can also be beneficial if the bed / office table does not allow the head to be off the end into 30 degrees of extension

https://openi.nlm.nih.gov/detailedresult.php?img=PMC2895225_jcn-6-51-g004&req=4
Taken 1/5/18 at 1130

Epley Maneuver = Treatment of Anterior / Posterior Canal Canalithiasis

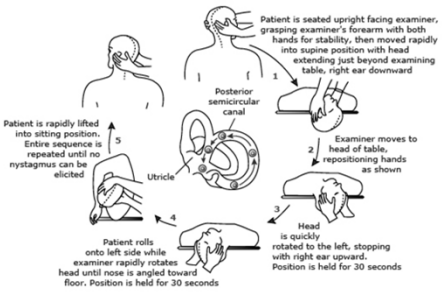
- Start with Dix-Hallpike on the side that was (+), then take them through the specific head position and motions.
  - Sitting with head turned 45 Deg to affected side, and extended 30 Deg, then quickly bring the patient back to a supine position with the head / neck in the same orientation.
    - Off the end of the table (or) with a pillow behind there thoracic spine.
  - Then rotate the head in the opposite direction 90 deg, to the be facing 45 deg to the contralateral side.
  - Next the patient roles onto their side to which the head is facing, but with the head maintained in the position it was. (Looking down to that side and extended 30 deg)
  - Chin Tuck and bring the patient ups sideways to a sitting position.
- Sustain each position for at least 30 seconds after the nystagmus / subjective room spinning has topped.

Epley Maneuver = Office based treatment



http://www.cmaj.ca/content/169/7/681
Taken 1/5/18 at 1100

Epley Maneuver = Office Based Treatment



https://www-uptodate-com.ezproxy.library.wisc.edu/contents/benign-paroxysmal-positional-vertigo?search=BPPV&source=search_result&selectedTitle=1~22&usage_type=default&display_rank=1#H19
Taken 1/5/18 at 1115

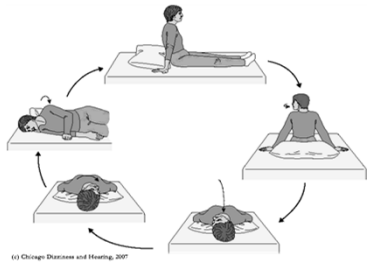
Care After Treatment

- Following Repositioning Procedure of choice some experts recommend restricting head movement and body movement for 24-72 hours.
  - This is thought to give the Otoconia time to settle in the Utricle & Saccule following treatment.
- May benefit from having someone else that can drive after treatment
- Consider referral to Physical Therapy if continued symptoms of vertigo, or if residual balance deficits are noted

Prognosis

- 67-95% recovery from a single treatment was noted in a meta-analysis
  - Helminski JO, Zee DS, Janssen I, Hain TC. Effectiveness of particle repositioning maneuvers in the treatment of benign paroxysmal positional vertigo: a systematic review. Phys Ther 2010;90:663-678
- 88.9% recovery noted with repeated maneuvers in a single visit or on repeated visits.
  - S. Lynn, A. Pool, D. Rose, R. Brew, V. Suman; **Randomized trial of the canalith repositioning procedure ;**Otolaryngol Head Neck Surg, 113 (1995), pp. 712-720
- 15% Recurrence rate has been noted within 1 year
  - von Brevern M, Radtke A, Lezius F, et al. Epidemiology of benign paroxysmal positional vertigo: a population based study. J Neurol Neurosurg Psychiatry 2007;78:710-715

Self Epley Maneuver / Modified Epley's w/ Pillow



Example of a Self Epley maneuver for left Posterior canal canalithiasis

Also shows modification of Epley Maneuver using a pillow

https://www.pinterest.com/pin/434738170250014425/
Taken on 1/5/18 at 1730

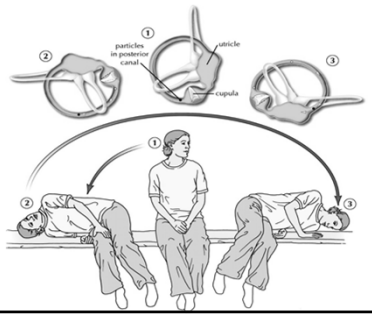
Liberation Maneuver of Semont = Self Treatment

Self-treatment maneuver that can be tried at home by the patient.

This is a specific treatment for the Right Posterior & Left Anterior Canals

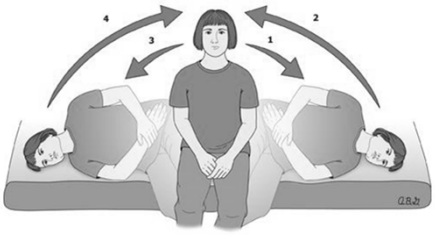
This would be appropriate for a (+) Right sided Dix-Hallpike, the treatment would be reversed for a (+) left sided Dix-Hallpike test.

Pay particular attention to head position.



http://www.cmaj.ca/content/169/7/681
Taken 1/5/18 at 1100

Brandt-Daroff Maneuver = Desensitization



Desensitization of the vertigo rather than Treatment.

Continue 10-20 times, up to 3x/day for 3 weeks.

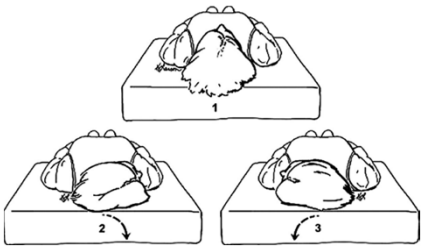
Can consider shorter movements at first using pillows or blankets.

https://www-uptodate-com.ezproxy.library.wisc.edu/contents/benign-paroxysmal-positional-vertigo?search=BPPV&source=search_result&selectedTitle=1~226&usage_type=default&display_rank=1#H19
Taken 1/5/18 at 1115

Roll Test for Horizontal Canals

- Supine position with or without a pillow
- Check Active & Passive range of motion of the neck
- Quickly rotate the head in a shortened pain free range of motion in one direction, wait for 30-60 seconds and see if nystagmus and vertigo occurs
- Follow this up by rotating the head in a shortened pain free range of motion in the opposite direction, wait for 30-60 seconds and see if nystagmus and vertigo occurs
- Alternate testing = Start with head rotated to one side, and then quickly rotate the head back to a midline position. Repeat this in the opposite direction.

Roll Test for Horizontal Canal

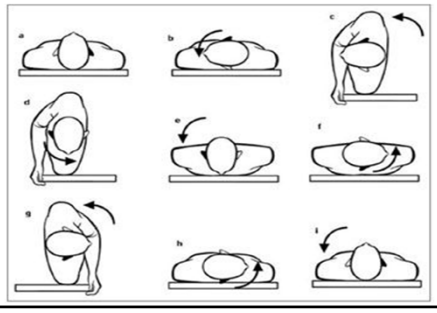


https://www.researchgate.net/figure/Diagrammatic-views-of-the-supine-roll-test-1-The-patient-is-in-the-starting-neutral_283739258
Taken 1/5/18 at 1130

Horizontal Canal Repositioning Technique / CRT

- This is a difficult technique for many patients to complete on a normal exam table. It can be completed much more easily on a physical therapy mat table.
  - You may want to refer this on to physical therapy
- There are more steps in this process and again head position and time in each position is critical
- Sustain each position for at least 30 seconds after the nystagmus / vertigo has topped.
- Start by rotating the head in the direction that causes nystagmus / Vertigo

Horizontal Canal Repositioning Technique / CRT



https://www.pinterest.com/pin/836051118296969517/
Taken 1/5/18 1145

Divneet Kaur, MD

Divneet Kaur hails from Eugene, Oregon. She studied Religion at Whitman College, the appropriate prequel to medical school at Oregon Health & Sciences University School of Medicine. Prior to medical school, Divneet worked as an AmeriCorps VISTA volunteer in two public health departments in Oregon, which helped instill her appreciation for population and community health. She continued to enjoy public health policy and advocacy projects throughout medical school, leading programs to administer free flu and TDAP vaccines to parents and caregivers of patients at the children's hospital, as well as helping to organize OHSU's Reach Out and Read program. Outside of medicine, Divneet enjoys playing outside in any capacity, eating dark chocolate, reading in parks, hiking (up hill), soccer, tennis, and pretending her life is a musical.

Projects Completed During Residency:

Community Health Learning Experience:

Tobacco Quit Groups: Implementing Tobacco Cessation Programs for Public Housing Residents Transitioning to Smoke-Free Housing

Scholarly Project:

Family Physicians Inquiries Network (FPIN): Does Marijuana Use in the Teen Years Predict Development of a Future Substance Use Disorder in Adulthood?:

Based on an overview of current evidence, the use of marijuana in teenage years may predict substance use disorder in later years, though more research is needed on this topic. A systematic review published in Lancet in 2004 examined 48 prior longitudinal studies and determined fairly consistent associations between marijuana use and increased reported use of other illicit drugs. An integrative analysis published in 2014 in Lancet Psychiatry showed those who were daily users before age 17 years had substantially increased odds of later marijuana dependence and use of other illicit drugs. Two longitudinal studies from 2015 and 2018 corroborated these findings but acknowledged significant loss to follow up.

It has been a glorious 3 years and I feel quite lucky to be a part of such a wonderful community. Thanks team!

Tobacco Quit Groups: Implementing Tobacco Cessation Programs for Public Housing Residents Transitioning to Smoke-Free Housing

Background: The U.S. Department of Housing and Urban Development (HUD) proposed a policy that would require all public housing agencies (PHAs) to implement a smoke-free policy. In lieu of this proposal and the known public health benefits of smoke-free housing, Madison's Community Development Authority (CDA) passed a smoke-free policy for all of public housing properties to take effect January 2018. The Department of Public Health Madison and Dane County (PHMDC) partnered with the University of Wisconsin Department of Family Medicine and Community Health to create and implement a smoking cessation program to aid residents of these public housing units in preparing for this transition.

Objectives: The goals of this project were to provide resources and group counseling to public housing residents to help transition to smoke-free living. The combination of appropriate medications and motivational interviewing is shown to be the most effective way to provide smoking cessation care.

Methods: Two of the three major low-income housing units are on Park St and we noted a number of residents sought care within the Access system. Using internal data, we compiled a list of HUD housing residents with any smoking history, and contacted them individually by phone, with letters, and with posted fliers. Given difficulty with transportation, along with our realization of the significant psychiatric comorbidities of this population, we decided to do our subsequent Quit Group sessions at the housing units themselves instead of at Wingra. These Quit Groups were part of a broader preparatory curriculum led by the PHMDC and CDA. Other events included multiple "town halls" to discuss the policy, tobacco-free health fairs with Quit Line representatives, as well as Quit-Smoking BINGO nights.

Results: We had 4 group visits at Wingra with 1-4 people in attendance and everyone successfully able to follow the new, smoke-free policy. One person was able to quit smoking entirely and one was able to significantly cut back. With the support of the onsite social worker, Laura and Nina from the PHMDC, we provided three drop-in sessions for individualized motivational interviewing at the housing units as well.

Next steps: Recruitment and consistent attendance proved to be our biggest issue, but our presence on-site continued to be part of the larger educational curriculum presented to housing residents. As compliance with the policy has so far been difficult to track, both the CDA and PHMDC are moving forward to survey the property and the residents to determine how the transition to smoke-free housing is fairing. The results of this will help dictate further need, and the success of the educational curriculum. We have also since partnered with Dr. Joe Eichenseher at Access Community Health Center, where continued group visits are occurring weekly and will have UW resident involvement. These are being heavily promoted at the housing units and are open to all CDA residents as well as Access patients.

Acknowledgments: Thanks to Robin Lankton who originally connected us with the PHMDC, and Kirsten Rindfleisch who provided all insight on logistics. Nina Gregerson, the lead of Tobacco Free Dane County Coalition and our link at the PHMDC, and Laura Wickert, the CDA Service Coordinator. Also, the Wingra health coaches, Joe Eichenseher, Mukund and Katie… who all rule.

Yoshito Kosai, MD

Projects Completed During Residency:

Community Health Learning Experience:

2020 Fitness and Lifestyle Challenge at UW Health Verona Clinic

Scholary Project:

Constant Comparative Analysis of the 2020 Fitness and Lifestyle Challenge at UW Health Verona Clinic:

I was involved with qualitative analysis of data obtained from MPH candidate, Sarah Litman, about the program. She interviewed 6 participants about various aspects of the program. We performed a constant comparative analysis to arrive at substantial themes for the 2020 Fitness and Lifestyle Challenge at UW Health Verona Clinic. At the time of submission of this abstract, we are still in the process of writing up our findings. I was on the committee for Sarah Litman's MPH capstone defense held on May 4, 2018.

I would like to thank my wife, Ellen Krahn, for her continued support throughout residency. She was there through many difficult times. I would also like to thank my parents (Machiko and Makoto Kosai) for their continued support during my medical training. I am also happy to have made my grandparents wish of becoming a physician come true. A special thanks to my new in-laws, the Krahn family (Dean, Dawn, David and Katie McManus) for their love and support.

Yoshi Kosai grew up in Lynnwood, Washington, and earned his bachelor's degree in Computer Engineering from the University of Washington in Seattle. He then went on to complete his medical degree at Case Western Reserve University School of Medicine in Cleveland. He comes to Family Medicine with a strong interest in sports medicine, and athletics have been an important part of his life, both as a lifelong ice hockey player and as a coach in several capacities (including head coach for the Western Washington Female Hockey Association). The physician mentors he encountered working on the sidelines of high school and collegiate sports events inspired him to pursue a career in primary care sports medicine. However, through experiences throughout residency he became drawn to focus on incorporating fitness, exercise, and sports with mental health to create an "integrative" approach to healthcare. He will be bringing his diverse interests to the field of Integrative Medicine through the UW Academic Integrative Health Fellowship. He is also drawn to Family Medicine for its focus on prevention and care coordination, as well as its diversity of patients and attention to the socioeconomic needs of patients. As a medical student, he served as senior clinician at the student run free clinic. In his free time, Yoshi's other interests include ice hockey, computer science, traveling, dogs, and triathlons.

2020 Fitness & Lifestyle CHALLENGE

UW Health Verona Clinic

Background:

More than one-third of US adults (36.5%) are obese and obesity has dramatic physical, psychosocial, and functional consequences. The CDC reports that obesity and obesity-related conditions (hypertension, type 2 diabetes, heart disease, stroke, and certain types of cancer) are some of the leading causes of preventable death. The national Healthy People 2020 Initiative set goals of decreasing the prevalence of adults who are obese. In response to these efforts, the UW Health Verona Clinic founded the "2020 Fitness and Lifestyle Challenge" in 2014. This was a way of both meeting the national need of fighting obesity and addressing the needs of our clinic. Verona clinic patients with pre-diabetes and a body mass index (BMI) of 30 or greater who have GHC, Physician's Plus, or Quartz (Unity) Insurance were recruited for the program that included shared medical appointments with an interdisciplinary team.

Objectives:

The program's goal is to help promote healthy lifestyles through nutrition and physical exercise in a group setting. Ultimately, the goal was to show the effects of group medical visits on obesity-related disease prevention. My direct role within the program was to help with small group sessions and support participants. To meet the requests of increased frequency of visits, I was also involved in organizing informal meetings in addition to monthly visits. These informal meetings discussed additional educational topics (exercise, diet and food choices, habit formation). This was implemented for the 2018 program but was not offered in the years past. For my scholarly project, I was also involved in the analysis of qualitative data obtained.

Methods:

Participants were recruited to participate in the "2020 Fitness and Lifestyle Challenge" by their primary care providers. Participants were required to have healthcare insurance from one of our partners (GHC, Physician's Plus, or Quartz/Unity). There was a $100 wellness incentive to help offset group visit copays. They were required by their insurance to attend at least 5 out of the 6 group visits, prepare at least 2 healthy meals per week, and exercise 2 times per week at a fitness facility of their choice or walk at least 5,000 steps daily. Pedometers were provided to all participants; however, other fitness trackers were allowed for step counting.

Group visits were held once per month, with each visit lasting approximately 90 minutes. The curriculum involved 15 minutes of checking in/obtaining vital signs, 15-25 minutes of guided stretching/relaxation exercises, 30 minutes of eating a healthy meal/topic discussion and 20 minutes of small group personal goal setting.

Nutritional support was provided, which included:

1) Meal planning with weekly emails that contained healthy recipes, nutrition information, and grocery lists.
2) Assistance from our grocery partners:
    a. Hy-Vee Fitchburg offered 10% off discounts on groceries, nutrition consults and grocery shopping with Kara Hoerr, the Hy-Vee nutritionist.
    b. Miller's Supermarket offered gift cards (no longer offered).
3) Nutrition Tracking: With the use MyFitnessPal. Participants were able to receive weekly feedback from our nutritionist for extra support and accountability.
4) List of healthier menu items at local fast food restaurants.

Fitness Support was provided, which included:

1) Personalized fitness assessment at YMCA of Dane County with free 2-week trial membership for non-members were available for participants.
2) Individualized fitness coaching for 3 weeks at Anytime Fitness.
3) Participants are expected to exercise 2 times per week over the 20-week challenge or walk 35,000 steps per week (5,000 steps per day).

Discussion topics included: mindful eating, reading nutrition labels, using Therabands, and having conversations about barriers/roadblocks to arriving at a healthier weight.

To monitor the effects of the program on the participants, we obtained pre- and post-intervention data for each cohort including: PHQ-9, SF-36, weight, as well as a tool designed specifically for this study entitled "fitness and lifestyle challenge self-assessment".

Results:

Although data for 2016-2018 are yet to be analyzed, data analysis has been performed for 2014-2015. This data analysis included 25 participants who met inclusion criteria by completing all visits, baseline and follow-up questionnaires. The results demonstrated significant reduction in pain (58.54 to 76.88 points, $p=0.004$), increase in emotional well-being (64 to 77.67 points, $p=0.016$), decrease in PHQ-9 scores (6 to 3.6 points, $p=0.019$), and weight loss (252.2 to 247.2 lbs, $p=0.03$). There was also change in the composite SF-36 (50.8 to 62.5 points, $p=0.06$). The fitness & lifestyle challenge self-assessment survey reported improvement in each of four self-care areas, which include: 1) meal planning, 2) regular exercise (20 minutes, twice weekly), 3) knowledge of pedometer use, and 4) recognition of inexpensive methods of exercise and healthy eating ($p<0.05$).

Conclusions:

This project has helped demonstrate that there may be significant impact on the prevention of obesity-related disease with community-supported interdisciplinary clinic-based group visits for obese patients. In addition, there may be significant impact on improved mental health.

Qualitative data suggests that there may be significant benefit from small group discussions to help participants feel supported and to develop novel approaches to lifestyle change. An approach with a focus on lifestyle change (as with this program) was reported by participants as more beneficial than traditional weight loss programs.

Our goal is to provide evidence of this particular type of approach and to inspire other clinicians to implement similar programs throughout the nation.

