INTRODUCTION

- The landscape of American health insurance is in flux. Purchasing plans can be confusing due to the unique language and multiple levels of healthcare delivery in the United States.
- As options expand, consumers face mounting pressure to make decisions relying on accurate interpretation of complex insurance jargon and costs-benefit analyses. Lower health literacy is associated with distrust and overreliance on certain providers, as well as higher costs.
- College undergraduates represent a unique window into a population soon to enter the insurance market. Many will age out of parental coverage as others obtain insurance through employment.

PURPOSE

- Assess pre-existing knowledge of health insurance
- Engage undergraduate students in a basic introduction to health insurance vernacular and systems to enhance health literacy
- Determine if an intervention focused on popular insurance models changes student confidence to make decisions about health insurance

METHODS

- Pre- and post-presentation surveys gauge student responses on a 10-point scale to measure interest and confidence managing various health insurance-related tasks.
- Questions emphasize baseline health literacy and student ability to evaluate and discuss fundamental aspects of healthcare.
- Select questions identical on both surveys to follow changes in insurance knowledge as a measure of health literacy.

RESULTS

Demographic data:
- 92% of students reported receiving health insurance through parental coverage
- All students rated interest in pursuing a healthcare-related career as 9/10 or 10/10 (26% and 74%, respectively)

KEY

10-point scale: ascending (1 = lowest; 10 = highest)
Q1: Interest in understanding American health insurance
Q2: Confidence in comparing costs & evaluating health insurance plans
Q3: Comfort in purchasing an insurance plan for yourself and/or your family
Q4: Confidence in comprehending health insurance terminology when talking with a healthcare professional
Q5: Likelihood to review information or seek additional resources about insurance in the future before selecting a health plan

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Q4: Confidence in comprehending health insurance terminology when talking with a healthcare professional
Q5: Likelihood to review information or seek additional resources about insurance in the future before selecting a health plan

CONCLUSIONS

- Although students largely reported minimal previous experience with health insurance, the majority expressed a desire to possess the ability to discuss its important facets.
- Student interest in understanding health insurance and the chance they would review additional resources before choosing an insurance plan later were high at baseline, further suggesting students already have the desire, though perhaps not the knowledge of how, to seek this information.
- The intervention produced the greatest impact on the more literal aspects of working with health insurance: students’ perceived ability to make decisions when evaluating different plans and discussing them with others. Augmenting these capacities are potentially most helpful when a fundamental knowledge is most critical, such as when purchasing a plan or reviewing claims with an insurance agent.
- Students reporting lower scores on the pre-survey responses produced the largest jumps compared to post-survey data.
- Question 4 response clusters indicate many students before the presentation were not fully comfortable discussing health insurance with a healthcare provider, which may impact their input on care and its implicated costs.
- Future investigations: sample students not already highly interested in pursuing healthcare-related careers to determine to what extent it affects prior interest or desire to learn.

REFERENCES

**INTRODUCTION**

Osteoarthritis (OA) is the most common joint disorder in the United States, affecting approximately 27 million Americans (1). OA most commonly occurs in the knee, for one in two adults will develop symptoms of knee OA sometime in their lives (1). Specifically, OA of the knee is due to a decreased viscosity of synovial fluid in the joint, which normally acts as a cushion. A healthy knee joint is lubricated with 1-2 mL of synovial fluid that contains 5 to 8 mg of hyaluronic acid (HA) (2). In the arthritic knee HA is diminished, reducing the viscoelastic properties of the joint and increasing the stress on the articular surface, which causes erosion, bone spurs, and pain (2).

**PURPOSE**

Mild knee OA is managed with intra-articular Supartz FX despite controversial results of randomized controlled trials against placebo. US prescribing information suggests Supartz FX may provide benefit after three injections, and this study analyzes Likert-type Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores following three injections given once weekly.

**METHODS**

32 patients with a mean age of 66±14 years receiving intra-articular Supartz FX were reviewed in a prospective, observational study. Functional outcome data via WOMAC scores for pain, stiffness and physical function were collected at weeks 0, 1, 2 and 3 while concurrently undergoing Supartz FX therapy. Weekly percent improvements were statistically analyzed for effect size at a 95% confidence interval and compared to minimum clinically important improvement (MCII) thresholds for each WOMAC sub score and total score (3).