As with any intervention there were challenges that were present. Some participants had problems with some of the community-based resources that were provided. Another challenge that was present during follow up was that the lifestyle changes that were developed during the program did not seem persist following the end of the program.

Overall, this project demonstrated the power behind a community-based approach to shared medical visits on prevention of obesity-related disease. Further research in this approach is needed to find the optimal utilization of such an approach to promote health.

Acknowledgments:

Many thanks to our community partners including Anytime Fitness, Hy-Vee, Miller's, GHC insurance, PPIC insurance, Unity health insurance, Jo Temte for teaching the guided stretching/relaxation exercises, and Kara Hoerr, RD. Thanks to Sarah Litman for acquiring interview data on this project. I want to especially thank my mentors and the leaders of these group visits - Brian Arndt, Karina Atwell, Maggie Larson, Julia Yates, and Tom Hahn.

Lucas Kuehn, MD

Projects Completed During Residency:

Community Health Learning Experience:

First Breath & My Baby and Me: Continuation of Evidence-Based Prenatal Tobacco Intervention.

Scholarly Project:

Is a Gluten-Free Diet Effective in Improvement of ADHD in Pediatric Patients?:

A literature search and review was performed to determine if maintaining a gluten-free diet improved ADHD symptoms in pediatric patients. Without the presence of celiac disease research showed minimal or no improvement in ADHD symptoms, and where improvements were present, it was related to hyperactivity symptoms only. A number of children who displayed ADHD-like symptoms actually had celiac disease with neurological manifestations of the disease. Symptoms improved because those children did not have ADHD. Bottom line is that there is a paucity of data and more research needed to accurately answer the question above.

A big thank you to my wife Victoria for being there by my side through medical school and residency. Also thank you to the rest of my family, friends, and co-residents for always being supportive!

A fourth generation Wisconsinite, Lucas grew up in Waunakee, Wisconsin. He completed undergraduate degrees in Biology and Psychology at the University of Wisconsin in Whitewater and earned his medical degree from the University of Wisconsin School of Medicine and Public Health. Luke's passion for building relationships and his diverse interests in behavioral health, sports medicine, and obstetrics are a natural fit for family medicine. As a medical student he was a participant in the Wisconsin Academy for Rural Medicine (WARM) program, which provides students with a longitudinal rural curriculum at sites throughout the state. Experiences in the WARM program had a powerful impact on Luke, showing him the true meaning of continuity of care and trust between the physician and patient, and served to strengthen his commitment to family medicine. Rotations in the rural Wisconsin communities of Howard's Grove and Belleville amplified his interest in rural practice. Luke is an avid Badger football and basketball fan, and enjoys playing basketball, pursuing outdoor activities, reading fiction, and spending time with his wife Victoria, son Aiden, and his dog Gus. He and the rest of his family are excited for the addition of a baby girl, who is due in late May. Luke will be practicing a combination of outpatient family mediicne in Waunakee and hospital medicine at St. Mary;s.

First Breath & My Baby and Me:

Continuation of Evidenced-Based Prenatal Tobacco Intervention.

Background:

This is the second year that this community health project has been done at Belleville. Our clinic has partnered with the Wisconsin Women's Health Foundation who sponsors First Breath and My Baby and Me. It had previously been identified that pregnant women utilizing prenatal care at Belleville had higher rates of tobacco use during pregnancy (13%) than most other UW Health clinics (4-20%). Interestingly, data also show that Wisconsin as a whole has higher rates of tobacco use during pregnancy (11.3%) when compared to the rest of the nation, about 7% according to February 2018 data.

Objectives:

This objective of this project is to use evidence-based programs to reduce the number of pregnant women using tobacco and/or their level of exposure to tobacco via either quitting or reducing tobacco use. Intention is to improve health of both moms and newborns and to decrease neonatal morbidity in our clinic population. In addition we also hope to screen and refer women to the My Baby and Me program to help women struggling with alcohol use during pregnancy to achieve an alcohol free pregnancy.

Methods:

Wisconsin Women's Health Foundation offers both the First Breath and My Baby and Me programs to reduce tobacco use/exposure and alcohol use during pregnancy. Both programs integrate clinic-based motivational interviewing with patient gift incentives. Patients are screened for tobacco use/exposure and alcohol use during their initial prenatal visit. If they screen positive, we offer referral to first breath via form filled out in clinic or online. Data from First Breath suggest that about 80% of participants are able to quit or cut down on tobacco use during pregnancy. Compared to the first year this program was available at our clinic, referrals not only included mothers who use tobacco during pregnancy, but significant others and family members who may use tobacco in the mother's presence. All residents at Belleville will become First Breath and My Baby and Me providers through an online training.

Results:

No major data has yet been gathered and results from the First Breath and My Baby and Me Programs will likely be available within the next 6 months to 1 year. We have had 1 referral to First Breath and zero to My Baby and Me.

Conclusions:

During the continuation of this project, I learned the difficulties of connecting with community partnerships that have not been well-established. Our contact in the from the Wisconsin Women's Health Foundation changed to a different individual this year compared to last and we were unable

to arrange for a presentation to introduce First Breath to the new residents until the Spring of 2018. Also, there was concern about whether funding for My Baby and Me would be continued, so implantation of this program was on hold until very recently. Fortunately, the program has received funding to continue for the next several years. This program will be continued at Belleville by future residents, with plans to attempt to implement training early in the year and maximize our ability to reduce tobacco and alcohol use during pregnancy.

Acknowledgements:

Thank you to Wisconsin Women's Health Foundation, specifically Lauren Lotter, who is our community partner for First Breath and My Baby and Me!

S. Dylan Ledford, DO

Projects Completed During Residency:

Scholarly Project:

OMT Case Presentation: Fascia and Function

Community Health Learning Experience:

Dryden Terrace Community Engagement:

Dryden Terrace is an ongoing community engagement program whose aim is to decrease emergency resource utilization, provide education and build rapport with the residents of Dryden Terrace, an apartment building located across the street from Northeast Clinic. My role in this project was to coordinate educational experiences focusing on health education, physical fitness and mindfulness during the program's monthly Dining with Doctors events. I led and cooperated on events including guided chair yoga exercise, mindfulness body scan, deep breathing techniques, and health literacy focused afternoons utilizing medical trivia and resident-led open health forums.

Thank you to my wife, Dr. Kate Ledford, for keeping me going when I wanted to stop, stopping me when I wouldn't and loving me unconditionally. I wouldn't be half the person I am today without your unconditional love and wisdom. Thank you to my mother and father-in-law for being such an incredible and stable force of love and support. And thank you to my son, Lincoln, who always reminds me to be present and for making me a more compassionate and caring person.

Steven (Dylan) Ledford grew up in Hillsboro, Oregon. Dylan spent his formative years working as a commercial fisherman and on farms near his home before heading to Oregon State University to earn his bachelor's degree in Microbiology. He then continued on to the Western University of Health Sciences College of Osteopathic Medicine for his medical degree. Dylan was an active advocate for the health of his community during medical school, serving as a board member for Build Lebanon Trails where he helped raise funds and plan the construction of community trails and parks. He also spent time mentoring at-risk students at the local high school and volunteering at the local free clinic. With his partner Kate, he help found the "Do No Harm Forum," for which he spent much of his time coordinating the monthly discussions, including inviting educators and leaders from the community and surrounding universities to discuss new and innovative models of care with the medical school community. Dylan's interests within family medicine include OB, urgent care, sports medicine, and integrative medicine. In his free time, he enjoys keeping active and playing video games.

Fascia and Function

S. Dylan Ledford, DO
5/4/18
St. Clare Hospital
Baraboo, WI

"If barriers existed, they were in minds and methods, not in the biological system." Korr 1977

Case

- SD is a 36 year old with low back pain.
  - Duration: 1 week, occurred while removing scrap metal from pickup
  - Location: back and BIL hips
  - Trauma Hx: similar incident years ago, no chronic low back pain

Exam

- VS: BP 138/82 HR 66 Weight 284 Pain score 4/10
  - Gen: Obese in NAD
  - CV/Resp: RRR, CTAB
  - Neuro: normal gait, gross sensation intact, muscle strength 5/5 BIL LE
  - MSK: straight leg neg, FABERS negative but laying on his back exacerbates his pain.

Acute LBP: A case for OMT

- Multiple studies show that OMT is effective for pain relief and improved function in acute low back pain. (6, 7,8)

Osteopathic Evaluation

- Assess fascial planes for TART changes:
  - Tissue texture
  - Asymmetry
  - Restriction
  - Tenderness

Fascial motion

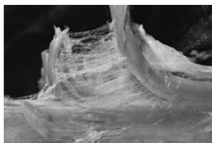
- Assess fascial planes for TART changes:
  - Tissue texture
  - Asymmetry
  - Restriction
  - Tenderness

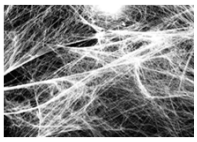
- Thoracic Spine SD:
  - Restricted rotation and side-bending L
- Rib SD:
  - Posterior left ribs 5/6/7

- Lumbar Spine SD:
  - Fascial restriction L rotation and side-bending
- Pelvis SD:
  - Decreased abduction L, restriction to external rotation of R hip

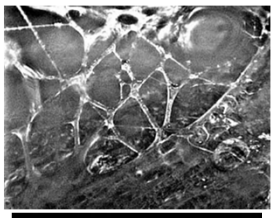
What is Fascia?

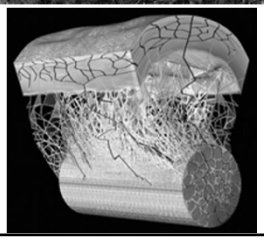
- Layers of fibrous tissue surrounding groups of muscle, bone, blood vessels
- Binds structures while allowing movement and gliding
- Connective tissue containing collagen fibers





- Distributes force while maintaining shape
- Contains sensory receptors mechano-, chemo-, noci- and thermo-receptors
- Has ability to contract similar to smooth muscle – not voluntarily but in response to stimuli





"Fascial restriction is an impediment to optimal gliding at both macro and microscopic organization levels between endo-fascial fibers and inter-fascial planes. Such restriction can cause anomalous tension and movement disorders." (Fourie)

Addressing Function

- Functional Technique:
  - A group of techniques that prioritize functional over the structural component of the structure-function relationship
  - Encompasses FPR, Still and Long-lever
  - Establishing ease response within a restricted segment.
  - Treating a region rather than "lesion" via structural integration
  - Less focused on diagnosing segmental SD

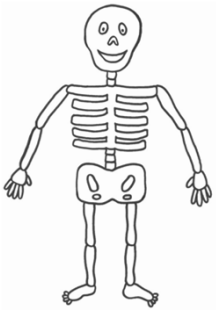
The Technique

- Assessment and monitoring of fascial planes
- Direct technique
- Uses articulatory and HVLA techniques to the region

Treatment approach loosely based on Drop and Flop Method

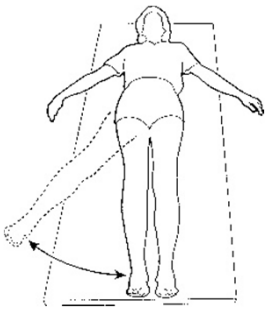
- Start at the hips, assess primary restriction in motion
  - Treat hip joint adhesions
  - Release myofascial structures of SI and primary hip
- Lumbar Spine
  - HVLA of lumbar region focusing on fascial plane

- Thoracolumbar junction
  - HVLA of TLJ focusing on fascial plane
- Ribs: HVLA
- Cervical Spine: HVLA
- Clean up remaining SD



ADductor

- Patient supine
- Stabilize ipsilateral hip and ankle
- Abduct ipsilateral hip to physiologic barrier
- Perform lateral LVHA (articulatory) while taking up slack with each articulation
- At end range of motion perform HVLA thrust with abduction of the ipsilateral hip. TO THE FASCIA



Lumbar

- Patient lies on contralateral side of restriction
- Monitor region of restriction while flexing ipsilateral hip until target region isolated and extend tableside hip
- Pull table side arm towards operator and rotate torso away
- Apply downward, rotational force using articulatory while taking up slack with each articulation
- At end range of motion perform downward HVLA thrust TO THE FASCIA

Billing

- Diagnosis: make sure to have the allopathic diagnosis as well!
  - Dx: Low back pain
  - Somatic dysfunction of ribs - M99.08
  - Somatic dysfunction of lumbar region - M99.03
  - Somatic dysfunction of pelvic region - M99.05
  - Somatic dysfunction of lower extremities - M99.06
- Procedure Fees:
  - Osteopathic Manipulation, 3-4 regions
- LOS:
  - 99214, level 4 Modifier 25, GC

Case follow up

- SD reported immediate improvement of symptoms, less pain, better range of motion.
- Patient has returned to work!

Moving Forward

- Lumbodorsal fascia (LF) as a possible source of idiopathic LBP due to nociceptive free nerve endings in the LF (Wilke)
- Fasica as the “end point” in manipulative treatment
- FDM : trigger bands trigger points, continuum distortions and folding distortions

Moving Forward

- “…the beneficial endpoint of therapies, improvement in health, no real distinction exists between these two classes classes of therapies. They may be viewed as points on a continuous spectrum of therapeutic benefit, due in a major part to the stimulating effects of these therapies upon fascia.” (9)

References

1. Richard Schuster, Functional Technique Musckuloskeletalkey.com
2. Fourie, WJ 2008 Considering wider myofascial involvement as a possible contributor to upper extremity dysfunction following treatment for primary breast cancer. J.bodyw. Mov. Ther. 12 (4) 349-355.
3. Wilke, Jan. The Lumbodorsal Fascia as a potential source of low back pain: A narrative review. Biomed Res Int. May 2017.
4. Schleip R., Vleeming A., Lehmann-Horn F., Klingler W. Letter to the editor concerning ‘A hypothesis of chronic back pain: ligament subfailure injuries lead to muscle control dysfunction’ (M. Panjabi) *European Spine Journal*. 2007;16(10):1733–1735
5. The Journal of the American Osteopathic Association, May 2018, Vol. 118, 341-344. doi:10.7556/jaoa.2018.044
6. The Journal of the American Osteopathic Association, August 2016, Vol. 116, 536-549
7. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials John C Licciardone, Angela K Brimhall and Linda N King *BMC Musculoskeletal Disorders*20056:43
8. Osteopathic manipulative treatment for nonspecific low back pain: a systematic review and meta-analysis Helge Franke, Jan-David Franke, Gary Fryer BMC Musculoskelet Disord. 2014; 15: 286
9. DROP & FLOP DAMON WHITFIELD, D.O.

Michele Malloy, MD

A Wisconsin native, Michele grew up in Middleton, Wisconsin and earned her bachelor's degree at the University of Wisconsin – Madison. She went on to complete her medical school training at the University of Wisconsin School of Medicine and Public Health, participating in the Training in Urban Medicine and Public Health (TRIUMPH) program in Milwaukee, WI. Continuity of care with mothers and babies is a special interest of Michele's that drew her to family medicine. Before medical school, she worked with certified nurse midwives at Sixteenth Street Community Health Center in Milwaukee as an Americorps member where she helped support the Centering Pregnancy program and optimized patient education materials in the women's health department. While in medical school, Michele co-led the MOMS (Medical students Offering Maternal Support) program, which partners students with expectant moms to serve as support during pregnancy, labor, and birth and demonstrated the importance of supporting mothers who have limited community support. In her free time, Michele enjoys being outside with her husband (Matt) and children (Eleanor, Claire, and Owen), running, backpacking / hiking, and biking.

Projects Completed During Residency:

Scholary Project:

Persistent Pain with Breastfeeding (ABM Clinical Protocol #26)

Community Health Learning Experience:

Breastfeeding Support in Communities of Color: A Primer in the Community Health Improvement Process:

Culturally-sensitive breastfeeding support is a vital component of high-quality mother-baby care and lack thereof has been implicated in the current racial disparity seen in infant mortality. Before action can be taken to address this issue, particularly in such racially divisive times, a robust understanding of community priorities, assets, and stakeholders is necessary. Through individual meetings with community leaders and conversations with patients, several goals have emerged: improve the delivery of breastfeeding advice to women of color in health care settings, increase peer support for new mothers, and empower and enable women of color to become financially stable while serving in breastfeeding support roles.

Thank you to:
~Dr. Anne Eglash - for serving as my breastfeeding mentor since medical school, always working on several projects at once and continually encouraging me to get involved.
~AABA - Hershey Barnett-Bridges, Tia Murray, and Tamara Moore - for allowing me to spend time with them to learn about their lives, goals, assets, and challenges.
~Dr. Jennifer Edgoose - for encouraging me to look beyond deliverable outcomes to better understand and serve my community.

BREASTFEEDING MEDICINE
Volume 11, Number 2, 2016

DOI: 10.1089/bfm.2016.29002.pjb

ABM Clinical Protocol #26: Persistent Pain with Breastfeeding

Pamela Berens,[1] Anne Eglash,[2] Michele Malloy,[2] Alison M. Steube,[3,4]
and the Academy of Breastfeeding Medicine

A central goal of The Academy of Breastfeeding Medicine is the development of clinical protocols for managing common medical problems that may impact breastfeeding success. These protocols serve only as guidelines for the care of breastfeeding mothers and infants and do not delineate an exclusive course of treatment or serve as standards of medical care. Variations in treatment may be appropriate according to the needs of an individual patient.

Purpose

TO PROVIDE EVIDENCE-BASED GUIDANCE in the diagnosis, evaluation, and management of breastfeeding women with persistent nipple and breast pain.

Definitions

Among breastfeeding women, it can be challenging to distinguish pathologic pain from discomfort commonly reported in the first few weeks of breastfeeding. In this protocol, we define persistent pain as breastfeeding-associated pain lasting longer than 2 weeks. We are not addressing acute or recurrent mastitis as it is covered in ABM Protocol #4 Mastitis, Revised March 2014.[1]

Background

Pain and discomfort associated with breastfeeding are common in the first few weeks postpartum.[2] (II-2) (Quality of evidence [levels of evidence I, II-1, II-2, II-3, and III] is based on the U.S. Preventive Services Task Force Appendix A Task Force Ratings[3] and is noted in parentheses.) Since this is a common cause for early breastfeeding cessation,[4] the mother–baby dyad should be evaluated by a lactation specialist. Beyond this early period, reports of pain generally decline, but as many as one in five women report persistent pain at 2 months postpartum.[5] While initial discomfort with early latch may be considered physiological, pain severe enough to cause premature weaning should not. In one study of 1323 mothers who stopped breastfeeding during the first month postpartum, 29.3% cited pain and 36.8% identified sore, cracked, or bleeding nipples as an important reason.[6] Several authors have found a relationship between breastfeeding-associated pain and postpartum depression.[7,8] (II-2, III)

These studies suggest that breastfeeding-associated pain is linked with significant psychological stress; thus, mothers presenting with pain should be evaluated for mood symptoms and followed closely for resolution or treatment as needed. Timely identification and appropriate management of persistent breastfeeding-associated pain are crucial to enable women to achieve their infant feeding goals.

Although the literature on persistent nipple and/or breast pain is limited and the differential diagnosis is extensive, a number of etiologies and management strategies are emerging, most of which are based on expert opinion. The highly individual nature of the breastfeeding relationship combined with the complexity of the lactating breast, including its anatomy, physiology, and dynamic microbiome, adds challenges to the clinicians' efforts.

History and Examination

Assessment of persistent pain begins with a careful history and physical examination of both mother and infant, with particular attention to the following:

- Breastfeeding history
  - Previous breastfeeding experiences/problems/pain
  - Nipple/breast sensitivity before pregnancy
  - Milk supply (ongoing engorgement, high supply versus low supply)
  - Pattern of breastfeeding (frequency, duration, one, or both breasts)

[1]Department of Obstetrics and Gynecology, University of Texas Health Sciences Center at Houston, Houston, Texas.
[2]Department of Family and Community Medicine, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin.
[3]Department of Obstetrics and Gynecology, University of North Carolina School of Medicine, Chapel Hill, North Carolina.
[4]Carolina Global Breastfeeding Institute, Department of Maternal and Child Health, Gillings School of Global Public Health, Chapel Hill, North Carolina.

  - Expression of milk, frequency, hand expression, and/or type of pump
  - Mother's attitudes toward breastfeeding and her breastfeeding goals
- Pain history
  - Onset postpartum
  - Early nipple trauma (abrasions, cracks, bleeding)
  - Context (with latch, during breastfeeding, between breastfeeds, with milk expression)
  - Location (nipple and/or breast; superficial versus deep)
  - Duration (timing, intermittent, or constant)
  - Character (burning, itching, sharp, shooting, dull, aching)
  - Pain severity using rating scale, such as 0–10
  - Associated signs and symptoms (skin changes, nipple color change, nipple shape/appearance after feeding, fever)
  - Exacerbating/ameliorating factors (cold, heat, light touch, deep pressure)
  - Treatment thus far (analgesia, including nonsteroidal anti-inflammatory drugs and/or narcotic preparations), antibiotics, antifungals, steroids, herbs, lubricants, other supplements
- Maternal history
  - Complications during pregnancy, labor, and birth (medical conditions, interventions)
  - Medical conditions (especially Raynaud's phenomenon, cold sensitivity, migraines, dermatitis, eczema, chronic pain syndromes, candida infection, family history of ankyloglossia)
  - History of breast surgery and reason
  - Medications
  - Allergies
  - Depression, anxiety
  - History of herpes simplex or zoster in the nipple/breast region
  - History of recent breast infections
- Infant history
  - Birth trauma or abnormalities on examination
  - Current age and gestational age at birth
  - Birth weight, weight gain, and general health
  - Behavior at the breast (pulling, squirming, biting, coughing, shortness of breath, excessive sleepiness)
  - Fussiness
  - Gastrointestinal problems (reflux symptoms, bloody stools, mucous stools)
  - Medical conditions/syndromes
  - Previous diagnosis of ankyloglossia; frenotomy
  - Medications

Examination should include the following:

- Mother
  - General appearance (pale [anemia], exhaustion)
  - Assessment of nipples (skin integrity, sensitivity, purulent drainage, presence/absence of rashes, coloration, lesions)
  - Breast examination (masses, tenderness to light/deep pressure)
  - Sensitivity to light or sharp touch on body of breast, areola, and nipple
  - Manual expression of milk (assess for pain with maneuver)
  - Assessment of maternal mood using a validated instrument, such as the Edinburgh Postnatal Depression Scale
- Infant
  - Symmetry of head and facial features (including jaw angle, eye/ear position)
  - Oral anatomy (presence/absence of lingual frenulum, evidence of thrush, palate abnormality, submucosal cleft)
  - Airway (looking for nasal congestion)
  - Head and neck range of motion
  - Infant muscle tone
  - Other infant behavior that may give clues to underlying neurologic problems, for example, nystagmus

A breastfeeding session should be directly observed to assess the following:

- Maternal positioning
- Infant positioning and behavior at the breast
- Latch (wide-open mouth with lips everted)
- Suck dynamics—pattern of feeding, nutritive and nonnutritive sucking, sleeping
- Shape and color of nipple after feeding

If the mother is expressing milk, the clinician should directly observe an expressing session to assess the following:

- Hand expressing technique
- Breast shield/flange fit
- Breast pump dynamics, including suction and cycle frequency with the pump the mother is using
- Evidence of trauma from the breast pump

Laboratory studies, such as milk and nipple cultures (Table 2), may be considered based on the history and physical exam findings such as the following:

- Acute mastitis or mastitis that is not resolving with antibiotics
- Persistent nipple cracks, fissures, or drainage
- Erythema or rashes suggesting viral or fungal infection
- Breast pain out of proportion to examination (appear normal, but very tender, breasts or nipples)

Differential Diagnosis

The potential causes of persistent breast and nipple pain are numerous, may occur concurrently or sequentially, and include the following:

- Nipple damage
- Dermatosis
- Infection
- Vasospasm/Raynaud's phenomenon
- Allodynia/functional pain

Table 1 lists symptoms and management of the different diagnoses described below.

Nipple damage

Epidermal compromise increases the risk of developing infection and pain. Breastfeeding or using a breast pump to express milk can induce an inflammatory response in nipple skin, which may result in erythema, edema, fissures, and/or blisters.

1. Abnormal latch/suck dynamic
   - *Suboptimal positioning*. Often cited as the most common cause of sore nipples, suboptimal positioning of the infant during a breastfeed can lead to a shallow latch and abnormal compression of the nipple between the tongue and palate.[9–11] (II-2, III, III)
   - *Disorganized or dysfunctional latch/suck*: The ability of an infant to properly latch and breastfeed is dependent, among other factors, on prematurity, oral and mandibular anatomy, muscle tone, neurological maturity, and reflux or congenital abnormities, as well as maternal issues such as milk flow, breast/nipple size, and engorgement. Infants who are premature, have low oral tone, and reflux/aspiration or congenital anomalies that may be at risk for disorganized suckling.[12] (III) Evaluation of the infant for difficulty coordinating sucking and swallowing may be indicated.
   - *Ankyloglossia* (tongue-tie), recognized in 0.02–10.7% of newborns, involves the restriction of tongue movement (projection) beyond the lower gum[13] due to an abnormally short or thickened lingual frenulum. Poor tongue movement may lead to difficulty attaining a deep latch and is frequently associated with maternal nipple pain.[14,15] (II-3, I) Factors such as breast fullness, milk flow, nipple size and elasticity, infant palate shape, and height affect the impact of ankyloglossia on the mother's nipples. Not all infants with ankyloglossia cause problems for the breastfeeding dyad.
   - *Infant biting or jaw clenching at the breast:* Infants who bite or clench their jaws while breastfeeding may cause nipple damage and breast pain. Conditions that may lead to this behavior include clavicle fractures, torticollis, head/neck or facial trauma, mandibular asymmetry,[16] oral defensiveness or aversion (e.g., infants force-fed with ridged nipples [teats]), tonic bite reflex, nasal congestion, a response to an overactive milk ejection reflex, and teething. (III)
2. Breast pump trauma/misuse

   Because of the widespread use of breast pumps in many countries and the variability of consumer education, literacy, and support, there is significant potential for harm from breast pump use. In a survey in the United States, 14.6% of 1844 mothers reported injuries related to pump use.[17] (II-2) Injury may be either a direct result of pump misuse or failure or an exacerbation of pre-existing nipple damage or pathology. Observing the mother while using the breast pump may clarify the cause(s) of trauma (i.e., improper flange fit, excessive high-pressure suction, or prolonged duration).

Dermatoses

Breast dermatoses such as eczematous conditions or, less commonly, psoriasis and mammary Paget's disease may be responsible for nipple and/or breast pain in lactating women. Any of these conditions may be secondarily infected with *Staphylococcus aureus*, causing impetiginous changes such as weeping, yellow crusting, and blisters.[18] (III)

1. Eczematous conditions

   These conditions can affect any skin, but are commonly seen on and around the areola in breastfeeding women. Attention to the distribution of skin irritation and lesions may help identify the underlying cause/trigger. Eczematous rashes vary considerably.
   - *Atopic dermatitis (eczema):* This condition occurs in women with an atopic tendency and may be triggered by skin irritants and other factors such as weather and temperature change.[19]
   - *Irritant contact dermatitis:* Common offending agents include friction, infant (oral) medications, solid foods (consumed by the infant), breast pads, laundry detergents, dryer sheets, fabric softeners, fragrances, and creams used for nipple soreness.[18]
   - *Allergic contact dermatitis:* Common offending agents include lanolin, antibiotics (topical), chamomile, vitamins A and E, and fragrances.[18,20] (III)
2. Psoriasis

   Flares can occur during lactation sporadically (usually 4–6 weeks after the birth[21] (III) or as a response to skin injury (koebnerization) from latch, suckling, or biting.
3. Mammary Paget's disease (Paget's disease of the nipple)

   More common in postmenopausal women (60–80% of cases), but observed in younger women, this slow-growing intraductal carcinoma mimics eczema of the nipple. A unilateral, slowly advancing nipple eczema that begins on the face of the nipple is unresponsive to usual treatment, persists longer than 3 weeks, or is associated with a palpable mass should increase suspicion for Paget's disease.[18] Other findings consistent with the diagnosis are ulceration, moist erythema, vesicles, and/or granular erosions.[22] (II-2) Skin biopsy and referral for specialist treatment are necessary.

Infection

Although a number of studies have attempted to identify what, if any, microbe may cause persistent nipple/breast pain during lactation, the roles of bacteria and yeast remain unclear. Both *Staphylococcus sp* and Candida can be found on nipples and in breast milk of women with no symptoms.[23] (II-2) Additional theories suggest a role for virulence traits that make detection and elimination of potentially causative microbes extremely difficult. These include biofilm formation, consisting of bacteria alone[24,25] (III, III animal/in vitro studies) or mixed species of *Staphylococcus sp* and Candida,[26,27] (III, III animal/in vitro studies), as well as intracellular infection by small colony variants.[28] (III animal/in vitro studies)

1. Bacterial
   - *Superficial bacterial infection in setting of skin trauma:* Infection secondary to damaged skin, especially around the nipple–areolar complex, is a common occurrence. Impetigo and cellulitis may occur alone or concurrent with an underlying dermatitis.[18]
   - *Bacterial dysbiosis and lactiferous duct infection*: Bacterial overgrowth combined with biofilm formed by bacteria (possibly in conjunction with *Candida sp*) may lead to narrowed lactiferous ducts and inflamed

Table 1. Conditions, Symptoms, and Management of Persistent Nipple/Breast Pain

Condition	*Symptoms/signs*	*Management*
Infant ankyloglossia	Ongoing nipple damage and an infant with restricted tongue movement due to a tight lingual frenulum	• Frenulotomy/frenulectomy using scissors or laser by a trained health professional[44–46] (I, II-2, 1).
Breast pump trauma/misuse	Nipple or soft tissue injury/bruising	• Observe a pumping session. • Adjust level of suction or fit of flange.
Eczematous conditions	Erythematous skin *Acute* episodes: blisters, erosions, weeping/oozing, and crust formation *Chronic* eruptions: dry, scaling, and lichenified (thickened) areas. Lesions can be pruritic, painful, or even burning.[18,20]	• Reduce identifiable triggers. • Apply an emollient. • Apply low/medium-strength steroid ointment twice daily for 2 weeks (immediately after a breastfeed to maximize contact time before the next breastfeed).[20] • Use second-generation antihistamines for pruritus.[20] • Consider a short course (less than 3 weeks) of oral prednisolone or prednisone in resistant cases.[20,47]
Psoriasis	Erythematous plaques Clearly demarcated borders Fine silvery overlying scale	• Apply an emollient.[20,48] (I) • Apply low/medium-strength steroid ointment twice daily (immediately after a breastfeed) as first-line treatment.[20,48] • Avoid prolonged topical steroid use to prevent thinning of the nipple epithelium and delayed healing. • Topical Vitamin D creams or gels and phototherapy (UVB) are safe to use.[20,48] • Immunomodulating agents should not be used on the nipple due to the risk of infant oral absorption.[47]
Superficial bacterial infection associated with skin trauma	Persistent cracks, fissures Weeping, yellow crusted lesions especially in conjunction with other skin conditions Cellulitis	• Topical mupirocin or bacitracin ointment. • Oral antibiotics such as a cephalosporin or penicillinase-resistant penicillin[18,49] (I)
Bacterial dysbiosis	Bilateral dull, deep aching bilateral breast pain±burning Pain during and after breastfeeds Breast tenderness (especially lower quadrants)[29]	• Consider oral antibiotics such as a cephalosporin, amoxicillin/clavulanate, dicloxacillin, or erythromycin for 2–6 weeks.[20,29] • Indirect evidence to support that breast probiotics may assist the restoration of normal breast flora.[50,51]
Candida infection	Pink nipple/areola area Shiny or flaky appearance of the nipple Nipple pain out of proportion to the clinical findings Burning nipple pain and pain radiating into the breast[20,23]	• Topical azole antifungal ointment or cream (miconazole and clotrimazole also inhibit the growth of *Staphylococcus sp*) on nipples.[20] • Nystatin suspension or miconazole oral gel for infant's mouth.[20] • Gentian violet (less than 0.5% aqueous solution) may be used daily for no more than 7 days. Longer durations and higher concentrations may cause ulcerations and skin necrosis.[20,52] • Oral fluconazole (200 mg once, then 100 mg daily for 7–10 days) may be used for resistant cases. • Before prescribing fluconazole, review all maternal medications and assess for drug interactions. Do not use fluconazole in combination with domperidone or erythromycin due to concern of prolonged QT intervals.
Herpes simplex	Small, clustered exquisitely tender vesicles with an erythematous, edematous base Solitary small ulcer[20,53] Axillary lymphadenopathy[53]	• Oral antiviral therapy such as acyclovir or valacyclovir should be used in doses recommended for treating primary or recurrent Herpes simplex infections. • Prevent contact between lesions and the infant. • Avoid breastfeeding or feeding expressed breast milk to infants from an affected breast/nipple until the lesions are healed to prevent neonatal herpes infection.

(*continued*)

TABLE 1. (CONTINUED)

Condition	*Symptoms/signs*	*Management*
Herpes zoster	Pain and vesicular rash following a dermatome	• Oral antiviral therapy such as acyclovir or valacyclovir should be used in doses recommended for treating Herpes zoster • Avoid breastfeeding or feeding expressed breast milk to infants from an affected breast/nipple until the lesions are healed
Vasospasm	Shooting or burning breast pain with blanching and other color changes (purple or red) of the nipple associated with pain[38,39]	• Warmth (compresses, heat pads) following a breastfeed or whenever the mother experiences pain. • Avoid cold on the breasts and nipples. • Nifedipine 30–60 mg sustained release daily or immediate release 10–20 mg thrice a day for 2 weeks initially if pain persists.[54] (I) Longer treatment may be necessary for some women.
Allodynia/functional pain	Pain to light touch Clothing brushing against the nipple causes excruciating pain, or that drying their breasts with a towel is painful History of other pain disorders	• Round-the-clock nonsteroidal anti-inflammatory medications. • Propranolol starting at 20 mg thrice a day if not responding.[55] (I based on treatment of TMJ pain) • Antidepressants may also be effective (see ABM Protocol #18 Use of Antidepressants in Breastfeeding Mothers). • Consider evaluation for trigger points and treatment with massage therapy.[56]
Recurrent plugged (blocked) ducts	Localized tender cord of tissue, usually a few centimeters in size, which is usually reversible with expression	• Heat, direct pressure, and milk expression usually offer relief
Oversupply	Breast fullness, milk leakage	• Stop any overstimulation by not pumping or hand expressing between breastfeeds. Only hand express or pump in lieu of breastfeeding or if breasts are overfull before bedtime. • Block feeding is a strategy that many lactation consultants endorse, but is controversial with limited evidence. This involves feeding from one breast for a block of time, typically 3 hours. The other breast rests, allowing the fullness to provide feedback to the breast to reduce milk supply.[57] • Medication such as pseudoephedrine[58] and sage extract have been used to reduce milk supply as has the oral contraceptive pill containing estrogen.

Data to support management of persistent breastfeeding-associated pain are limited and based largely on expert opinion. Recommendations below are therefore based on Level III evidence, unless otherwise indicated.
TMJ, tempromandibular joint pain.

epithelium. (III) A relatively constant, dull, deep aching pain in both breasts is characteristic of this inflammation as well as tenderness to palpation on breast examination.[29] (II-3) Milk flow and ejection cause increased pressure and sharp shooting pain during milk ejection and breastfeeding. Recurrent blocked ducts, engorgement and oversupply, and nipple cracks and fissures may also be associated with this condition.[30] (III)

Factors that are thought to predispose a woman to developing dysbiosis and ductal infection include the following:

- History of similar symptoms during prior lactations[29]
- Previous episodes of acute mastitis
- Nipple cracks or lesions[29]
- Recent treatment with antifungals and/or antibiotics

Judicious use of antibiotics is encouraged and so the workup should include[29] (Table 2) the following:

- Nipple and breast milk cultures
- Wound culture if crack/fissure present

2. Candida infection
   - The association of Candida with nipple/breast pain remains controversial. Human milk does not inhibit growth of Candida in fungal cultures.[31] (II-2) Some authors have not found a correlation between symptoms and *Candida sp* identification,[32,33] (II-2, II-2) while others have,[34,35] (II-2, II-2) including one study using PCR technology.[23] (II-2)

Factors that are thought to predispose a woman to develop Candida infection include the following:

- A predisposition to Candida infections
- Thrush in the infant's mouth or in the diaper (nappy) area (monilial rash)
- Recent use of antibiotics in mother or child

Table 2. Culture Methods (Nipple, Breast milk) (III)

Methods for culture[59]
For all cultures, ensure that the person collecting the sample has clean hands and applied gloves and that the sample is labeled correctly (with right or left side) and transported appropriately.
Nipple swab (intact skin)
Moisten tip of a dry swab in culture tube media.
Sweep the swab in a zigzag pattern (reaching 10 different points) over the areola (avoid touching swab to breast skin).
Replace swab in culturette (holder for swab).
Label culturette with patient label and nipple side (left or right).
Repeat for contralateral nipple.
Nipple/areola fissure or open wound culture
Dry wound: Moisten tip of swab in culture media.
Rotate the swab in the wound for 5 seconds.
Place swab in culturette.
Milk culture
Ask patient if she would prefer to hand express milk herself or have the provider do so.
Cleansing the nipple
Place a towel in the patient's lap before irrigation.
Before milk expression, irrigate the nipple with sterile saline.
Blot the nipple with sterile gauze after irrigation
Cleanse each nipple with an alcohol wipe. Allow alcohol to dry.
Remove gloves and clean hands.
Apply clean gloves.
Position dominant hand in a ''C'' shape, with pads of the thumb and fingers $\sim$1.5 inches behind the nipple.
Push straight back into the chest wall.
Roll thumb and fingers forward to express milk without touching nipple directly.
Allow the first few drops of milk to fall onto the towel.
Express 5–10 mL of milk into a sterile cup without touching cup to nipple.
Repeat for contralateral breast.