**RESULTS**

![Fig 1. Effectiveness of Supartz FX injections into the knees of patients with osteoarthritis over a 3-week period. 32 patients with a mean age of 66±14 years received intra-articular injections of Supartz FX once weekly for three consecutive weeks. Mean reduction ± standard error (SE) and % improvement in WOMAC scores for pain, stiffness and physical function were assessed at weekly from week 0-week 3 while concurrently undergoing Supartz FX therapy. p<0.05, n=32.](image)

![Fig 2. Mean reduction in WOMAC function scores ± SE following Supartz FX injections into the knees of obese (BMI>30.00 kg/m²) patients. Physical function sub scores were compared at week 0 and at week 3 using a stratified BMI scale. Scores do not correlate completely with BMI. n = 23.](image)

![Fig 3. Confidence intervals of treatment effects for WOMAC sub scores are compared to published MCII thresholds for pain (0.39), stiffness (0.39), function (0.37) and total outcomes (0.40) (3). The MCII reflects the smallest clinical change that is considered important to patients. A “clinically significant finding” is one that is statistically significant and the lower confidence limit > MCII. The dashed lines represent the MCII for each corresponding sub score. Intervals are not drawn to scale.](image)

**CONCLUSIONS**

Three repeated injections of Supartz FX at one-week intervals resulted in modest percent improvement, most significantly seen across all sub scores after the second injection (Figure 1). These data suggest two injections of Supartz FX improve pain, stiffness, and physical function when given over three weeks (p<0.05). However, while mean score reductions suggest Supartz FX provides statistically significant benefit in patients when given at weekly intervals, confidence intervals of treatment effects for WOMAC sub scores fail to satisfy MCII thresholds for pain (0.39), stiffness (0.39), function (0.37) and total outcomes (0.40), meaning the changes are in fact not clinically significant (Figure 3).

The implication for use of non-surgical modalities in the treatment of osteoarthritis extends beyond symptom relief. From a community perspective, these measures can lower healthcare costs and provide patients more accessible therapeutic options. In a rural setting within which a patient may only visit his or her family physician, non-surgical options are not only more convenient, but are backed by a trusting patient-physician relationship. Therefore, while this study did not find the injections clinically significant, it contributes to a preventative-medicine database that primary care providers can employ when discussing osteoarthritis with patients. Further, it may encourage community members to become engaged in their healthcare decision-making, by knowing whether certain options are feasible standards of care.

Thank you for support from Mark Jenson and the Dousman Clinic.

**REFERENCES**


An Explanation of the Methodology Used to Develop a Systematic Implementation Plan for "Stop the Bleed" in Wisconsin

Thomas Hove, MHA, MPO; Marshall Beckman, MD; Lewis Somberg, MD; Christopher Davis, MD, MPH
Comprehensive Injury Center & Department of Surgery, Division of Trauma & Critical Care
Medical College of Wisconsin, Milwaukee, WI

BACKGROUND:

Developed in response to the Sandy Hook Elementary shooting, "Stop the Bleed" is a national campaign teaching all citizens how to control life-threatening hemorrhage. Although various implementation plans for the "Stop the Bleed" campaign exist, none discuss the resources necessary to implement the campaign across a large population. In Wisconsin the campaign lacked the coordination necessary for it to be adopted state-wide, resulting in an inefficient effort for the limited number of its champions. The purpose of this report is to explain the methods used in determining the resource requirements and evaluation criteria for the development of a "Stop the Bleed" implementation plan in Wisconsin.

METHODS:

An Operational Design (OD) methodology was used to develop the implementation plan. This approach involved:

• Using publicly available demographic and census data to conduct a thorough gap analysis between the desired end-state of the national Stop the Bleed campaign and the current state of Stop the Bleed within Wisconsin
• Create measurable goals and objectives
• Develop a framework of multiple lines of effort which support unified actions, effects, conditions, and objectives among all stakeholders.

RESULTS & DISCUSSION:

Results:

<table>
<thead>
<tr>
<th>ESTIMATED POPULATIONS</th>
<th>RESOURCE REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INSTRUCTORS</td>
</tr>
<tr>
<td></td>
<td>Quantity</td>
</tr>
<tr>
<td>Over Age 9-years</td>
<td>4,959,926</td>
</tr>
<tr>
<td>Grades K-12</td>
<td>974,984</td>
</tr>
<tr>
<td>Law Enforcement &amp; Support</td>
<td>18,519</td>
</tr>
</tbody>
</table>

The table above shows the resource requirements to accomplish the following clearly defined goals:
(1) ZERO preventable deaths from hemorrhage;
(2) Approximately 4.9 million Wisconsin citizens aged 9 years and older are skilled in basic hemorrhage-control techniques;
(3) Approximately 329,614 bleeding control kits are distributed throughout primary school classrooms, public spaces, event spaces, ambulances, and in law enforcement vehicles.

The OD methodology also produced three lines of effort:
(1) Equipping and Educating (Center of Gravity)
(2) Partnering and Policy (Supporting Effort)
(3) Information Operations (Supporting Effort)

Discussion: The goals above can be obtained through a unity of effort across all stakeholders and have the potential to demonstrate a real public health impact by following a few initial recommendations:
• Train Law Enforcement (TCC-LEFR is preferred over STB);
• Train 21-34 year old males (i.e., minorities, hunters, CCW);
• Track preventable deaths vs number trained and kits distributed;
• Form partnerships to reduce barriers to access.

"Stop the Bleed" training should remain a decentralized, grass roots program led by local champions.