3. Viral infection
   - Herpes simplex: Herpes simplex infection (HSV) that either predates lactation or is acquired from a breastfeeding child can infect the breast or nipples. HSV infection of the breast or nipple skin can result in neonatal transmission during breastfeeding, putting the infant at significant risk for morbidity and mortality.[36] (III) Culturing the blisters to confirm the diagnosis is optimal. Mothers should not breastfeed on the affected side and expressed milk should be discarded until the lesions have healed.[19,37] (III)
   - Herpes zoster: Herpes zoster may erupt along a dermatome that involves the breast. The rash often starts close to the spinal column on the posterior thorax and migrates peripherally along the dermatome toward the breast. Exposure to these lesions can result in chicken pox (varicella zoster) in unimmunized infants. In most situations, it should be treated similarly to a Herpes simplex infection and women should not breastfeed or use expressed breast milk from an affected breast until the lesions have healed.[19] Infants may be given Zoster immunoglobulin if appropriate.

Vasospasm

Vasospasm presents with blanching or purple color changes of the nipple accompanied by sharp, shooting, or burning pain.[38,39] (II-3, II-3) Women may report pain after breastfeeding, on getting out of a warm shower, or in the setting of cold temperatures, such as in the frozen food section of the grocery store. Symptoms may be bilateral or unilateral in the setting of current or past nipple trauma. Some mothers report a history of cold hands and feet, such as needing to wear socks to sleep or gloves in mild weather, or a formal diagnosis of Raynaud's syndrome. Women with a history of connective tissue disorders such as rheumatoid arthritis or prior diagnosis of Raynaud's phenomenon are at risk for vasospasm of the nipple.

Allodynia/functional pain

Allodynia is defined as sensation of pain in response to a stimulus, such as light touch, which would not normally elicit pain. Breast allodynia can occur in isolation or in the context of other pain disorders, such as irritable bowel syndrome, fibromyalgia, interstitial cystitis, migraines, temporomandibular joint disorders (TMJ), and pain with intercourse. Taking a careful history to assess for other pain disorders is important for informing treatment.

In the chronic pain literature, pain disorders are associated with catastrophization,[40] reduced psychological acceptance,[41] depression, and anxiety, and these psychological factors are associated with diminished treatment response.[42] (II-2) This literature suggests that mothers who present with breast allodynia, particularly in the setting of other chronic pain syndromes, may benefit from psychological therapy designed to treat chronic pain, given findings from studies of other chronic pain conditions.[43] (I)

Other etiologies

1. Recurrent plugged (blocked) ducts

   Plugged (blocked) ducts are very common among breastfeeding women and can be associated with persistent pain. Reducing an excessive milk supply is paramount in reducing plugged ducts. Reliance on expressing

rather than breastfeeding can increase the risk of blockages due to insufficient breast drainage. If there is redness, an infection should be ruled out, while an abscess should be ruled out if symptoms persist for more than 3 days.

2. Maternal oversupply

   Oversupply of milk can cause persistent breast and nipple pain. Mothers will typically complain of sharp breast pain or dull breast aching and breast tenderness when their breasts are quite full. Oversupply is very common in the first few weeks postpartum as the body adapts to the infant's milk supply needs. Milk expression should be minimized because it can lead to continued oversupply issues.

Recommendations for Future Research

There continue to be many controversies on management of persistent breast pain.

- More scientific study is needed on assessment and management of almost all potential causes, including infection, neuropathic pain issues, breast pump technology (e.g., proper fitting of breast shields), and management of lip-ties/posterior tongue-ties.
- Standardized assessment of breast pain is lacking to compare studies on severity and management.
- The role of central pain sensitivity and mood disorders in breastfeeding-associated pain also requires further study. Future studies should quantify maternal mood, pain catastrophization, and comorbid dysautonomias among women presenting with chronic breastfeeding-associated pain.
- There is still no consensus among lactation specialists regarding whether deep aching and sharp pain is attributable to a *Candida* infection, dysbiosis of typical bacteria present in breast milk, or a noninfectious etiology.
- Block feeding as a treatment for oversupply also deserves further study.
- Further research is needed to elucidate the causes of persistent pain and understand the complex interactions inherent in breastfeeding/lactation, including the principles of biofilms.

References

1. Amir LH. ABM clinical protocol #4: Mastitis, revised March 2014. *Breastfeed Med* 2014;9:239–243.
2. Division of Nutrition Physical Activity and Obesity. National Center for Chronic Disease Prevention and Health Promotion. Infant Feeding Practices Survey II: Results. Centers for Disease Control and Prevention. 2009. Available at www.cdc.gov/ifps/results/ch2/table 2–37.htm (accessed November 11, 2015).
3. US Department of Health and Human Services. Guide to Clinical Preventive Services: Report of the U.S. Preventive Services Task Force, 2nd edition. Washington (DC): US Preventive Services Task Force. 1996. Available at www.ncbi .nlm.nih.gov/books/NBK15430/ (accessed January 4, 2016).
4. Odom E, Li R, Scanlon K, et al. Reasons for earlier than desired cessation of breastfeeding. *Pediatrics* 2013;131: e726–e732.
5. Buck ML, Amir LH, Cullinane M, et al. Nipple pain, damage, and vasospasm in the first 8 weeks postpartum. *Breastfeed Med* 2014;9:56–62.
6. Li R, Fein SB, Chen J, et al. Why mothers stop breastfeeding: Mothers' self-reported reasons for stopping during the first year. *Pediatrics* 2008;122 (Suppl 2):S69–S76.
7. Amir LH, Dennerstein L, Garland SM, et al. Psychological aspects of nipple pain in lactating women. *J Psychosom Obstet Gynaecol* 1996;17:53–58.
8. Watkins S, Meltzer-Brody S, Zolnoun D, et al. Early breastfeeding experiences and postpartum depression. *Obstet Gynecol* 2011;118:214–221.
9. Blair A, Cadwell K, Turner-Maffei C, et al. The relationship between positioning, the breastfeeding dynamic, the latching process and pain in breastfeeding mothers with sore nipples. *Breastfeed Rev* 2003;11:5–10.
10. Morland-Schultz K, Hill P. Prevention of and therapies for nipple pain: A systematic review. *J Obstet Gynecol Neonatal Nurs* 2005;34:428–437.
11. Woolridge MW. Aetiology of sore nipples. *Midwifery* 1986; 2:172–176.
12. Lau C, Smith EO, Schanler RJ. Coordination of suck-swallow and swallow respiration in preterm infants. *Acta Paediatr* 2003;92:721–727.
13. Power RF, Murphy JF. Tongue-tie and frenotomy in infants with breastfeeding difficulties: Achieving a balance. *Arch Dis Child* 2015;100:489–494.
14. Ballard JL, Auer CE, Khoury JC. Ankyloglossia: Assessment, incidence, and effect of frenuloplasty on the breastfeeding dyad. *Pediatrics* 2002;110:e63.
15. Segal LM, Stephenson R, Dawes M, et al. Prevalence, diagnosis, and treatment of ankyloglossia: Methodologic review. *Can Fam Physician* 2007;53:1027–1033.
16. Wall V, Glass R. Mandibular asymmetry and breastfeeding problems: Experience from 11 cases. *J Hum Lact* 2006;22: 328–334.
17. Qi Y, Zhang Y, Fein S, et al. Maternal and breast pump factors associated with breast pump problems and injuries. *J Hum Lact* 2014;30:62–72.
18. Barankin B, Gross MS. Nipple and areolar eczema in the breastfeeding woman. *J Cutan Med Surg* 2004;8:126–130.
19. Schalock P, Hsu J, Arndt K. Lippincott's Primary Care Dermatology. Philadelphia: Wolter Kluwer Health/Lippincott Williams & Wilkins, 2010, pp. 29, 146–147, 174–175, 232–236.
20. Barrett ME, Heller MM, Fullerton Stone H, et al. Dermatoses of the breast in lactation. *Dermatol Ther* 2013;26: 331–336.
21. Mervic L. Management of moderate to severe plaque psoriasis in pregnancy and lactation in the era of biologics. *Acta Dermatovenerol Alp Pannonica Adriat* 2014;23:27–31.
22. Kollmorgen DR, Varanasi JS, Edge SB, Carson WE, 3rd. Paget's disease of the breast: A 33-year experience. *J Am Coll Surg* 1998;187:171–177.
23. Amir LH, Donath SM, Garland SM, et al. Does Candida and/or Staphylococcus play a role in nipple and breast pain in lactation? A cohort study in Melbourne, Australia. *BMJ Open* 2013;3:e002351.
24. von Eiff C, Proctor RA, Peters G. Coagulase-negative staphylococci. Pathogens have major role in nosocomial infections. *Postgrad Med* 2001;110:63–64, 69–70, 73–66.
25. Melchior MB, Vaarkamp H, Fink-Gremmels J. Biofilms: A role in recurrent mastitis infections? *Vet J* 2006;171:398–407.
26. Harriott MM, Noverr MC. Candida albicans and *Staphylococcus aureus* form polymicrobial biofilms: Effects on antimicrobial resistance. *Antimicrob Agents Chemother* 2009;53:3914–3922.

27. Adam B, Baillie GS, Douglas LJ. Mixed species biofilms of Candida albicans and *Staphylococcus epidermidis*. *J Med Microbiol* 2002;51:344–349.
28. Proctor RA, von Eiff C, Kahl BC, et al. Small colony variants: A pathogenic form of bacteria that facilitates persistent and recurrent infections. *Nat Rev Microbiol* 2006;4:295–305.
29. Eglash A, Plane MB, Mundt M. History, physical and laboratory findings, and clinical outcomes of lactating women treated with antibiotics for chronic breast and/or nipple pain. *J Hum Lact* 2006;22:429–433.
30. Delgado S, Arroyo R, Jiménez E, et al. Mastitis infecciosas durante la lactancia: Un problema infravalorado. *Acta Pediatr Esp* 2009;67:77–84.
31. Hale TW, Bateman TL, Finkelman MA, et al. The absence of Candida albicans in milk samples of women with clinical symptoms of ductal candidiasis. *Breastfeed Med* 2009;4:57–61.
32. Graves S, Wright W, Harman R, et al. Painful nipples in nursing mothers: Fungal or staphylococcal? *Aust Fam Physician* 2003;32:570–571.
33. Hale T, Bateman T, Finkelman M, et al. The absence of Candida albicans in milk samples of women with clinical symptoms of ductal candidiasis. *Breastfeed Med* 2009;4:57–61.
34. Andrews JI, Fleener D, Messer S, et al. The yeast connection: Is Candida linked to breastfeeding associated pain? *Am J Obstet Gynecol* 2007;197:e421–e424.
35. Francis-Morrill J, Heinig MJ, Pappagianis D, et al. Diagnostic value of signs and symptoms of mammary candidosis among lactating women. *J Hum Lact* 2004;20:288–295.
36. Parra J, Cneude F, Huin N, et al. Mammary herpes: A little known mode of neonatal herpes contamination. *J Perinatol* 2013;33:736–737.
37. Jaiyeoba O, Amaya MI, Soper DE, et al. Preventing neonatal transmission of herpes simplex virus. *Clin Obstet Gynecol* 2012;55:510–520.
38. Anderson JE, Held N, Wright K. Raynaud's phenomenon of the nipple: A treatable cause of painful breastfeeding. *Pediatrics* 2004;113:e360–e364.
39. Barrett ME, Heller MM, Stone HF, et al. Raynaud phenomenon of the nipple in breastfeeding mothers: An underdiagnosed cause of nipple pain. *JAMA Dermatol* 2013;149: 300–306.
40. de Boer MJ, Struys MM, Versteegen GJ. Pain-related catastrophizing in pain patients and people with pain in the general population. *Eur J Pain* 2012;16:1044–1052.
41. de Boer MJ, Steinhagen HE, Versteegen GJ, et al. Mindfulness, acceptance and catastrophizing in chronic pain. *PLoS One* 2014;9:e87445.
42. Bergbom S, Boersma K, Overmeer T, et al. Relationship among pain catastrophizing, depressed mood, and outcomes across physical therapy treatments. *Phys Ther* 2011;91:754–764.
43. Williams AC, Eccleston C, Morley S. Psychological therapies for the management of chronic pain (excluding headache) in adults. *Cochrane Database Syst Rev* 2012;11:CD007407.
44. Buryk M, Bloom D, Shope T. Efficacy of neonatal release of ankyloglossia: A randomized trial. *Pediatrics* 2011;128: 280–288.
45. Geddes DT, Langton DB, Gollow I, et al. Frenulotomy for breastfeeding infants with ankyloglossia: Effect on milk removal and sucking mechanism as imaged by ultrasound. *Pediatrics* 2008;122:e188–e194.
46. Dollberg S, Botzer E, Grunis E, et al. Immediate nipple pain relief after frenotomy in breast-fed infants with ankyloglossia: A randomized, prospective study. *J Pediatr Surg* 2006;41:1598–1600.
47. Butler DC, Heller MM, Murase JE. Safety of dermatologic medications in pregnancy and lactation: Part II. Lactation. *J Am Acad Dermatol* 2014;70:417.e1–e10.
48. Bae YS, Van Voorhees AS, Hsu S, et al. Review of treatment options for psoriasis in pregnant or lactating women: From the Medical Board of the National Psoriasis Foundation. *J Am Acad Dermatol* 2012;67:459–477.
49. Livingstone V, Stringer LJ. The treatment of *Staphyloccocus aureus* infected sore nipples: A randomized comparative study. *J Hum Lact* 1999;15:241–246.
50. Arroyo R, Martin V, Maldonado A, et al. Treatment of infectious mastitis during lactation: Antibiotics versus oral administration of Lactobacilli isolated from breast milk. *Clin Infect Dis* 2010;50:1551–1558.
51. Fernández L, Arroyo R, Espinosa I, et al. Probiotics for human lactational mastitis. *Benef Microbes* 2014;5:169–183.
52. Kayama C, Goto Y, Shimoya S, et al. Effects of gentian violet on refractory discharging ears infected with methicillin-resistant *Staphylococcus aureus*. *J Otolaryngol* 2006;35:384–386.
53. Dekio S, Kawasaki Y, Jidoi J. Herpes simplex on nipples inoculated from herpetic gingivostomatitis of a baby. *Clin Exp Dermatol* 1986;11:664–666.
54. Thompson AE, Pope JE. Calcium channel blockers for primary Raynaud's phenomenon: A meta-analysis. *Rheumatology* 2005;44:145–150.
55. Tchivileva IE, Lim PF, Smith SB, et al. Effect of catechol-O-methyltransferase polymorphism on response to propranolol therapy in chronic musculoskeletal pain: A randomized, double-blind, placebo-controlled, crossover pilot study. *Pharmacogenet Genomics* 2010;20:239–248.
56. Kernerman E, Park E. Severe breast pain resolved with pectoral muscle massage. *J Hum Lact* 2014;30:287–291.
57. van Veldhuizen-Staas CG. Overabundant milk supply: An alternative way to intervene by full drainage and block feeding. *Int Breastfeed J* 2007;2:11.
58. Aljazaf K, Hale TW, Ilett KF, et al. Pseudoephedrine: Effects on milk production in women and estimation of infant exposure via breastmilk. *Br J Clin Pharmacol* 2003;56:18–24.
59. UNC protocol. UNC School of Medicine at Chapel Hill staff. Health Care Professionals:OB Algorithms: Breastfeeding: Culture Collection Protocol. 2014. Available at http://mombaby.org/PDF/culture_protocol.2.0.pdf (accessed November 1, 2014).

ABM protocols expire 5 years from the date of publication. Evidenced based revisions are made within 5 years or sooner if there are significant changes in the evidence.

The Academy of Breastfeeding Medicine Protocol Committeee:
Wendy Brodribb, MBBS, PhD, FABM, Chairperson
Larry Noble, MD, FABM, Translations Chairperson
Nancy Brent, MD
Maya Bunik, MD, MSPH, FABM
Cadey Harrel, MD
Ruth A Lawrence, MD, FABM
Kathleen A. Marinelli, MD, FABM
Sarah Reece-Stremtan, MD
Casey Rosen-Carole, MD, MPH
Tomoko Seo, MD, FABM
Rose St. Fleur, MD
Michal Young, MD

For correspondence: abm@bfmed.org

Katherine McCreary, MD

Projects Completed During Residency:

Community Health Learning Experience:

Quit Smoking Group Visits for Residents of Madison Public Housing

Scholarly Project:

Topics in Maternity Care Article:

I wrote a "Topics in Maternity Care" article with Lee Dresang, which was published in the April 2018 edition of Evidence-Based Practice. We posed the question: "Does group prenatal care improve perinatal outcomes?". The bottom line from our research was as follows: "No difference was found in perinatal outcomes (preterm birth, low birth weight, small for gestational age [SGA], perinatal mortality) between group and individual care. However, women who participate in group prenatal care have a higher level of prenatal knowledge and readiness for labor".

Thank you to my fellow Wingroids for being such an awesome group of people to have learned from and worked alongside for the last three years - I will miss you! Thanks to my fellow residents for being there when the days got busy and the nights got long and for always finding ways to have fun. And thanks to Jared for being my partner through it all - I can't wait to enjoy our life together post-residency!

Katie spent her childhood in Green Bay, Wisconsin, and moved with her family to South Burlington, Vermont during her high school years. She stayed out east, earning both her bachelors and medical degrees from Tufts University. As a medical student, Katie was able to pursue her passion for nutrition and wellness through opportunities such as Tuft Outreach Nutrition Education (TONE). Through TONE, she provided nutrition education and counseling to patients at the student-run Sharewood Clinic, which primarily reaches an underserved community. She also coordinated the nutrition counseling program, including recruiting and training volunteers and creating resources for patients. Along with nutrition, Katie is also interested in women's health and hopes to pursue both of these further during residency. She is also interested in advocacy, and served as the Student Director of the Massachusetts Academy of Family Physicians, which provided her with valuable insight into the policies and politics often associated with medicine. In her free time, she enjoys cooking and baking, DIY and craft projects, running, and skiing (including heli-skiing).

Quit Smoking Group Visits for Residents of Madison Public Housing

On January 1, 2018, all of Madison's Community Development Authority (CDA) public housing apartment complexes went "smoke-free". This means residents are no longer able to smoke in their apartments or on CDA property. Three of these CDA apartment buildings are located near Wingra Family Medical Clinic (Romnes, Brittingham and Braxton Apartments). As such, we suspected many of the residents might be our patients.

We wanted to help these CDA residents in their efforts at smoking cessation so that they wouldn't risk losing their housing. I teamed up with Mukund and Divneet after they had already partnered with the Public Health Department and the CDA. At some point during the information-gathering stage (led by Div, Mukund, Public Health and CDA) group medical visits were identified as one possible way to help support smoking cessation efforts. Group medical visits happens to be an area of interest for me. I helped to arrange the details of the group visits themselves including assisting with recruiting participants, arranging time and location of groups, developing curriculum and co-facilitating group visits.

We decided to pilot our group medical visits at Wingra Clinic as having ready access to the EHR could allow for prescription of nicotine replacement therapy and other medications that aid in smoking cessation. We developed curriculum for a 4-visit series with the intention of hosting 2-hour visits weekly over the span of a month. Our curriculum was adapted from the "Stop Tobacco and Nicotine Dependence" (S.T.A.N.D.) curriculum published by a team in Stanislaus County, CA. We planned our visits for December 2017 to prepare participants for the January 1st smoking ban. We identified interested patients by advertising our group at a "Quit Smoking Fair" held at the CDA complexes as well as with the use of flyers distributed through the apartments.

Our initial intention was to use pre- and post-surveys to gage the efficacy of our intervention. Unfortunately, we had poor longitudinal participation in our first series of group visits at Wingra Clinic. As such, we moved the next series of group visits to the CDA apartments themselves. We were again met with lackluster attendance, which served as a wake-up call to us that perhaps these group visits were not meeting the needs of CDA residents.

Despite challenges with recruitment and poor attendance, our efforts were not entirely in vain. Wingra Clinic and the DFMCH now have an established working relationship with the Public Health Department and CDA. Additionally, the roll out of the smoking ban at CDA complexes has been successful, as the air in the complexes is notably free of smoke. The most rewarding aspect of this experience was running into one of the original group visit participants in February and hearing from her that she has been smoke-free as of December 31st! On a personal level, I gained tremendous insight and experience about how to plan and facilitate group visits.

I envision a few possible paths forward for this community project. Certainly, it would be worth speaking with CDA residents again about their ongoing needs. We may find that several residents have already successfully quit or that others do not wish to quit and so are smoking off CDA property. We may find that, in fact, there are several people who still wish to quit but that a group visit does not appeal to them. Another path forward is to continue the group medical visit model at Wingra Clinic but to open it up to any clinic patient who smokes, regardless of where they reside. This is the direction in which the project is currently moving, and Wingra residents may soon be partnering with Dr. Joe Eichenseher of the Erdman Access Clinic to bring this to life.

Acknowledgements:
A big thanks to my co-residents Divneet Kaur and Mukund Premukumar without whom this project wouldn't have existed and for letting me join the party a little late. To Wingra PGY2 Ben Traun for taking over the helm as we graduate. To Kirsten Rindfleisch for serving as our mentor and sounding board. To our community partners, Nina Gregerson of the Public Health Department and Laura Wichert, CDA Service Coordinator. And lastly, to our patients, for joining us on this adventure and never failing to teach us something new.

Interested in Quitting Smoking?

Brought to you by:

Public Health
MADISON & DANE COUNTY
Healthy people. Healthy places.

UW Health
University of Wisconsin Hospital and Clinics

tobacco FREE
Columbia-Dane County Coalition

CDA

UW Health Offering ***FREE*** Quit Smoking Classes for CDA Residents!

- **Create a Quit Plan**
- **Set a Quit Date**
- **Receive a Prescription for Quit Smoking Medication**
- **Receive ongoing support from UW Doctors/Staff**

Classes will be held at Wingra Clinic on the following Wednesdays from 3 - 5pm:
- Dec. 6, Dec. 13, Dec. 20 and Jan. 3

Please call Wingra Clinic for more information: 608.263.3111

Tina Ozbeki, MD

Projects Completed During Residency:

Community Health Learning Experience:

Verona Press

Scholarly Project:

FPIN - What is the Best Way to Identify Dehydration in Older Adults?:

Dr. Irene Hamrick and I co-wrote an FPIN looking for evidence of the best way to identify dehydration in older adults. The FPIN is currently undergoing peer review and has not yet been published. The evidence based answer: "Serum osmolality is the gold standard to identify dehydration in older adults. Physical findings are not accurate, but identifying fatigue and missed drinks between meals can be helpful (SOR C). Saliva osmolality can identify dehydration with moderate sensitivity and specificity (SOR C). BUN/Creatinine ratio and sodium are recommended and easy to measure but can be affected by many factors (SOR C)."

Tina Ozbeki grew up in a suburb of Detroit, which is where she first fell in love with the city. After earning her bachelor's degree from the University of Michigan in Ann Arbor, she returned to Detroit to pursue her medical degree at Wayne State University. As a medical student, she volunteered at free clinics in Detroit and spent time educating high school students about HIV and other sexually transmitted infections. She also volunteered with other Detroit-based community outreach groups such as Earthworks Urban Farm, PBJ Outreach, and the Detroit Water Brigade. In addition to her community work, Tina was active on campus as the leader of the Family Medicine Interest Group and co-president of the Internal Medicine Clerkship Committee. She also has strong interests in sports medicine and women's health. During her fourth year of medical school she spent a rotation in Chicago working as a Reproductive Health Extern with the Midwest Access Project. Tina is drawn to Family Medicine for its emphasis on preventive medicine and continuity of care. When she has some free time, Tina enjoys yoga, biking, traveling, and spending hours thinking about and planning her next meal.

Thank you to my amazing co-residents for making life so fun the last three years, and especially to Todd Domeyer and Anna Chase.

September 2015

To your health

Online diagnosis is no substitute for a doctor

I've only been a resident at Verona Clinic for four months, but almost every day, I hear some version of this complaint:

"I wasn't planning on coming in, but then I read on WebMD that this numbness and tingling could be a sign of diabetes!"

That's just a side effect of the Internet-heavy world we live in, where information about anything – maybe too much of it – is just a click away. But just like with everything else online, you have to be careful not to make too many assumptions about what you read.


Ozbeki

More and more patients are looking up their symptoms online, whether via Google or online symptom checkers such as the ones offered by WebMD or Mayo Clinic. Online symptom checkers can provide patients with information about possible conditions they may have, or they may direct the patient as to whether the symptoms need urgent or emergent care.

A recent review of online symptom checkers from a Harvard study showed that over one-third of American adults use the Internet to diagnose health conditions. The review concluded that across the 23 symptom checkers that were studied, the tools usually encouraged users to seek medical care in situations where self-care at home would be a reasonable option.

This is important to remember because self-care at home, when it is safe and reasonable, has the advantage of saving patients both time and money.

Not only that, the symptom checkers provided the correct diagnosis in just one-third of cases. Compare that to physicians accurately diagnosing patients in about 85 percent of cases.

The vast difference in accuracy can partially be explained by the fact that symptom checkers use algorithms, much like we learn to follow in medical school, but without the ability to integrate aspects of the history and physical exam that physicians can when we see you in office or the emergency room or talk over the phone.

Family members, friends, and patients ask me about what they have read about online all the time, and I usually respond by acknowledging their concerns and explaining my thought process and rationale for my medical decision making.

My colleagues and I sometimes struggle when patients come to the office fully expecting to be diagnosed with what they read on WebMD and are almost disappointed when we provide them with a different diagnosis.

Still, for some patients, the fact that the symptom checker brought them to me is a good thing. One was experiencing numbness and tingling in her feet, and I was glad that after a few years without seeing a physician, she had identified that she may have a concerning symptom of diabetes.

Her visit was an opportunity to talk about risk factors for a chronic disease that ran in her family, as well as evaluate other symptoms she had. But she also could have been better served by having regular visits to her doctor, where she could have had ongoing conversations about her risk factors for diabetes and possible testing if necessary.

After having some tests done in office, she was reassured that she did not have diabetes. But since she did have a family history of diabetes, that laid the groundwork for a discussion about monitoring it in the future.

Even better, she and I were able to start evaluating and treating her back pain, which she had been self-treating and was the real source of the numbness and tingling in her legs.

Her office visit was a great opportunity to establish care, begin to treat an acute problem and work to prevent a chronic disease that runs in her family.

Whether you start with an online symptom checker or simply have a question about a symptom, you can always call the clinic and speak to a nurse. The nurse can direct your question to a doctor or advise you that yes, that crushing chest pain you're feeling probably means you should go straight to the emergency room.

Those of us in the health care profession recognize that online symptom checkers are not going anywhere anytime soon, and knowing how Internet use is growing among all age groups, I expect them to become even more prevalent. They can be a great resource for patients, but they are not a substitute for going to the doctor, and they are often wrong.

So if you use symptom checkers to give yourself a preliminary diagnosis, make sure you follow up with your physician to get an opinion you can trust.

Tina Ozbeki is a first-year resident at the UW-Health Verona Family Medicine Clinic in Verona who has an interest in preventive medicine.

January 2016

Community Voices

Don't let winter keep you from exercising

Winter and snow are finally here in Wisconsin.

Although I just moved here in June, I'm from Michigan, so I'm no stranger to harsh winters. I've loved living in Wisconsin this summer; the area is so active with parks, lakes and bike paths galore.


Ozbeki

The beautiful weather made it easy to spend time outside, and I found myself staying active either "on purpose" with runs and bike rides, or "on accident," with days spent kayaking, paddle boarding, and walking from place to place as much as possible. Who wants to spend time in a car driving when it's 75 degrees and sunny?

Unfortunately, now that the weather is getting colder, I've noticed that I'm spending a lot less time outside and not being as active as I once was. In addition, since it is getting darker earlier, by the time I leave work, it is already dusk and I am tempted to spend some time in blankets on my couch rather than go outside.

The weather is only going to get colder for the next few weeks (or months!), so this is a great time to work on continuing (or starting) to stay active through the winter. It is believed that it takes 21 days, or three weeks, to form a habit, and the relatively mild winter weather we've had so far could be an opportune time to begin.

The Centers for Disease Control and Prevention recommends that adults get 150 minutes of moderate-intensity aerobic activity per week. In my personal experience, I find that I have to plan ahead and make a conscious effort" to get this done during colder weather months.

The good news is, the 150 minutes of activity can be split up into increments that are as short as 10 minutes at a time. Spending time on lunch break walking briskly outside with a co-worker can both warm you up in the chilly temps and help avoid an after-lunch work slump. It can also help you get to know your coworkers better!

With moderate-intensity activity, your heart rate increases and you may start sweating (especially with all those layers on), but you can still talk to your walking partner. Brisk walking and biking both count, as well as household chores such as mowing the lawn (or shoveling snow, when the time comes). As the snow starts coming, snowshoeing and cross-country skiing are also great ways to get your heart rate up this winter.

One of the keys to staying active is working to overcome barriers. I find that having plans with a friend to go to the gym or for a bike ride helps keep me accountable, in addition to serving as a social break in a busy schedule.

Checking out routes in advance can help if one of the barriers you face is not knowing exactly where to go. The company TrailLink has lists and descriptions of Verona walking, biking, and running trails on their website and phone app.

Safety is also key when staying active outside, no matter what time of year. Since it's getting dark early, it helps to wear reflective clothing to be visible to others and having lights on your bike when riding. It's also important to remember to stay safe in other ways.

Hopefully the weather will stay nice, but if the last two years have taught us anything, we should be prepared for the cold.

It is vital to wear layers to stay warm, especially gloves and thick socks to protect fingers and toes. Frostbite and hypothermia can be serious complications from being outside in the winter. When it gets too cold to be outside, it can be an opportune time to try a gently-heated yoga class or join a gym (and don't forget, shoveling snow does count as exercise).

Although the weather is cooling down and it will be several months before the boats are back out on the lakes, there are still plenty of ways to stay happy and healthy outdoors.

Tina Ozbeki is a first-year resident at UW-Health Family Medical Clinic in Verona who has an interest in sports medicine.

March 2016

Community Voices

Focus on dental health should start early

A few weeks ago, a woman brought in her almost 1-year-old son to our clinic for his well-child check. We discussed many aspects of her son's growth and development, including that he would be due for his first visit with a dentist.


Ozbeki

"Already?" was her response.

I explained to her that the American Academy of Family Physicians and American Academy of Pediatrics recommend a first dental visit at 1 year, which is an opportunity to meet the dentist and have the child be more comfortable with the dental office. This way, when the child is due for their first dental cleaning, the hope is that the dentist is not a foreign and scary place to them.

Dental health is an integral part of a person's overall health, but sometimes it gets pushed to the side. This can be for a multitude of reasons; cost, time, and fear are all some reasons that many children and adults do not get regular dental care.

It's wonderful that many children and adults go to their primary care physician for regular preventive visits, but many dental conditions are preventable and complications from not accessing regular care can lead to painful and expensive emergency dental visits. According to Public Health Madison and Dane County, more than 11,000 visits were made to Dane County emergency departments, urgent care centers, and primary care clinics for dental pain in 2010.

These visits usually cannot address the underlying cause of the dental pain and may only provide temporary relief for patients. If you need a tooth pulled or another dental procedure, such as a root canal, you will often still have to make an appointment with a dental provider.

In addition to the pain that can be a result of poor dental care, dental disease has been linked to heart disease, stroke, and obesity. It is important to think about good dental hygiene as a full body issue and not just related to your mouth!

Dental health is a lifelong issue – starting in pregnancy, a mother's oral hygiene can have lasting impacts for her baby. Poor oral hygiene may lead to increased rates of pre-term birth or low birth weight. On the other end of the spectrum, about 25 percent of seniors do not have their natural teeth, which can lead to compromised nutrition.

The most important thing any of us can do for our teeth is to brush them twice a day and floss once a day. As an added bonus, the tap water in Madison and Dane County contains fluoride, which is a mineral that makes teeth stronger and helps fight cavities, so drinking the city's tap water is actually beneficial for your teeth over bottled water.

And as always, avoiding smoking or chewing tobacco can protect teeth against discoloration or decay.

Of course, we can talk about how important dental hygiene is, but even with brushing and flossing daily, patients need access to a dentist. One of the biggest barriers to dental care is cost.

Public Health Madison and Dane County has resources for low cost dental care for Dane County residents. You can access these resources through the public health website, publichealthmdc.com/family/oralhealth or call 243-0354. The website also has some additional information about oral health that may be helpful for some people.

My patient a few weeks ago was happy to hear some helpful tips for her 1-year-old as his baby teeth start to come in. I told her it's important to make sure he didn't fall asleep with his bottle in his mouth, because that can cause cavities, and to avoid drinking sugary drinks like soda.

Starting children young with good oral hygiene can hopefully set the framework for a future without cavities, dental pain and unnecessary dental expenses. Of course, let's not forget the biggest perk — a shining smile.

Tina Ozbeki is a first-year resident at UW-Health Family Medicine in Verona who has an interest in preventive medicine.

July 2016

Take precautions to stay safe in summer

On a beautiful day last summer, my friends and I decided to drive out to Devil's Lake for a picnic and hike.

It was sunny and probably 80 degrees or more, but since there was also a breeze, it was easy to forget the true temperature.

My friends and I set up at a picnic table in the shade to have some snacks and then headed out for a hike. A few wrong turns and a couple of hours later, the heat started to take its toll on us.


Ozbeki

One of my friends started to feel lightheaded and dizzy, and it was then that I realized we definitely hadn't packed enough water. We found a spot in the shade to sit until my friend felt a little better, and then we turned around and walked back to our picnic spot. We made sure to rehydrate and cool down in the shade before heading home for the day.

The trip to Devil's Lake last summer really opened my eyes to how sunny summer days can escalate due to heat-related illness. And with the warmer weather, all the time we'll spend outside in the sun, playing in the pool or at the beach and other outdoor activities can come with other dangers, too.

It takes a little caution to make sure that you, your friends and your family can enjoy these gorgeous days without any sunburns, mishaps or trips to the doctor.

One of the most common summer problems is sunburns, which are both painful and damaging to the skin. Sunburns increase risk of skin cancer, as well as affecting the cosmetic appearance of the skin.

The best way to avoid sunburn may be obvious — to stay out of the sun. Understandably, this may not be feasible all the time.

The peak hours of sun exposure are between 10 a.m. and 4 p.m., so if possible, try to stay out of the sun during those hours. Otherwise, it is important to stay properly protected while in the sun.

According to the American Academy of Pediatrics, babies under 6 months should wear lightweight long pants, long-sleeved shirts and brimmed hats that shade the neck to prevent sunburn. Sunscreen with at least SPF 15 should be applied to areas that are not covered by clothing or shade. If a baby does get sunburn, cool compresses can be applied to soothe the skin.

Children and adults should also wear protective clothing, apply sunscreen that protects against both UVA and UVB lights and reapply sunscreen every two hours (or after swimming or sweating). Water and sand can reflect ultraviolet rays, so when spending time at the lake, be extra cautious.

Another common summer issue is avoidable injuries.

One of my favorite ways to get around town in the nicer weather and get some exercise in at the same time is biking. No matter what time of year, it is always important to wear a helmet while biking, rollerblading or skateboarding.

Concussions can be caused by a bump or jolt to the head and can occur with many different activities, but wearing protective equipment during the riskiest activities can help protect the brain.

If a head injury does happen to someone you know and that person becomes confused, has memory loss, loses consciousness or shows any other signs of disorientation, make sure he or she is evaluated by a medical professional. Don't just try to shake it off. Concussions can result in complications, so promptly seeing a doctor can help with monitoring and prevention of further events.

And of course, there are heat-related illnesses: both heat exhaustion and dehydration. Staying active in the heat means staying well-hydrated before, during and after activity.

When my friends and I went to Devil's Lake last summer, we hadn't thought about packing enough water. Even worse, a lot of the hike we were doing was not in the shade and some of us were not wearing appropriate clothing.

The best attire for outdoor activity is light-colored and lightweight, and if clothing gets sweaty, it should be replaced by dry clothing.

Frequent breaks are necessary when playing sports or staying active in the summer, and you should move to a cooler area if you feel dizzy, lightheaded or nauseated.

This season is a wonderful reprieve from the winter months, and hopefully with some of these tips, you can stay safe and stay cool.

Tina Ozbeki is a first-year resident at the UW-Health Verona Clinic who has an interest in preventive medicine.

September 2016

Community Voices

A quick shot can help prevent days of agony

A few years ago, my family planned to go to a college football game between Penn State – my dad's alma mater – and Michigan, where I went to college. Unfortunately, that morning, Dad woke up with fevers, chills, body aches, and a cough.

He's pretty healthy and does not get sick often, but he felt so unwell that he had to miss the football game he had been looking forward to all season.


Ozbeki

He found out later that he had caught influenza and missed a few days of work, too.

We all know the flu spreads throughout fall and winter, and flu season has officially begun this year, as of Sept. 1. Often, it can cause you to feel miserable and miss work or school for a few days, but it can also be a much more serious illness and lead to complications such as pneumonia.