References:
Health Tutors: A Partnership for Bidirectional Learning
Carmen Cobb, Peter Cote, Krista Tuomela, Leann Arcori, Gabe De Vela, Sonia Mehta, Jaimee Hall, Cynthia Zarazua, Caitlin Kaeppler
Department of Pediatrics, Medical College of Wisconsin, Milwaukee WI

BACKGROUND
• Refugees have many trepidations regarding medical visits.
• We envision that medical trainees could contribute to familiarizing the refugee learners with our healthcare system and working with refugees will enhance skills of the medical trainees.
• Together, we are in the process of designing a 12-month health literacy curriculum.

OBJECTIVE
• Focus on forming a longitudinal partnership between Medical College of Wisconsin students and residents and an organization in our community, the International Learning Center Program (ILCP)
• Jointly design a health literacy curriculum tailored to the ILCP learners.

METHODS

Small focus groups
• Understand level of experience with healthcare
• Topic ideas

Simple quizzes
• Understand topics refugees wish to learn
• Knowledge retention

RESULTS

<table>
<thead>
<tr>
<th>Session name</th>
<th>Notes on pre/post-quiz</th>
<th>Refugee learner comments, “I learned today”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary vs Emergency Care</td>
<td>All respondents reported increased understanding on post-quiz.</td>
<td>Learned the term facial droop and stroke. Hospital/civic urgent care. Specialty doctor/family doctor/Walgreens/Walmart. Family doctor. ER, hospital, clinic, family doctor. primary care. When to go to hospital.</td>
</tr>
<tr>
<td>Health History and Symptoms</td>
<td>8/10 answered correctly on presurvey, potentially noting good understanding of topic.</td>
<td>Kinds of symptoms. Nausea. How to go to doctor, to say a symptom. how to have to drink a medicines. I learned medicines. I learned shots. how to go see to doctor. Infection, sore throat, fever. Talk to doctor, chest pain, dizzy, headache, vomiting, nausea, high blood pressure. Parts of body. Symptoms of disease. Body parts.</td>
</tr>
</tbody>
</table>

Children's Health

Dental Care
3/10 respondents reported increased knowledge of how to find dentist that takes their insurance.
Today we learned about how to find the dentist and how to floss. How to take care of teeth or mouth, how to call dentist. Healthy teeth. What a dentist is. flossing. Brush my teeth twice a day.

Mental Health
I understand more about mental health and [what] to do if I have a concern. My doctor check[ed] mental health. About suicide and mental health – if you have depression, talk to your doctor. I can talk to my doctor.

Routine Health Maintenance
I learned that cigarettes are bad. I want to know more about eating healthy. I learned no smoking. I learned blood draws, kidney, and stethoscope.

Sexual Health
Diabetes
3/4 reported increase in understanding                   No survey responses.

Cold vs Flu
5/7 learners reported improved knowledge on post-quiz. No survey responses.

Healthy Living
8/8 learners responded correctly to pre and post knowledge questions, possibly demonstrating good knowledge of topic.
I have learned soda and juice are not healthy for our body. Exercise. I understand how to prepare myself to be healthy. Healthy foods. Eat vegetables. Dairy.

DISCUSSION
• Learners reported increased knowledge on post-quiz in 4 sessions
• 2 sessions showed good baseline understanding
• Comments help clarify lessons learned in sessions
• Through post-quiz questions, we identified topics refugee learners want to know more about

CONCLUSION
• Our partnership can be a model for tailoring health literacy experience to a community’s requests and interests
• Medical trainees can be effective educators in the community
• Goal to further refine, simplify quizzes and adapt to English literacy
• Plan to continually adapt to refugee learner requests and introduce new topics accordingly
• Materials can be used for similar endeavors in other communities

Refugee learners want to know more about:
Efficacy of the GRIT Rubric for Educators
Erin Duffy, MS2

INTRODUCTION
• Lifetime prevalence of mental illness for 13-18 year olds is 49.5% (22.2% being severe)
• Trauma Sensitive School Requirements have recently been established to provide Grief Training, which has been associated with increased resilience in bereaved participants
• Duckworth defines grit as “perseverance and passion for long-term goals”
• Grit is a better predictor of success than IQ or GPA alone
• Students who have more grit have demonstrated better coping strategies

PURPOSE
• Provide a learning opportunity for educators to foster grit in the classroom and improve the chances for long-term success of students
• Have students self-assess grit levels before and after grit training for teachers

METHODS
• Updated the previously used GRIT (Generating Resilience through Integrative Teaching) rubric to allow for more objective grading of teachers
• Observed, interviewed and scored two Northeast WI Teachers using the GRIT rubric
• Provided constructive feedback to teachers after each training session
• Collected student self-assessment surveys of their level of “grittiness”

RESULTS
• Improvements seen in researcher assessed GRIT level of teacher – indicating the teacher has created a classroom environment more likely to instill grit in students

CONCLUSIONS
• Educators felt that the GRIT Rubric feedback was valuable in giving them ideas for promoting success in the classroom
• Educators encountered some difficulties when trying to appropriate time not only for lesson planning according to curriculum requirements, but also for incorporating newly learned grit concepts within those plans
• Student’s self-assessment survey grittiness levels correlated with improvement in their teacher’s GRIT rubric scores
• This study could be improved by including more teachers and students of more similar grade levels
• Further research may include instructional presentations for teachers on methods to instill grit within their students through their words, lesson plans, and classroom environment

REFERENCES
Cole Nygard, Julie George

Student Self-Assessment of Gritty Attitudes

Before Educational Training Sessions

After Educational Training Sessions

Students of Teacher 1

Students of Teacher 2

Researcher Assessed Teacher GRIT Scores

Session 1 Session 2 Session 3

Teacher 1 Teacher 2 Average of Teachers

Grit Score

Not Answered Least Gritty - 1 2 3 Most Gritty - 4

• Improvements seen in student self-reported grit levels – as demonstrated by increase in size of green bars
Assessing Parental Engagement in a School Nutrition Education Program

Megan Cory and David Nelson, PhD
Urban and Community Health Pathway, Medical College of Wisconsin

Abstract

“Doctors as Teachers” developed the program Food Doctors in which medical students provide nutritional education to socioeconomically underserved elementary students in Milwaukee. Food Doctors has partnered with two local elementary schools to deliver an established evidence-based nutrition education curriculum to their 3rd grade students. This program successfully teaches students about nutrition, but the practical impact on nutrition behaviors at home has not been studied. Research shows strong parental impact on their child’s nutritional habits and the importance of parental involvement in nutrition education programs. Therefore, the objective of this project was to assess parental awareness of Food Doctors, views on nutrition education, and nutritional behaviors as reported by parents and students who participated in Food Doctors. This aim was accomplished by surveying parents and student participants after completion of the Food Doctors program. Students completed a short survey asking if they told their parents about the program and their nutrition related behaviors at home. Parents were also asked to complete a survey assessing their awareness of the program, views of nutrition education, interest in receiving Food Doctors messages, and nutrition related behaviors at home. Additionally, parents received a lesson summary for reference. About half of parents reported awareness of Food Doctors, while 73% of students reported telling their parents about the program. Moreover, results showed discrepancies between the parents and student self-reported health behaviors. In conclusion, we will devise and discuss methods to best engage parents in health education programs based on their communication preferences and analysis of survey results.

Background

Providing parents with nutrition information has been shown to have multiple benefits including healthier meals being prepared at home, children eating healthier foods, and parents requesting healthy recipes [1]. Food Doctors teaches children how to make healthy eating choices, but parental support is needed in order for these decisions to be implemented [2]. Changing eating habits for the better is more effective when education is aimed at a family behavior versus individuals. This education is also helpful for improving parent eating patterns plus diet and disease prevention knowledge [3]. Due to this strong parental impact on children eating patterns, it is important to effectively engage parents and assess their interest in nutrition education, while taking into consideration sociocultural factors that impact eating patterns [4]. These studies indicate the strong parental impact on children eating habits and the importance of parental involvement in nutrition education for their children.

Survey results showed that parental awareness of Food Doctors differed by school. St. Marcus reported 60% of parents were told about the program compared to 33% at the Milwaukee Academy of Science (MAS) [Figure 3]. Importantly, the survey response rate from parents at St. Marcus was 80% (40/50), while the response rate from parents at MAS was 24% (18/74).

Awareness of Food Doctors in parents was also assessed by surveying students on whether they had told their parents about the program. Results show that the majority of students, at both St. Marcus and MAS, report telling their parents about the program. Both schools showed very similar percentages in ‘Yes’- around 70%, ‘No’- around 18%, and ‘I don’t remember’- around 9% [Figure 4].

Results

Survey results showed that parental awareness of Food Doctors differed by school. St. Marcus reported 60% of parents were told about the program compared to 33% at the Milwaukee Academy of Science (MAS) [Figure 3]. Importantly, the survey response rate from parents at St. Marcus was 80% (40/50), while the response rate from parents at MAS was 24% (18/74).

Students in both schools, both reported a majority response of ‘Most of the time’ or ‘Sometimes’ regarding statement 1. In regards to statement 2, St. Marcus students had a majority of 60% report ‘Sometimes’ compared to MAS. For statement 3, both schools had a majority of responses tending toward ‘Sometimes’ and ‘Never’ [Figure 7].

Conclusions & Future Directions

There may be discrepancies in parental awareness of Food Doctors depending on if we ask students or parents. It is also dependent on the established means of communication that our partner schools have already set up with their parents. Developing a reliable model for bidirectional communication with parents seems to be the first step in effective parental engagement. Most parents interested in receiving nutrition education materials prefer a handout or email. Unfortunately, our survey results were skewed by a low survey response rate from parents at MAS, likely due to bad weather during the time of administration.

Methods

After the final lesson, students were asked to complete a short survey that includes one question regarding parent communication about the program and a 3 question Likert scale to assess the student perspective on nutrition related behaviors at home [Figure 1]. At home, parents were asked to fill out a survey consisting of 3 questions assessing parent awareness of our program, views of nutrition education, interest in receiving Food Doctors materials, plus a 6 question Likert scale to assess nutrition behaviors at home [Figure 1]. We also provided the Food Doctors lesson summary for the families to keep as a reference [Figure 2]. All surveys were anonymous.