In the 2015-2016 flu season, more than 1,500 people in Wisconsin were hospitalized for flu-related illness. Some ended up in the intensive-care unit.

Adults over 65 years old, pregnant women and those who have medical conditions such as diabetes and asthma, are at higher risk for complications from the flu.

Most people know the flu virus can cause an abrupt onset of fever, headache, body aches, fatigue and cough, among other symptoms. But less commonly known is that many adults can spread the flu even before their symptoms develop.

The virus spreads person to person through large droplets, like when an infected person coughs or sneezes within a few feet of another person. Even if you think you haven't been exposed to the flu, it may have spread even prior to someone knowing that they are sick.

The good news is, the flu vaccine can help reduce your risk of getting infected with the flu. My dad had not received the flu vaccine that year, which might have been able to prevent his illness.

The bad news is the flu vaccine is made prior to the start of flu season. Therefore, the effectiveness of the vaccine can vary from year to year and person to person.

Overall, the vaccine can reduce the risk of flu by about 50 percent to 60 percent. But if you do get influenza in spite of receiving the vaccine, your illness may be milder because you were vaccinated. Another important reason to get the flu vaccine is it can protect others in the community who may be more vulnerable to the flu, such as infants and the elderly.

UW Health Verona Clinic will be starting annual flu clinics on Sept. 26, and you can make an appointment to receive the flu vaccine here. You can also go to many pharmacies for the flu vaccines, and some workplaces also have flu vaccination days.

If you have had an allergic reaction to a flu vaccine, or are allergic to eggs or latex, check with a healthcare professional prior to getting the vaccine. The vaccine is recommended for most people ages 6 months and older.

One thing to note is that in years past, an intranasal flu vaccine (FluMist) has been offered in addition to the flu shot, but this year, FluMist will not be available. Don't worry, the shot hurts just for a moment, but then you can rest assured that you are doing good to protect yourself and others from influenza.

If, in spite of all best efforts, you do think you have been exposed to influenza, you can talk to your doctor about possibly taking an anti-viral medication that may reduce the duration of your symptoms. The medication works best when started within the first 48 hours of onset of symptoms.

There are risks and benefits with any medication, so it's important to discuss with your doctor if starting an anti-viral medicine is appropriate for you.

Ideally, no one will have to miss a highly-anticipated football game or other event due to the flu virus. I know that is a lofty goal, but I hope that you choose to get the flu vaccine so that we can reduce how many people are affected.

Tina Ozbeki is a second-year resident at the UW Family Medical Clinic in Verona with an interest in preventive medicine.

May 2016

It's worth the time to get good nutrition

One of my favorite parts of being a family physician is that many of my patients are part of the same family.

I might see a child for their well-child check and also see his parents or siblings for their routine visits. A discussion I have with one family member applies to other family members, as well.


Ozbeki

One thing I often ask about when either children or adults come in for a preventive visit is nutrition. That's because keeping consistent, positive nutritional habits is a barrier many people face – myself included – particularly when it comes to spending the time to make meals at home.

Eating meals out can be more convenient and even less expensive than cooking at home. It can feel time-consuming to cook dinner on a regular basis, especially when you include the time to plan meals and grocery shop.

One solution some of my patients have had success with is turning meal preparation into a family activity. When parents and kids work on meal planning and food preparation together, what at first seems like a "chore" can turn into a productive and enjoyable time with each other.

Grocery shopping can also become quality family and social time. One of the ways I stock up on fresh produce for the week is to go to the Dane County Farmers' Market every Saturday morning. That quickly becomes a social activity with friends and family.

There are other local farmers markets as well, including in Fitchburg, Middleton and Oregon. I have used the weekly farmer's market as a guide for what is in season, and plan my meals based on what looks good to me at the market that week. Of course, I can never pass up the opportunity to indulge in a fresh-baked scone or muffin while I'm there too!

Sometimes, having more structured meal plans can help, as well. There are tons of online resources for meal plans.

A website that I love is "100 Days of Real Food" — there are options for meal plans on a budget that use whole, unprocessed ingredients. Another great resource is using grocery stores.

Hy-Vee in Fitchburg, for example, has a dietitian who offers free nutrition advice and shopping assistance. In addition, twice a week on Saturdays, Hy-Vee hosts "Kids in the Kitchen," where children can learn how to make some foods and learn about food groups.

On the other end of the spectrum, you and your family can plant a garden together. In fact, the UW-Health Verona Clinic has a community garden, of which much of the produce is donated to Badger Prairie Needs Network.

I definitely do not have a green thumb, but for the past few years, I have tried to keep some common herbs alive to have on hand for recipes. This year, I'm even going to try to grow some tomatoes (wish me luck!).

After you decide what to cook and shop for groceries, the next step is actually cooking the meal. This is an area school-aged children can still be involved in. Helping measure, wash and chop foods, while learning safe kitchen skills are all parts of the food preparation that kids can be involved with.

Eating breakfast and lunch at home can sometimes be even more difficult than making dinner. Sometimes, running out the door in the morning means I may be tempted to skip breakfast, so I've made it part of my evening routine to prepare the next morning's breakfast. I might soak oats overnight in a Tupperware container to take to work in the morning, or pre-chop vegetables for an egg scramble to make in the morning.

Oftentimes, leftovers from dinner can be used as packed lunches.

Spending a few extra minutes making larger portions can result in more food available for the rest of the week. A lot of times, the same side dishes can be repeated for meals throughout the week, as well.

An important part of a person's overall health includes healthy nutritional habits, but making sure that they are consistent with a family's lifestyle is important, too. Preparing and enjoying meals together can lay the groundwork for a healthy lifestyle, but also benefit families in other far-reaching ways.

Tina Ozbeki is a first-year resident at the UW-Health Verona Clinic who has an interest in preventive medicine.

November 2016

Community Voices

Being healthy for the holidays means body, mind and soul

Next week is Thanksgiving, and therefore the unofficial start of the holiday season.

Although I'm excited to travel and spend the holidays with my family, I also recognize that the holidays can be a stressful time for many of us for many reasons.

There can be a lot of anxiety surrounding the holiday season. Family visiting from near and far often means the house has to be prepared and cleaned, and we have to be ready to provide meals and entertainment.

Ozbeki

If you are stressed about the holidays, focusing on your mental health is important during this time. Find what is helpful for yourself and makes you happy when dealing with stress.

Taking care of yourself during this time can help you truly enjoy time with your loved ones. For some people, this may mean breaking away from family time to watch a movie alone, taking your dog for a walk, meditation, or yoga.

Another source of stress around holidays surrounds gift-giving, but it's important not to neglect our financial health.

Trying to curb spending can be difficult, but there are ways to help reduce spending. Secret Santa or White Elephant gift exchanges among family members and friends can reduce the amount of gifts you have to buy, while also making gift-giving a fun game. Another idea is do-it- yourself gifts; handmade presents and heartfelt cards are often even more appreciated than store-bought ones.

In addition to taking care of our emotional and financial health around the holidays, we all know that the holidays can also be a time of overindulgence. Trying to stay on track with our physical health is vital, too.

Portion control can be difficult. It's hard to say no during holiday meals, and even harder in the weeks leading up to Thanksgiving and Christmas. My co-workers have been bringing in delicious desserts to work on an almost daily basis, and it has definitely been tough not to have a taste (or two, or three) each time someone brings a treat in. I try to pick a one favorite treat to enjoy in order to limit excess.

One helpful website is choosemyplate.gov. It has information on appropriate portion sizes and food groups. This can be a helpful website to peruse before heading in to Thanksgiving dinner.

Another helpful tip is to try to focus on eating a variety of foods and to not be afraid to say no to second helpings when I am feeling full – even though that can sometimes be hard when grandma is insisting on more!

Eating slower can also help with portion control, because it can take some time for our bodies to register that we are full. Alcohol intake can also add to excess unnecessary calories during a holiday meal, especially heavier drinks such as eggnog. Recommended servings for alcohol are up to one drink per day for women and up to two drinks per day for men.

Last, but certainly not least, is trying not to neglect exercise during the holidays. Taking a walk with family before or after a meal is a great way to spend time together while also staying active. If your family enjoys shopping, such as on "Black Friday,"taking an extra lap or two around the mall can be a great way to get some extra steps in. Taking the stairs in the mall instead of the elevator or escalator is another way to build in some more physical activity.

Formal exercise classes or visits to the gym can also be a great option with your family. Oftentimes, gyms can have free classes or discounts for first-timers or out-of- town visitors.

Hopefully these tips can help maintain your physical, emotional, and financial health during a potentially demanding end of the year.

Tina Ozbeki is a second year resident at UW Health Family Medicine in Verona with an interest in preventive medicine.

January 2017

Community Voices

Don't just roll over and accept sleeping problems

One of my patients came to me this month to discuss her frustration with her sleeping schedule, which had been disrupted by a trip to visit family over the holidays.

"Ever since I got back from California last week, I haven't been able to fall asleep at a decent hour!" she complained. That meant she couldn't rest adequately for work.

Traveling is one of many reasons I hear patients tell me they've stopped sleeping well, but poor sleep is a common problem all over the country. About 50-70 million Americans are affected by a sleep disorder, whether it is temporary such as jet lag, or something more lasting, like a chronic sleep condition.

Ozbeki

Most adults need 7-8 hours of sleep per night, and teenagers and children need even more than that. Chances are, you or someone you know had sleep issues at one time or another.

Thankfully, there are ways to alleviate them. I told my patient that methods to help with jet lag include trying to get outside during daylight, which can help regulate our circadian rhythm, and trying to slowly adjust to the new time zone for a few days prior to travel by adjusting your sleep schedule.

More chronic difficulties sleeping, either having trouble falling asleep at night or waking up in the early morning hours, can be detrimental to quality of life. Adjusting your routine can help. First, some people are naturally "night owls" or "early birds." Recognize if you are someone who naturally falls asleep later at night or wakes up early in the mornings, and try to adjust your sleep cycle accordingly.

This can definitely be difficult though, given work and school schedules. In general, going to bed at the same time each night and rising at the same time each morning can help with sleeping difficulties, and you should try to maintain this schedule on weekends or days off work. Making sure your bedroom is quiet and dark may sound like common sense, but it is still worth mentioning. An eye mask or ear buds can be helpful if you have street lights streaming in through windows or live in a louder household.

Another practice that can help is limiting use of your bed for sleeping, not watching television or using your laptop. This way, your body recognizes that when you get in bed, it's time to go to sleep.

Another aspect to keep in mind is the light emitted from a laptop or phone screen can disrupt your circadian rhythm. There is a setting on some newer phones that will adjust the amount of light emitted from the phone, but this still is not perfect and should not be used as an excuse to use your phone in bed.

Avoiding large meals or exercise right before bed can also help regulate your sleep cycle. Generally, regular exercise helps with sleep regulation, but should be done a few hours before bed if possible. And of course, checking with your physician and making sure you are not taking any medications or supplements that could be disrupting your normal sleep cycle can also help.

If you do wake up throughout the night and end up lying awake for more than 20 minutes, get up and go to a different room and participate in a quiet activity such as reading, and then return to bed when you feel sleepy.

Sometimes, sleep disturbances or persistent fatigue can be a sign of a medical problem, such as depression, or a sleep-related problem such as sleep apnea or narcolepsy. Evaluation by a physician can help distinguish a cause of sleeping difficulties and start next steps for diagnosis and treatment.

There are a wide variety of therapies that can help – some that should be started under the direction of a physician – while others you can start on your own (including progressive muscle relaxation or guided imagery).

Many phone applications have been released recently to help monitor sleep habits, and although none of them have been well-studied by the medical community, they can be an option to try.

If you do want to be evaluated by your physician for sleep issues, it may be helpful to keep a sleep diary for about two weeks prior to your appointment, including when you go to bed, go to sleep, consume alcohol or caffeine, et cetera.

Whatever you do, being consistent and not simply accepting bad sleep is crucial. Thankfully, my patient was quick to bring her problem to me, and after trying some options to improve her sleep, she was able to successfully sleep a solid eight hours and return to functioning her best at work.

Tina Ozbeki is a second-year resident at the UW Family Medicine Clinic in Verona with an interest in preventative medicine.

October 2017

Community Voices

Limiting screen time is an individual family decision

One of my roles as a family doctor is advice and counseling for patients and their families. A question that parents often ask me is how much time their child should be spending on the computer or tablet.

This issue has been evolving over the past 20 years, as screens of all sorts permeate our lives. The increased prevalence of tablets and computers at home and at school has made "screen time" a point of concern for many families and physicians.

Ozbeki

The American Academy of Pediatrics (AAP) used to have a recommendation for how many hours of screen time children should be limited to, but that has recently changed. Instead, they recommend that families develop a "family media plan," which takes into account the needs of each member of the family.

The plan outlines screen free zones, screen free times, curfews for screen time, all tailored to each family member's health, education, and entertainment needs. This way, an older child who needs to use the computer for homework won't necessarily have the same screen time rules as a younger child.

The media use plan also recommends families discuss the benefits of decreasing screen time and consider what the family will have time to do together instead of using screens.

It's not only important to spend an appropriate amount of time accessing media and using screens, but also to be safe while doing so. Cyber bullying and internet scams are unfortunately all too common.

For this reason, another portion of the AAP media plan reviews rules for "digital citizenship" and "digital safety," which is an avenue for teaching children about proper rules for safe internet use. You can find a template for the family media plan at healthychildren.org.

Make no mistake, monitoring screen time and Internet use is not just for kids. The AAP recommendations and media plan could easily be applied to all ages.

I myself have had a harder time than usual over the past few months pulling myself away from the computer due to an onslaught of news stories. Whether I am deliberately seeking out the news or just checking a social media feed, it seems that every moment there is a post about happenings across the state, country, and world.

I have been trying to balance an appropriate amount of media consumption with a desire to stay up to date on the latest news. I have also talked to patients who have been struggling with the same issue.

In patients with anxiety or depression, overconsumption of media can lead to worsening symptoms. Mental health can take a downturn by nature of depressing or discouraging news stories or even just from the isolation that can result from spending hours perusing news sites or social media feeds.

One way to protect yourself from this is by specifically seeking out uplifting news, which can help boost your mood. I find that after reading about an unsettling news event, I feel less hopeless if I also read a news story about a way that people are coming together to help or support one another.

Taking action in some way when learning about a disheartening event can benefit the community and also assuage how you feel about the event.

Monitor your social media habits and screen time carefully, and make a goal to intentionally cut yourself off. You can use an app on your phone or computer which tracks time on certain websites, or have your friends or loved ones keep you accountable.

Another good suggestion is to always try to turn off any screens (television, computer, tablet, or phone) at least one hour prior to bedtime so that it does not interfere with your sleep cycle.

To answer my patients' questions, there is no clear answer for how much time you or your children should be spending on screens. It is a family discussion and individual choice to make, but hopefully some of these tips and resources can be of value.

Tina Ozbeki is a second-year resident at the UW Health Family Medicine Clinic in Verona with an interest in preventive medicine.

August 2017

Mindfulness practice can bring mental, physical benefits

A recent college graduate came to our clinic the other day, just a few weeks into working at his first post-graduation job.

He felt overwhelmed and anxious with the new responsibilities, with little time to focus on his health and well-being. And I could relate – being a medical resident often means long hours at work, with what seems like almost no time to focus on my own health.


Ozbeki

Thankfully, I have learned about and started implementing a practice called mindfulness into my daily routine. I told my patient I have had patients who have found benefits of mindfulness for a long list of issues including stress reduction, insomnia, headaches and attention.

Essentially, it's is an effective way to help cultivate coping skills and strategies. Or as the UW Health website put it, it's "a way of learning to relate directly to whatever is happening in one's life," including everyday stress, pain and illness.

In addition to stress reduction, the American Psychological Association finds the benefits of practicing mindfulness to include more focus, fewer depressive symptoms and less emotional reactivity. That can translate into many health benefits.

Mindfulness is not the same as meditation, but the most common mindfulness practice usually does include an aspect of meditation. Mindfulness can also be practiced through breathing techniques, yoga, tai chi and other modalities.

As I discussed the practice with my patient, I explained how this might benefit him. The way I generally try to explain it is that it's as a state of being fully present in your mind, without judgment.

This is definitely easier said than done.

The best way to learn mindfulness is to try it out for yourself. Some resources to get started include an introductory course offered by UW Health for adults, as well as middle and high school students. The website Calm.com (also available as a smartphone app) has a beginner's introduction to mindfulness with guided meditations. Insight Timer and Headspace are also available apps for mindfulness and meditation.

The benefits of mindfulness are apparent not only for adults and teens, but for children, as well. Though children can also benefit, they need to learn the skills differently.

The benefits for children are similar to those for adults, but as anyone who has a child or has babysat children before will know, it can be difficult to have them sit still for any significant amount of time to focus on their breath and thoughts.

There are programs available for children to participate in mindfulness. If you are interested in teaching your child more about mindfulness, a local Verona school district teacher (who is also a certified yoga instructor) has started a mindfulness curriculum for students called "Beginner's Mind," as well as a toolkit that parents can use at home. Using these tools, parents and teachers can help teach children about the practice of mindfulness.

The "Beginner's Mind" toolkit touts benefits of mindfulness for children as improving self-control and impulsive behaviors, increasing attention span and increasing kindness and compassion for others, among other benefits.

Although my patient at first thought mindfulness wasn't a good fit for him, he gave it a shot anyway. He later told me that after a few weeks of practice, he could feel the benefits of stress reduction.

I'd had a similar experience. It also took me some time to get used to mindfulness, but I have personally have also reaped benefits for stress reduction, better sleep and more focus.

Mindfulness is a tool that can be used for all ages and for a multitude of health and wellness concerns. I encourage you to investigate some at home resources to learn more about it or ask your doctor if you have more questions

Tina Ozbeki is a third-year resident at UW-Health Family Medicine Clinic in Verona.

March 2017

Back pain can often be prevented, managed

This past winter, on a trip with family, we walked many miles a day sightseeing.

One morning near the end of the week, I woke up and had low back pain – my low back hurt at rest, when standing, but especially with walking.

If you've been fortunate enough to never experience low back pain yourself, chances are you know someone who has struggled with it. Low back pain is the third-most common reason patients seek medical care.


Ozbeki

It can be caused by trauma, a sudden movement that may cause muscle strain or ligament sprain, arthritis, osteoporosis or many other reasons. Approximately one-fourth of adults reported having low back pain lasting at least one day in the past three months.

Back pain can be acute (less than one month), subacute (1-3 months) or chronic (more than three months), but no matter how long you have it, it can be frustrating to deal with and can lead to missed days of work and decreased productivity.

Many people wonder what they can do when they are hit with a bout of back pain. Thankfully, most people do not require medicine or surgical procedures.

A group of physicians (American College of Physicians) looked at the evidence for treatment of low back pain and published a series of guidelines earlier this year for how to best treat back pain. They looked at improvement in pain, function, quality of life, patient satisfaction and adverse effects as part of their evaluation for how to best treat it.