Student Survey – Likert Questions

1) We eat fresh fruits and/or vegetables almost every day.
2) We eat fruit almost every day.
3) We drink sodapop almost every day.

Parent Survey – Likert Questions

1) We eat fresh fruits and/or vegetables almost every day.
2) We do not buy healthy food because it is too expensive.
3) We eat fruit almost every day.
4) We drink sodapop almost every day.
5) I know the difference between healthy and unhealthy foods and drinks.
6) Learning about nutrition is important.

Results from the Likert questions regarding nutrition behaviors indicated that for each statement, parents from either school answered very similarly, with not much variability. Overall, parents agreed with statements 1, 5, 6 and disagreed with 2, 3, 4 [Figure 6].

References & Acknowledgements

Special thanks to Wasif Osmani and Kevin Cory for their help and support. The Food Doctors Team: Jacob Schreiner, Eric Bobel, Paul Otto, and Kelley Lamb. Many thanks to our community partners: Milwaukee Academy of Science and St. Marcus Lutheran School.

BACKGROUND

- ACGME states that “residents are expected to demonstrate sensitivity and responsiveness to a diverse patient population.”
- Between 2001-2015, 12,000 refugees from 50 different countries arrived in Wisconsin; 65% in Milwaukee County.
- There is a demonstrated community need for physicians to provide culturally sensitive, effective care to refugees in Milwaukee.

OBJECTIVE

- To understand trainees’ confidence in caring for refugees and address a gap in medical education

METHODS

- Curriculum Night Design:
  1. Power point presentation about the refugee resettlement process and medical aspects pertinent to refugee health
  2. Physician guest lecturer
  3. Panel discussion
- Survey Design:
  1. Questions adapted from the Cross Cultural Care Survey (Weissman, et al.)
  2. Four repeated questions pre and post survey in addition to background questions
  3. Paired data with self-generated identifier

RESULTS

- <5% of trainees report receiving adequate class time on refugee and immigrant specific medical issues
- 19% report they are usually confident in providing culturally sensitive care to refugees

Figure 1: "I feel comfortable providing medical care to patients who speak a language other than English"
Figure 2: "I am aware of the process of refugee resettlement in the United States"
Figure 3: "I am aware of the medical intake procedure refugees must undergo upon resettling in the United States"
Figure 4: "I feel confident in my ability of provide culturally sensitive care to refugees"

Wilcoxon signed-rank test showed increases in trainees’:
- Comfort providing medical care to non-English speaking patients (p=.023)
- Awareness of the process of refugee resettlement in the US (p=.025)
- Awareness of the medical intake procedure refugees undergo upon resettling in the US (p<.01)
- Confidence in providing culturally sensitive care to refugees (p<.01)

CONCLUSION

- Conventional medical education does not provide refugee focused health information
- Population specific curriculums like the one presented improve understanding and comfort
- Seminars can help to address barriers providers face in serving specific populations

DISCUSSION

- Small sample size with selection bias risk
- Adapted survey with limited validity
- Further research needed to evaluate scope of content

REFERENCES

Navigating Complexity in University-Community Partnerships

Eleanor Barr, Laura Hermanns, Dulmini Jayawardana
Master of Sustainable Peacebuilding, UW-Milwaukee

Introduction
This project examines the role of urban-serving university-community partnerships in addressing complex social problems. The findings are rooted in the experiences and research of the three authors, who use Milwaukee, Wisconsin, USA as a case-study. The landscape is complex for this type of work, with partners navigating the challenges of an institutional colonial legacy of white supremacy and exclusion, uneven power dynamics, organizational tensions, value clashes, competition for funding, mistrust among partners, and the pressured expectations of stakeholders. Many university-community partnerships are successful, creating tangible benefits for involved parties. Some are less successful and fall into vicious cycles which may perpetuate the exact social problems they seek to remedy. Most struggle to address the underlying root causes of social conditions due to inadequacies in complexity-aware program interventions and minimal attention to structural factors that can enhance overall system health.

Methods
- Literature Review
- Interviews
- System Map

Framing questions
- What factors enable or inhibit equitable university-community partnerships?
- In what ways do university-community partnerships perpetuate or challenge systems of inequality?

Context
Deindustrialization
Economic Flight
Suburbanization
Segregation
Urban Disinvestment
Institutional Barriers

Cycles of Mistrust
- Colonial Methods of Engagement
- Privileging of Academic Knowledge
- Expert-Client Relationship

Gap: Restrictive Funding Structures
- Restrictive Grant Cycles
- Competition and Turfism
- Funders set priorities

Lever: Improve Funding Processes
- Equitable evaluation practices and trust-based collaborative grant-making
- Build relationships with local and national funders and state agencies
- Increase support of BIPOC-led organizations

Gap: Cycles of Mistrust
- Colonial Methods of Engagement
- Privileging of Academic Knowledge
- Ivory Tower Mentality

Lever: Building Trust and Accountability
- Examine personal and institutional biases
- Elevate community participation and experiential knowledge
- Planning for shared governance and long-term engagement
- Focus on building social capital

Complexity Lens
- Addresses paradoxes and the duality of collaboration and conflict
- Engages with uncertainty and ambiguity
- Focus on relationships
- Balances top-down and bottom-up orientations
- Allows difference to exist in shared space. Multiple perspectives and lenses honored. Supports a less reactionary approach to problems. Typically does not lead to “band-aid” fixes.

Justice Lens
- Contrary to a charity mentality, where resources and surplus are “given” without acknowledgement of the context that allowed disproportionate wealth-accumulation to root.
- Mutual resources are shared among members of a community
- Supports reconciliation with hurt communities.
- Addresses cycles of mistrust and power imbalances.
- Broadens scope to incorporate the context of inequality

Conclusions
Supporting positive change in this system is best served by viewing partnerships through a complexity and justice lens. This mindset is essential for grappling with the historical legacy of higher education in the US, the realities of social inequalities, and the hard work required of relationship-building and partnership. Using this lens also points to the need for multifaceted interventions at multiple scales to leverage change across the system. Each university-community partnership is unique, but engaging in methods to shift power, move toward interdisciplinarity, improve communication, and understand funding structures can improve the over health of the partnership landscape.

Campus-Community Partnership Vicious Cycle
Institutional Distrust
Community-Resistence
Devaluing Community Knowledge
Disrupt Social Networks
Expert-Client Approach
Institutional Agendas Encroach on Community

Gap: Institutional Challenges
- Poor Communication
- Disciplinary Silos
- Tenure and publishing disincentives
- Workload

Lever: Support Interdisciplinarity and Communication
- Reward faculty for community-engaged scholarship
- Invest in inter-campus and inter-organizational communication
- Standards for community engagement across disciplines

Gap: Institutional Distrust
Institutional Decision-Making Power
Community Decision-Making Power
Disrupt Social Networks
Devaluing Community Knowledge
Expert-Client Approach
Institutional Agendas Encroach on Community

Lever: Anchor Transformation Model

Community Engagement Model
Collective Impact Model

Figure 1. Complexity Lens

Lever: Building Trust and Accountability
- Examine personal and institutional biases
- Elevate community participation and experiential knowledge
- Planning for shared governance and long-term engagement
- Focus on building social capital

Lever: Support Interdisciplinarity and Communication
- Reward faculty for community-engaged scholarship
- Invest in inter-campus and inter-organizational communication
- Standards for community engagement across disciplines

Lever: Anchor Transformation Model

Community Engagement Model
Collective Impact Model
School Based Mental Health Care Positively Impacts Academics for Children In Marginalized Communities

Why school-based mental health services?

- 20% of U.S. children have a mental illness and close to 2/3’s of these do not receive care for it. These numbers are worse for disadvantaged kids.
- Health disparities contribute to achievement gaps between middle-income and low-income children.
- Barriers to accessing mental health care are greater in marginalized communities: cost/insurance, scheduling, transportation, shortage of providers in the area.
- School-based mental health services reduce such barriers and level the playing field in terms of well-being and achievement.

Outcome Study:

We followed 349 children within the 22 partnership schools across academic years 2015-2016 and 2016-2017 and gathered data on their emotional functioning, attendance and disciplinary referrals, as well as academic outcomes. Within this number was a group of 131 children we used as a comparison (control) group; they were referred for SCPMH therapy, but parents did not give permission to start services at school. The breakdown:

Students in the Treatment Group did show improved mental health.

On the Strengths and Difficulties Questionnaire (SDQ), a decreased score indicates improvements in rated mental health and fewer mental health symptoms:

Students in the Treatment Group had a more positive trend in school-related behavior problems.

Students in the Treatment Group showed significant improvement in academic achievement.

Wisconsin uses the STAR Assessment test to evaluate the progress of students over the course of the year. Students were categorized into improvement or no improvement conditions based on STAR Assessment test results over the two year period:

- Students in the SCPMH Treatment Group were significantly more likely to show improvement on the STAR Math Assessment test than students in the SCPMH Control Group.
The United Community Center Hypertension Program: Blood Pressure Control in a Hispanic Community in Milwaukee

Mark Kaeppler, MD1; Claire Knaus4, Neil Shah, MD2; Matthew Weber4; Inez Fabian3; Margaret Pertzborn3; Tim Balke5; Al Castro5; David Gutterman, MD1,2

1. Division of Cardiology, Department of Medicine, 2 Cardiovascular Center, 3 School of Pharmacy, 4 School of Medicine, 5 United Community Center

Introduction

• Hypertension (HTN) is a major risk factor for myocardial infarction and stroke, as well as other disease states
• HTN occurs more frequently in underserved populations and commonly remains undiagnosed and/or undertreated, as it is usually asymptomatic
• Patients may not seek medical care for treatment of HTN

We tested the feasibility and compliance of a novel strategy for assessment of blood pressure (BP) within a Hispanic community in Milwaukee.