One of the conclusions was that most patients with acute or subacute low back pain will improve with time regardless of treatment. Therefore, treatment that does not use medicine should be part of the first line.

These treatments include using heat (such as in a heating pad), massage, acupuncture and spinal manipulation (such as with osteopathic physicians or chiropractors). You should try to stay active as much as you can and avoid bed rest, because not using the back muscles can actually make pain worse.

If back pain unfortunately progresses to being chronic, recommended treatments include exercise, acupuncture, yoga and many other options that do not include medicines.

If those treatments don't work, consideration can be made to using anti-inflammatory medications such as ibuprofen.

Of course, there are always situations in which back pain should be evaluated by your doctor to determine what management option is best for you.

If back pain has been present for less than one month and does not radiate down the leg, it is usually okay to save yourself a trip to the doctor. If the back pain is lasting over a month, radiates down the leg or causes numbness or tingling, you should let your doctor know. As always, if you're unsure whether you should be evaluated, you should call your clinic and ask.

Sometimes it helps to get images, such as X-rays or MRIs, but it depends on your symptoms and how long they have lasted and a lot of the time, an X-ray or MRI may show abnormalities that are not truly the cause of an acute episode of back pain or show no abnormalities at all.

Back pain is no fun, and we should all do what we can to prevent it. Being in good general health and keeping good posture are both crucial.

A strong core (abdominal and back muscles) can help support your spine. Regular exercise that includes core-strengthening (such as yoga or pilates) could potentially protect you from injuring your back.

Maintaining a healthy weight can also potentially prevent bouts of low back pain since there is less stress on the joints.

Our mothers always told us to stand straight with good posture, and it's true, that is good advice to protect our backs. Poor posture places pressure on the spine.

Be cognizant of your posture both when sitting and standing and try to use an ergonomic chair if you have a desk job. Desks that transition from sit to stand can also be helpful for some people, although for some they can exacerbate back pain, so it is definitely not a "one-size-fits-all" approach.

Prevention isn't foolproof, so next time you or someone you know is hit with a bout of low back pain, keep these tips in mind.

For my own bout of back pain, it did slow down the rest of the vacation, but thankfully, it improved after a couple weeks. Hopefully, if it happens to you, a heating pad, a massage, and some time will help you improve, as well.

Just don't forget, your doctor is always available to answer questions if you're unsure what to do first.

Dr. Tina Ozbeki is a second-year resident at UW-Health Verona with an interest in preventative medicine.

Mukund Premkumar, MD

Projects Completed During Residency:

Community Health Learning Experience:

Smoking Cessation Group Visits for Residents of Public Housing

Scholarly Project:

Is Eczema in Infancy Associated with Later Food Allergy in Childhood?:

Children with atopic dermatitis (AD) have had widely varying estimates of IgE mediated food allergy, from 15-40%. HealthNuts, a prospective cohort study, found that infants with eczema are approximately five times more likely to develop IgE-mediated food allergy than infants without eczema. There is no recommended diet for children with AD. An elimination diet should only be considered after true food allergy has been diagnosed, preferably by oral food challenge. Of note, there is data to suggest that introducing allergenic foods to infants with severe eczema, if tolerable, reduces the risk of allergy later in life.

I'd like to thank my family for their unconditional support throughout this entire process. Much thanks to faculty, fellow residents, DFMCH staff, and Wingra staff for shaping me into the doctor I have become and for providing continual inspiration to become the doctor I want to be.

Mukund Premkumar grew up in Ames, Iowa. After venturing south for a bachelor's degree in economics from Rice University in Houston, he returned to the University of Iowa for medical school. As a medical student, Mukund participated in the Community Health Outreach Service Learning Elective, which focused on social determinants of health and community organization. As his project for the elective, he worked to pair medical students with patients to increase health literacy through counseling on chronic disease management, nutrition, and physical activity. During medical school Mukund also served as the health education chair and physician recruiter with the University of Iowa Mobile Clinic and as a volunteer with Local Food Connection, a non-profit that delivered local vegetables to low income residents. He also completed a summer research fellowship with the Centers for Disease Control researching the CDC's role in addressing health disparities through diversity practices. Mukund's other medical interests include global health, patient narratives and advocacy, health education, and medical student education. Outside of medicine, Mukund enjoys basketball, cooking, hiking, and board games.

Smoking Cessation Group Visits for Residents of Public Housing

Background: The city of Madison instituted a smoking ban in public housing units on January 1, 2018. The Community Development Authority (CDA) administers 742 public housing units (approximately 1300 individuals) in the City of Madison for low-income families, people over the age of 50, and individuals with disabilities. Among this population, the smoking rate was about 35%. In anticipation of this upcoming smoking ban in public housing and in conjunction with the Department of Public Health, we (myself, Divneet Kaur, and Katie McCreary) created a curriculum of smoking cessation group visits. Data was sourced from Department of Public Health and with help with Wen-Jan Tuan from the DFMCH.

Objectives: Smoking is one of the top causes of morbidity and mortality and more so for Madison residents of public housing, a population with significant psychiatric comorbidities. The goals of the project were to provide both pharmacologic and non-pharmacologic methods to help these residents quit smoking. This was done in collaboration with the Department of Public Health. With regard to non-pharmacologic therapy, our goal was to institute a curriculum for group smoking cessation visits.

Methods: Collaboration with Wen-Jan Tuan allowed for identification of all UW patients who were smokers and residents of the public housing. Data revealed a very high rate of depression (38%) and schizophrenia (30%). Given this, research had to be done on the most efficacious and safe methods of pharmacologic smoking cessation. For my primary care conference, I investigated the adverse neuropsychiatric side effects of smoking cessation. I found that, despite popular conception, Varenicline is safe in patients with psychiatric comorbidities. Throughout the process, our team was in contact with the Department of Public Health and the Community Development Authority to coordinate community outreach. We sourced our smoking cessation curriculum through multiple online syllabi and offered a series of 4 group visits to residents of Romnes, Brittingham, and the Triangle apartments.

Results: With regard to the community, we provided smoking cessation classes both at Wingra as well as the apartments. Because of the learning experience, we were able to get community contacts within the CDA and department of Public Health. Additionally, in the future, Wingra residents now have a framework in which to continue future group smoking cessation visits.

Conclusions: Through interacting with this community and creating smoking cessation plans, we were able to see the intersection of mental illness, social isolation, and tobacco addiction. The difficulty in community outreach to such a population became apparent when our group visits had poor attendance. However, for those who came, it was apparent that the group visit provided a needed social outlet. This project impressed on me the importance of social networks creating positive behavioral change and I plan to keep that in mind during future clinical situations.

Acknowledgments: Kirsten Rindfleisch, Department of Public Health-Nina Gregerson and Ryan Sheahan, CDA-Laura Wichert, Robin Lankton, and Wingra Health Coaches

Paul Stevens, MD

Paul was born in Green Bay, WI and completed his B.A. in Biology from Lawrence University in Appleton where he met his wife, Elizabeth. He went on to earn his medical degree from the University of Wisconsin School of Medicine and Public Health. He brings to family medicine an interest in improving the human intersection of medicine and technology. During his residency training, Paul enjoyed the continuity of care, breadth of practice and emphasis on preventative healthcare. Outside of medicine, Paul enjoys being involved with music (he was a percussionist with the Civic Symphony of Green Bay for nearly a decade). He also enjoys spending time with his active young family by running, cross-country skiing and enjoying the outdoors in the NEW and Central Wisconsin area. Paul is excited to be returning to Appleton to work with ThedaCare at the Appleton North clinic.

Projects Completed During Residency:

Parenting and Infant Development Project:

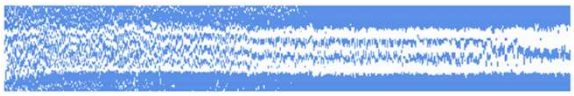
Sleep like a Baby: from Chaos to Stability

St. Clare Hospital CME Presentation:

Pneumonia Review and Update on Steroids and Procalcitonin:

Hospital CME with pertinent clinical updates for risk-stratification, diagnosis, and treatment of pneumonia. Also reviewed updated local antibiogram data and treatment algorithms. Discussed role of steroids in pneumonia treatment and the utility of the biomarker procalcitonin (PCT) in multiple settings. Also reviewed recommendations for pain control and prevention of secondary pneumonia in the setting of rib fracture. As a result, PCT is being considered for new local lab implementation. This would greatly improve turnaround time and help treat patients with bacterial infections by assessing their response to antibiotics and leading to improved antibiotic stewardship with less adverse events related to unnecessary antibiotic usage.

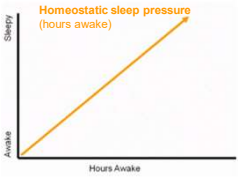
A heartfelt thank you to my wife (Elizabeth) and extended family who have been great supports throughout my training. Thank you to my resident colleagues and residency for their support to me both professionally and personally, especially in raising a young family that began during orientation week of intern year. Thank you to my patients for keeping me intellectually curious and passionate about improving the health of our community.

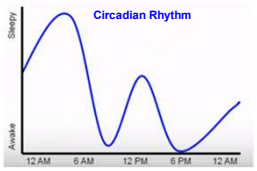


'Sleep like a baby'
From *Chaos* to **Stability**

Parent Child Elective
12/18/17
Paul Stevens, MD

What drives sleep?





- Reset by light exposure
- **Jetlag** concept
  - Early light means earlier waking
  - Later light means later bedtime

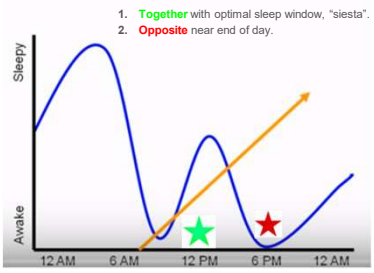
(Erin Evans PhD, 2012)

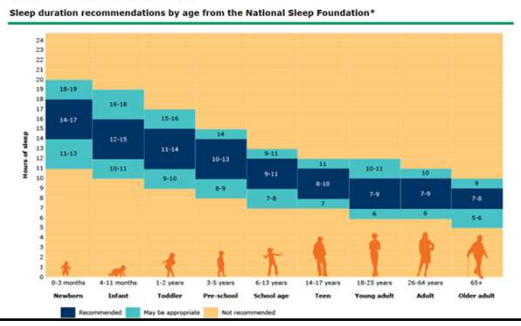
Objectives: Infant Sleep Science

1. Discuss the science of sleep and the physiology of circadian rhythm.
2. Discuss sleep architecture with NREM and REM sleep.
3. Define infant sleep and nap recommendations.
4. Discuss infant sleep behavioral interventions for common sleep problems.
5. Learn how to counsel patients and families on sleep.

Dueling sleep drives:

1. **Together** with optimal sleep window, "siesta".
2. **Opposite** near end of day.





Sleep patterns of 493 Swiss children tracked from birth
(Iglowstein et al. 2003 *Pediatrics*)

Age	Average total sleep time (hours)	Average night sleep (hours)	Average day sleep (hours)	50% of babies got between	96% of babies got between
1 month	14-15	8	6-7	13 - 16	9 - 19
3 months	14-15	10	4-5	13 - 16	10 - 19
6 months	14.2	11	3.4	13 - 15.5	10.4 - 18.1
9 months	13.9	11.2	2.8	12.8 - 15	10.5 - 17.4
12 months	13.9	11.7	2.4	13 - 14.8	11.4 - 16.5
18 months	13.6	11.6	2	12.7 - 14.5	11.1 - 16
24 months	13.2	11.5	1.8	12.3 - 14	10.8 - 15.6

The Basics:

0-3 mo **nap q2h**

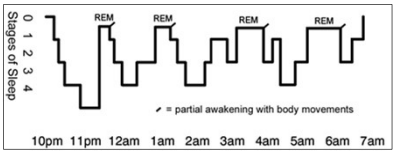
6-9 mo **3 naps**

9-12 mo **2 naps**

12 mo **1 nap**

Sleep Architecture: Non-REM and REM Sleep Cycle

- **NREM** (4 → 3 stages of "quiet sleep") + **REM** "active sleep"
  - Sleep Cycle = NREM followed by REM, 90-120 min, 3-4x/night
  - Children have much more N3 than adults; elderly may have little to no N3
  - Social skills, learning, memory
  - REM for motor skills development

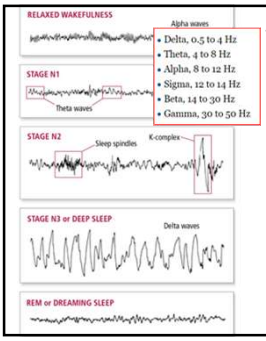


Hypnogram: Sleep stages during one night (after Dement & Kleitman, 1957)

Infant Sleep Architecture:

- First ⅓ of night,"deep sleep", large brain waves, high arousal threshold (alarm)
- After first ⅓ of night, "light sleep" (N2), synch neurons, low arousal threshold (floorboard)
- Adult REM: sleep paralysis except eyes
- Infant REM (<1 year): **no REM paralysis** (i.e. laugh, cry, suck)
- Importance of sleep cycle duration, **50-60 min** (i.e. couch analogy)

(Erin Evans PhD, 2012)



EEG & Sleep Cycle:

N1: Hypnagogic jerks "micro-awakenings" aware of sounds but unwilling to respond. **5% total sleep**

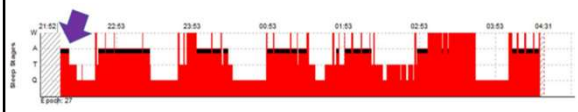
N2: "Unequivocal sleep", decreased muscle activity. Sleep spindles (sigma waves), K-complexes (-+-). Protects sleep and suppresses response to outside stimuli. Sleep-based memory consolidation and information processing. **50% of total sleep.**

N3: "Deep sleep" with Delta waves or SWS (slow-wave sleep). Even less responsive. Longer periods during first half of night in first 2 cycles. **20% of total sleep.**

(N4): When delta waves > 50% of total. **Dreaming** (parasomnias) in N3 (i.e. night terror, sleepwalking, sleeptalking, bed-wetting). Information processing and memory consolidation.

Groggy in N3 "sleep inertia" - 30 minutes to recovery.

Hypnogram: REM sleep onset in an infant

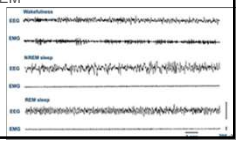


- Artifact from restless sleep, obscure sleep scoring
- W: wakefulness, only 10% total time
- A: active **REM** (black bars)
  - Sleep onset are more often REM until 3 mo
  - More than ½ total sleep is REM until 3 mo
- T: transitional sleep
- Q: quiet sleep **NREM**

(Damberger, 2016)

Rapid eye movements (REM): "Paradoxical sleep"

- 25% of total adult sleep, decreases with age
  - **Newborn** up to **80%** total sleep in REM
  - Dominates latter half of sleep (hours before waking), REM component per cycle increases ON
- Electrooculography (EOG)
  - Intermittent, phasic eye movements related to visual images of dreaming
- **EEG**: Theta, Beta, Alpha waves
  - Similar to waking, "saw-tooth" pattern
    - Increased brain O2 consumption, RR
- **EMG**: Muscle relaxation in NREM → **Atonia** in REM
  - Muscle inhibition via **NE** (locus coeruleus in pons)
  - REM sleep activated by **ACh**
  - REM sleep inhibited by **5-HT** (pons)



Importance of REM sleep:

- **Lack** of REM sleep has surprisingly few negative effects on behavior
  - Impair ability to learn complex tasks
  - Vital in early childhood development, highly active in long-term memory and emotion
- If REM is **interrupted or shortened:**
  - Longer REM in "rebound sleep", skipping to REM next opportunity
  - "Micro-awakenings" (sec) in REM, more likely to awaken
  - REM deprivation - compensate by dreaming more in NREM
  - Many meds interfere with NREM and/or REM

Which of the following medications **interfere** with REM sleep?

A. SSRI
B. CNS stimulants
C. Diuretics
D. Clonidine
E. All of the above

Antidepressants, antipsychotics, mood stabilizers

Frequent urination, HypoK → night leg cramps

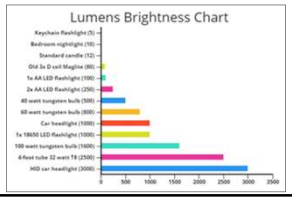
Stimulates alpha-2 R in brain, decreases presynaptic Ca++ which inhibits release of NE

Chronic marijuana - leads to long-term suppression of NREM stage 3 (deep sleep)

Blue light filters for insomnia:

f.lux

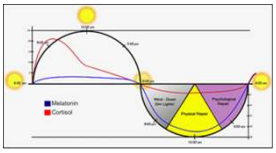
- Lumen measure all light that is given out (not intensity per sq in)
- Brightness intensity = **candela or "lux"**
  - Higher lux rating if light is more concentrated (accounts for area)
- **Lumen** = conventional wattage x 10

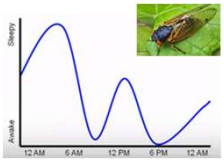


http://www.pisang-best-flashlight.com/archives/261

Importance of light and biological 'sleep clock'

- Decreased visual stimulation - promotes circadian entrainment
  - Study exposed sleeping individuals to 0.24 sec light spread over an hour
    - Shifted timing of circadian clock (delayed salivary melatonin) without alterations to sleep





(Zeitzner et al., 2014)

Photoreceptors: Rods & Cones

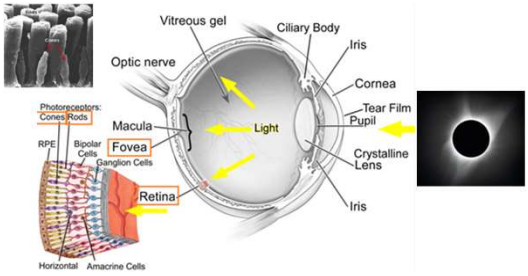
Cones - 6 million, color sensitivity, central macula (fovea centralis)
- **Red 64%, Green 32%, Blue 2%** (unique location)

Rods - 120 million, more sensitive, sees B&W and night vision, located everywhere else

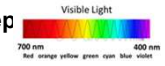
Color blindness - up to 250 million people, Northern Europeans (8% males UK, 4.5% total UK)
- Often X-linked vs acquired (DM / MS / eye dz)
- Faulty cones and/or faulty pathways

http://hyperphysics.phy-astr.gsu.edu/hbase/vision/rodcone.html

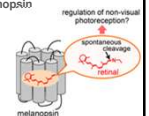
Eye structure and function:



Background: Blue Light Affects Sleep



- Night-time exposure to **blue** light increases alertness and affects circadian timing
- 1998 - **melanopsin** (3rd photopigment in eye after rhodopsin/photopsin)
  - Different from "rods and cones" photoreceptors that provide visual capabilities
  - Intrinsically photosensitive retinal ganglion cells (ipRGC) containing **melanopsin**
    - Sensitive to wide range of "**blue-green**" frequencies around 480nm
- Different age effects
  - Teens may be 2x sensitive to light at night, much less so in elderly
- Retinal Hazard
  - Screens actually less retinal risk than sky (>50x brighter)
- Color effect on brain
  - Low color temperature light (red) creates smooth lowering of CNS activity (bedroom color)
    - Better sleep environment



https://justgetflux.com/research.html

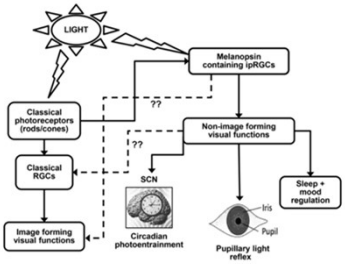
Melanopsin: "Phase-Shift and Entrainment" Pathway

- Found in ipRGC - signal to **block** melatonin production
- Sensitive to short wavelength **blue** light
  - Brain suprachiasmatic nucleus (SCN), retinohypothalmic tract (RHT)
  - AKA mammalian central "body clock"
- Interpret **non-imaging-forming** role in setting Circadian rhythm
- Mutations (Opn4) lead to 5% of all **SAD**
- Not exclusive - **0.5% cones also express melanopsin** in peripheral retina
- Mice without rods/cones still entrain; blind humans as well (enucleate)
- Only lack night/day entrainment if absent all 3 photoreceptors

Sleep Environment Basics:

1. **Cool** (body temp drops while sleep)
2. **Dark** (less visual stimuli promote circadian entrainment)
3. **Quiet** (continuous white noise)
4. **Humidity** (cough, esp during winter)

Regulation of Image and Non-Image Forming Visual Functions of the Eye



(Tsukamoto, et al. 2015)

http://photobiology.info/Sengupta.html

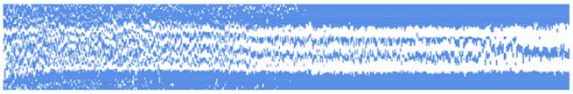
Importance of the Routine:

1. Consistent bedtime and wake time.
2. Regular timing for both biologic and psychological consistency.
3. Bedtime routine
   a. Avoid stimulating activity
   b. Feed/diaper
   c. Put child to bed awake for "**Positive Sleep Association**"

Eliminate Sleep Associations via Sleep Environment and Routine > Schedule

Common Sleep Association Problem #1: **Feeding to Sleep**

- Determine how much need to eat at night, night wean as needed
- Implement non-feeding caregiver "daddy time"
- Keep a sleep plot
- Regression before improvement



Behavioral Interventions:

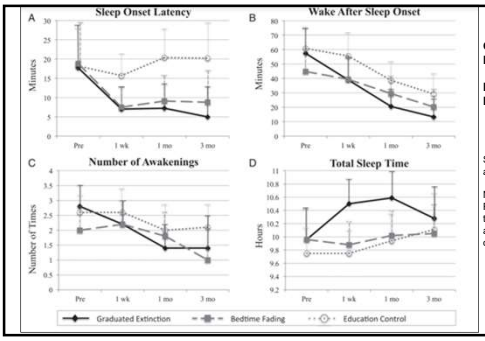
1. **"Ferber Method"** - Progressive Waiting, Timed Elimination, Controlled Crying (Ferber, 2006).
   a. Teach independent sleep by checking in at predetermined intervals of time
2. **"Simple Rules"**
   a. Leave baby in crib (but able to comfort any other way)
3. **"Cry it Out" or "Extinction"** - Weissbluth
   a. Do not go into the room
4. **"Interactive Intervention"** - a la Simple Rules
   a. Baby must put themselves to sleep IN crib, if cry can pick up, but always put down awake
5. **"Gradual Adjustment/Desensitization"** (Gradisar, et al. 2016)
   a. Gradual changes (i.e. move further away), put baby down slightly more awake each night.
6. **"No Cry"**
   a. Gradual process, opposite of extinction

No long-lasting effects (+/-). Reduce medium-term burden of infant sleep problems and maternal depression. (Price, et al. 2012) (Meltzer & Mindell, 2014)

Common Sleep Problems:

1. **Biology:**
   a. Bedtime too late
      i. Dim lights at target bedtime, put down child 20-30 min earlier / night.
   b. Wake too early
      i. Keep out AM light (black-out curtains)
   c. Inadequate naps (1 hour nap rule if not sleeping)

1. **Psychological** (i.e. devices, cat naps, nap maturity at 5 mo)
   a. Co-sleeping
   b. Poor sleep associations that lead to frequent awakenings
   c. Physically getting out of bed



Graduated Extinction

Bedtime Fading

Sleep benefits above control.

No adverse stress Responses or long-term effects on attachment, emotions or behavior.

(Gradisar et al., 2016)

Problem: Frequent Night Awakenings

Natural awakenings every 60-90 minutes (sleep cycle)

Sleep associations and need help to return to sleep each wake up

Negative sleep association

- Bee sting
- Fall out of bed
- Fire alarm

Other Causes: caffeine/med in milk, cat naps, teething pain, AOM/reflux/eczema, too long in bed, snoring (sleep disorders), PPD, family instability

Regular Nap and Nap Routine:

- Important to establish regularity and routine to cue for nap
- Distribution and balance
- Infant naps, look for nap possibilities every 2 hours
- Naps prevent behavior problems
- Eliminate unintentional naps (i.e. car rides)

- Miller, *et al.* 2015 showed regular naps in toddlers:
  - More likely to ask adults for help when facing challenges
  - Children without nap tantrum and get easily frustrated

- Attempt to preserve nap after age 3

Resources:

1. Dubief, A. (2017). *The Complete Baby Sleep Guide for Modern Parents: Precious Little Sleep*. Lexington: Lomahara Press.
2. Erin Evans PhD. "The Science of Infant and Toddler Sleep." Online video clip. Youtube. Youtube, 25 May 2012. Web. 15 Dec. 2017.
3. Ferber, R. (2006). *Solve Your Child's Sleep Problems*. 2nd Edition. New York: Fireside Book.
4. Gradisar M, et al. "Behavioral Interventions for Infant Sleep Problems: A Randomized Controlled Trial." *Pediatrics* 2016; 137(6).
5. **Grigg-Damberger MM. "The Visual Scoring of Sleep in Infants 0 to 2 Months of Age. 2016. *Journal of Clinical Sleep Medicine*; 12(3).**
6. Igbowstein I, Jenni OG, Molinari L, Largo RH. Sleep duration from infancy to adolescence: Reference values and generational trends. *Pediatrics* 2003; 111(2): 302-307.
7. Meltzer LJ, Mindell JA. "Systematic Review and Meta-Analysis of Behavioral Interventions for Pediatric Insomnia." *Journal of Pediatric Psychology* 2014; 39(8), 932-948.
8. Mindell JA, et al. "Behavioral Treatment of Bedtime Problems and Night Wakings in Infants and Young Children." ASSM *Sleep* 2006; 29(10).
9. Miller AL, Seifer R, Crossin R, Lebourgeois MK. "Toddler's self-regulation strategies in a challenge context are nap-dependent." *J Sleep Res.* 2015; 24(3):279-87.
10. Morgenthaler TI, et al. "Practice Parameters for Behavioral Treatment of Bedtime Problems and Night Wakings in Infants and Young Children." ASSM *Sleep* 2006; 29(10).
11. **Nunez PL and Srinivasan R. "Electroencephalogram." 2007. *Scholarpedia*. 2(2):1348. Website. Accessed 16 Dec 2017.** http://www.scholarpedia.org/article/Neurobiology_of_sleep_and_wakefulness
12. Price A, et al. "Five-Year Follow-up of Harms and Benefits of Behavioral Infant Sleep Intervention: Randomized Trial." *Pediatrics* 2012; 130(4).
13. Tsukamoto H, et al. "Retinal Attachment Instability Is Diversified among Mammalian Melanopsins." *Journal of Biological Chemistry* 2015; 290: 27176-27187.
14. Weissbluth, M. (2003). *Healthy Sleep Habits, Happy Child*. 3rd Edition. New York: Ballantine Books.
15. **Zeitzer JM, et al. "Millisecond Flashes of Light Phase Delay the Human Circadian Clock during Sleep." 2014. *Journal of Biological Rhythms*. 29(5).**

Lauren Walsh, MD

A lifelong Wisconsin resident, Lauren grew up on a farm in southern Wisconsin. After earning her bachelor's degree in Dairy Science at the University of Wisconsin-Madison, Lauren went on to complete her MD and MPH degrees at the University of Wisconsin School of Medicine and Public Health. Lauren loves family medicine for the scope of practice and the gift of greater insight into each patient's health as a result of caring for their entire family and community. She is looking forward to mentoring new residents and spreading her love for family medicine in her future career as a faculty member of a new rural family medicine residency in Elkhorn, WI. In her spare time, Lauren enjoys hanging out with her family and friends, baking, traveling, playing volleyball, and trying new foods on her unending restaurant bucket list.

Projects Completed During Residency:

Scholarly Project:

In a Woman with a Late-Term Pregnancy, When is the Best Time to Induce?

Community Health Learning Experience:

Badger Partners in Health and Safety - On Farm Health Screenings:

The Badger Partners in Health and Safety is a multi-disciplinary project that aims to work within the agricultural farming community to improve disparities by providing on-farm healthcare screenings and vaccinations to farm workers. For this project, my goal was to develop a protocol for referrals based on health screening results. To do this, I contacted the Rural Health Initiative, an organization based in Shawano, WI, that also provides on farm screenings, as well as preventative health visits for farm employees and have been doing so for 14 years. During this process, it was determined that UW Health would not be able to commit to providing follow-up and the health screenings were adjusted so that a referral process was not required.

THANK YOU to my patients, who were my teachers and allowed me to be part of their lives, during both hardship and joy. Their stories and faces are what I will always carry with me and remember. I would also like to thank my fellow residents for, "getting it," and being side-by-side on our adventure they called residency. You guys are the best. Thank you to our residency faculty and staff for their patience, hard work, and flexibility. Finally, I would like to thank my family and friends for their unending support, encouragement, delicious meals, and many loads of clean laundry, and keeping track of my ever-changing schedules so they knew when not to call me during the day. Mom and dad, job well done! You've taught me well. Last, but never least - I will be forever grateful to Saoirse, for always being excited and giddy to see mom at the end of a long day and to Robby for being my partner for life, my best friend, and for day-changing hugs everyday. Love.

In a woman with a late-term pregnancy, when is the best time to induce?

CASE

A 26-year-old G1P0 at 40 3/7 weeks comes in for routine prenatal care. She has had an uncomplicated pregnancy and desires a low-intervention unmedicated birth. She has become more uncomfortable lately, however, and asks for your guidance regarding at what point induction of labor is indicated.

Bottom line

In a woman with late-term pregnancy, induction of labor at 41 weeks results in a reduction in perinatal mortality and a reduced risk of Cesarean delivery compared with expectant management. The absolute risk of these outcomes is small, and women who prefer to avoid induction may be managed expectantly with twice-weekly antenatal testing to assess fetal well-being. Perinatal mortality continues to rise with increasing gestational age. The American College of Obstetricians and Gynecologists (ACOG) recommends induction of labor by 43 weeks.

Review of the evidence

Late-term pregnancy is defined as pregnancy between 41 0/7 and 41 6/7 weeks' gestation. Postterm pregnancy is defined as a pregnancy that reaches 42 weeks of gestation or longer. Observational studies have shown that perinatal mortality (stillbirth or death within the first week of life) increases with each week that a pregnancy lasts beyond the estimated due date. Fetal mortality increases weekly after 40 weeks' gestation: the odds ratio (OR) at 41 weeks is 1.48 (95% CI, 1.13–1.95), at 42 weeks is 1.77 (95% CI, 1.22–2.56), and at 43 weeks is 2.90 (95% CI, 1.27–6.61).[1]

A 2012 systematic review investigated labor induction at a predetermined gestational age versus expectant management in low-risk pregnant women at or beyond term (37 weeks).[2] This analysis of 22 RCTs (N=9,383) included 5 trials in which labor was induced at less than 41 weeks and 17 trials in which labor was induced at 41 or more weeks. In 20 of the trials, the expectant management protocol included some type of fetal monitoring (fetal heart rate monitoring and/or assessment of amniotic fluid).

Induction of labor compared with expectant management was associated with fewer all-cause perinatal deaths (risk ratio [RR] 0.31; 95% CI, 0.12–0.88). The number needed to treat to prevent 1 perinatal death was 410 pregnancies (95% CI, 322–1,492). A policy of induction of labor was also associated with a decreased risk of meconium aspiration syndrome (RR 0.59; 95% CI, 0.34–0.73), fewer Cesarean deliveries (RR 0.89; 95% CI, 0.81–0.97), more operative vaginal births (RR 1.10; 95% CI, 1.00–1.21), and a reduced rate of macrosomia (birth weight >4,000 g) (RR 0.73; 95% CI, 0.64–0.84). No significant difference was noted in newborn intensive care unit (NICU) admissions or Apgar score less than 7 at 5 minutes.[2]

A 2003 systematic review with meta-analysis assessed 16 RCTs (N=6,588) comparing induction of labor with expectant management for uncomplicated, singleton, live pregnancies of at least 41 weeks' gestation.[3] Thirteen of the RCTs in this systematic review were among the 22 RCTs included in the systematic review described above. Researchers concluded that women who underwent induction of labor had lower rates of Cesarean delivery (OR 0.88; 95% CI, 0.78–0.99). No significant difference was noted in the perinatal mortality rate (0.09% vs 0.33%; OR 0.41; 95% CI, 0.14–1.18), NICU admissions (OR 0.92; 95% CI, 0.78–1.10), meconium aspiration syndrome (OR 0.46; 95% CI. 0.18–1.21), or abnormal Apgar scores (OR 0.82; 95% CI, 0.51–1.32).

Recommendations from others

A 2014 ACOG practice bulletin recommended induction of labor after 42 0/7 weeks and by 42 6/7 weeks of gestation because of evidence of increased perinatal morbidity and mortality.[4] They further stated that induction of labor between 41 0/7 and 42 0/7 weeks "can be considered." Cervical ripeness was not incorporated in these recommendations. They suggested starting antepartum fetal surveillance at 41 0/7 weeks.

CONTINUED ON PAGE 14

LR+ 0.21, 95% CI, 0.10–0.46) while a SACS score >15 moderately increases the likelihood of OSA (AHI >10, LR+ 5.17, 95% CI, 2.54–10.51; AHI >20, LR+ 3.74, 95% CI, 2.20–6.37).[2]

A 2016 prospective cohort study of patients with clinical suspicion for OSA referred for sleep study reexamined the accuracy of the SACS to diagnose OSA (N=191).[3] A SACS score >15 was moderately predictive of OSA diagnosed by polysomnography with AHI >10 (LR+ 4.03; 95% CI, 2.16–7.56). A SACS score <5 was slightly predictive of the absence of OSA (LR+ 0.46; 95% CI, 0.31–0.7).

A 2014 Korean cross-sectional study examined 383 middle-aged patients (72% male), referred for a sleep study based on clinical suspicion, to assess physical examination signs associated with OSA.[4] Examiners assessed BMI, neck circumference, and waist circumference in all patients. OSA, defined by AHI ≥5, was diagnosed in 316 patients.

After adjusting for age, sex, alcohol consumption, and smoking, the researchers found BMI, waist circumference, and neck circumference were moderately associated with OSA in men (LR+ was 4.88 for BMI; 1.91 for waist circumference; and 4.54 for neck circumference). Adjusted associations in women were similar (LR+ was 3.33 for BMI; 2.25 for waist circumference; and 2.86 for neck circumference).[4] EBP

Paula Mackrides, DO
Ben Panbehi, MD
Jennifer Shaw, MD
Greg Havermale, DO
Aurora Bell, DO
SIU Quincy FMRP
Quincy, IL

1. Myers K, Mrkobrada M, Simel D. Does this patient have obstructive sleep apnea? The Rational Clinical Examination systematic review. *JAMA*. 2013; 310(7):731–741. **[STEP 1]**
2. Flemons WW, Whitelaw WA, Brant R, Remmers J. Likelihood ratios for a sleep apnea clinical prediction rule. *Am J Respir Crit Care Med*. 1994; 150(5 pt 1):1279–1285. **[STEP 2]**
3. Grover M, Mookadam M, Chang Y, Parish J. Validating the diagnostic accuracy of the Sleep Apnea Clinical Score for use in primary care populations. *Mayo Clin Proc*. 2016; 91(4):469–476. **[STEP 2]**
4. Kang HH, Kang JY, Ha JH, Lee J, Kim SK, Moon HS, et al. The associations between anthropometric indices and obstructive sleep apnea in a Korean population. *PloS One*. 2014; 9(12):e114463. **[STEP 2]**

CONTINUED FROM PAGE 5

TOPICS IN MATERNITY CARE

CASE WRAP-UP

You counsel your patient regarding the small, but statistically significant increased risk of fetal mortality with each week beyond 40 weeks' gestation. When presented with the option of induction of labor at 41 weeks or expectant management with twice-weekly nonstress test and amniotic fluid index monitoring, she chooses induction of labor at 41 weeks. EBP

Lauren H. Walsh, MD, MPH
Jennifer Lochner, MD
University of Wisconsin
Madison, WI

REFERENCES

1. Divon MY, Haglund B, Nisell H, Otterblad PO, Westgren M. Fetal and neonatal mortality in the postterm pregnancy: the impact of gestational age and fetal growth restriction. *Am J Obstet Gynecol*. 1998; 178(4):726–731. **[STEP 3]**
2. Guelmezoglu AM, Crowther CA, Middleton P, Heatley E. Induction of labour for improving birth outcomes for women at or beyond term. *Cochrane Database Syst Rev*. 2012; (6):CD004945. **[STEP 1]**
3. Sanchez-Ramos L, Olivier F, Delke I, Kaunitz AM. Labor induction versus expectant management for postterm pregnancies: a systematic review with meta-analysis. *Obstet Gynecol*. 2003; 101(6):1312–1318. **[STEP 1]**
4. American College of Obstetricians and Gynecologists. Practice bulletin no.146: management of late-term and postterm pregnancies. *Obstet Gynecol*. 2014; 124(2 pt 1):390–396. **[STEP 5]**

GLOSSARY

ARR=absolute risk reduction
CDC=Centers for Disease Control and Prevention
CI=confidence interval
CT=computed tomography
FDA=US Food and Drug Administration
HR=hazard ratio
LOE=level of evidence
MRI=magnetic resonance imaging
NNH=number needed to harm
NNT=number needed to treat
NSAID=nonsteroidal anti-inflammatory drug
OR=odds ratio
RCT=randomized controlled trial
RR=relative risk
SOR=strength of recommendation
SSRI=selective serotonin reuptake inhibitor
WHO=World Health Organization