Methods

• 20 high school students were recruited through our community partnership
• Students were educated (by Cardiologists) about HTN and proper technique for measuring BP
• Each student was issued an automated BP cuff and were encouraged to measure BPs of willing participants
• Students were instructed to measure BPs at least 3 times for at least 3 individuals over a 3-month period
• 15 students completed these measurements

Results

- Students approached 46 individuals, and 100% agreed to participate
- Mean age of participants was 38 years: 30 were women; 16 were men
- Systolic BP (SBP) among participants was 118 ± 15 mm Hg, and diastolic BP was 77 ± 9 mm Hg
- 11% of participants (n=5) had a previous diagnosis of HTN
- 74% of participants (n=34) reported seeing a doctor within the past year
- 100% of students reported an improved understanding of HTN and voiced that participation in this program fostered interest in pursuing study or a career pertaining to healthcare delivery

Discussion

This pilot project demonstrates the feasibility and positive impact of this community-based program, which successfully recruited minority participants for BP screening and engendered knowledge and interest in medicine among high school students who are underrepresented in medical fields.

Thank You!

Thank you to Dr. Gutterman for institutional support from a grant through Northwestern Mutual, and also to the United Community Center, in order to complete this program.
PROTOCOL OF THE PREVENT ANAL CANCER STUDY OF SELF-SWABBING AND NOVEL BIOMARKERS

Christopher O. Ajala MD, MPH;1 Timothy J. Ridolfi MD;2 Sarah Lundeen RN, MSN, APNP;2 Elizabeth Y. Chiao MD, MPH;3 Maria E. Fernandez PhD;4 Vanessa Schick PhD;4 Anna R. Giuliano PhD;5 Eric L. Brown PhD;4 Michael Swartz PhD;4 Alan G. Nyitray PhD1

1Clinical Cancer Center and Center for AIDS Intervention Research, Medical College of Wisconsin, Milwaukee, Wisconsin; 2Department of Surgery, Division of Colorectal Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin; 3Department of Medicine – Infectious Disease, Baylor College of Medicine, Houston, Texas; 4The University of Texas Health Science Center at Houston School of Public Health, Houston, Texas; 5Moffitt Cancer Center and Research Institute, Tampa, Florida

BACKGROUND

- Anal cancer is a rare disease (2 cases/100,000 persons annually) caused by persistent human papillomavirus infection (HPV).
- However, among men who have sex with men (MSM), who are HIV-negative and MSM who are HIV-positive, the annual incidence is estimated at 35/100,000 and 137/100,000, respectively.
- There are no uniform anal cancer screening recommendations to identify persons at increased risk of anal cancer.
- Also, since men, in general, have poor compliance with preventive screening recommendations, it may be helpful to assess methods of screening, like self-swabbing, that could reduce barriers to screening protocols developed for men and transwomen.
- Evolving screening recommendations may involve molecular and/or cytological markers.

OBJECTIVES

- To test compliance with home-based versus clinic-based swabbing among 400 Milwaukee MSM and transwomen and to assess the utility of HPV persistence and host/viral DNA methylation as triage biomarkers.

METHODS

- MSM and transwomen will be recruited between 2019 and 2021 (n = 400).
- Participants will be aged 25 years or older and acknowledge sex with men
  - No prior diagnosis of anal cancer
  - No anal Pap test in the last 12 months and recall of the result
  - No plans to relocate in the next 12 months
- Anal canal exfoliated cell specimens will be obtained from participating persons by self-swab or by clinician swab at 0 and 12 months.
- Specimens will be assessed for 12-month persistent HPV infection and host/HPV DNA methylation.
- All participants will undergo high-resolution anoscopy (HRA).
- Demographic and experiential data will be collected from study participants using computer-assisted self-interviews (CASI) at several time points.

CONCLUSION

- Study findings may increase knowledge about anal cancer screening among MSM and contribute to reduced morbidity and mortality from anal cancer.

Please address questions to Christopher Ajala: cajala@mcw.edu
BACKGROUND

- Triple P stands for Positive Parenting Program
- Evidence-based program that provides strategies to address behavioral problems in children 0-12 years old
- Success in suburban communities of greater Milwaukee area
- Challenges implementing program in Milwaukee
- Lack of childcare possible contributing barrier
- Opportunity for pediatric residents to develop health curriculum for children

OBJECTIVE

- To provide age-appropriate health activities for children of Triple P participants

METHODS

- Identified a strong community partner COA Early Childhood Education Center
- Based curriculum and activities on Wisconsin Department of Instruction guidelines for health education
- Prioritized activities that “develop age-appropriate cognitive understanding of health promotion concepts to improve health behaviors”
- Activities for age 5-12
- 5 main health stations
- Healthy snacks provided
- Infant childcare provided by community partner staff

Alphabet Exercises

- Children invited to come up with physical exercises for each letter of the alphabet
- Helps to foster speech and language skills
- Allows children to engage in creative physical exercise

Glitter Germs

- Glitter used to signify germs
- Kids give each other high fives to show transfer of germs
- Wash away glitter “germs” to illustrate hand hygiene

Teddy Bear Clinic

- Developed in the 1980s to increase familiarity with medical concepts, tools, and common procedures
- Decreases children’s ratings of expected pain from medical stimuli
- Decreases reported distress and increases overall satisfaction with the medical team
- Topics included blood pressure, pulses, otoscope exams, and fracture splinting

Organ Identification

- Outline of a person with cutouts of various body organs
- Kids guessed organs and attached to correct anatomical position
- Discussed role and function of each organ
- Provides proper anatomical terms to enhance body image, self-confidence, and openness

MyPlate Nutrition

- Discussed MyPlate components: fruits, vegetables, grains, protein, and dairy
- Had kids sort different foods into the appropriate components on a large MyPlate template
- Allowed kids to color in their own MyPlate template with their favorite foods in the appropriate location

REFERENCES


REFERENCES

- 17 parents participated in the pilot Triple P program at COA Youth and Family Center
- 12 children participated in the health education program
- General reception positive from parent and children participants
- Parents and community partner have requested more sessions for the future
- Providing child care facilitated having a large turn out of parent participants
- There are creative opportunities for pediatric residents to provide health education outside of a clinical setting

CONCLUSIONS

- Further evaluation needed to determine other barriers to participation in Triple P

DISCUSSION

- Need to evaluate role of providing child care and health activities in decision to participate in Triple P

REFERENCES


REFERENCES
LENA Start Marathon County: A Community Project to Close Achievement Gaps Before They Start
Corina Norrbom MD, Amy Prunuske PhD, Nicole Tank

Background

Exposure to language during early childhood is important in brain development and can be used to predict future literacy skills and school success. Parents and caregivers are key in creating optimal early language learning environments. A local workforce shortage inspired community action and investment in parents and young children. LENA Start is a parent group model that utilizes LENA’s “talk pedometer” to support interventions that improve early language exposure.

Objectives

-Advance language development and early literacy skills in children before age 3

-Improve the quantity of talk and quality of parent-child interactions

-Promote parent engagement in the community and in early-childhood education programs

-Support employees as parents, thereby attracting and retaining productive workers locally

Methods

4 community partners emerged to implement LENA Start Marathon County. Grants and private donations were raised to fund an initial 2-year implementation. LENA Foundation conducted webinar and on-site training over the course of 3 months. Community partners and site partners meet weekly.

The LENA Start parent group model is utilized. Cohorts of parents attend weekly one-hour sessions for 13 weeks with trained facilitators. Each week families complete a day-long recording with their child. Adult word count, conversational turns, and electronic/TV sound is measured using LENA (Language Environment Analysis) technology. Reading minutes are self-reported. Parents receive a feedback report and learn evidence-based Talking Tips. They learn about a new strategy, observe the strategy, reflect on how they would use the strategy, practice and review. Sessions incorporate group learning as well as individual coaching. The program is free of charge and includes meals, childcare, and a free book each week. This protocol was approved by the MCW IRB PRO00029308.

Results

City of Wausau Total Population
Source: US Census Bureau, 2015

Participant Ethnicity

Graduations by site

Conclusions & Future Directions

Pilot year results are promising in terms of parent and child benefits and in the development of an expanding public-private community partnership to try to close achievement gaps by supporting parents and their young children through language. Further quantification of data will follow as the number of participant families increases.

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Introduction
Adolescents demonstrate a need for access to sexual health, mental health, and substance use counseling, but many report never having discussed these sensitive health topics with a healthcare provider. Healthcare providers are a reliable source of knowledge, but there is a critical gap in communication with adolescent patients. The PATCH (Providers and Teens Communicating for Health) Program aims to bridge communication gaps between adolescent patients and healthcare providers by facilitating open and honest conversations about sensitive health topics.

Methods
Figure 1: The PATCH Site Architecture illustrates the holistic and collaborative approach to program implementation.

Teen Educators, a diverse group of students from Central Wisconsin high schools, are hired to lead two types of workshops - one targeting peers and the other healthcare providers – to increase utilization of healthcare resources by young people and improve communication in the provider's office. PATCH is based on activities developed by the National Institute for Reproductive Health including skits, small and large group discussions, and worksheets. The curriculum was first implemented in Madison, WI, in 2010, and effectiveness was demonstrated in a 2015 publication. It was adapted and implemented in Central Wisconsin in 2018. Program activities and analysis are approved under MCW IRB # PRO00031805.

Results
PATCH Central Wisconsin implemented seven peer to peer and two provider workshops. After each workshop, evaluations were administered to all participants. A total of 74 providers participated in a workshop and 22 evaluations were returned for analysis. A total of 235 teens participated in a workshop and 94 evaluations were returned for analysis.

Conclusions
Teen participants demonstrated increased:
• Understanding of the importance of patient/provider communication
• Self-efficacy.
• Confidence in talking to providers about sensitive health topics.
Provider participants demonstrated increased:
• Knowledge of adolescent concerns and preferences
• Understanding of best-practices to ensure honest conversations about health history.
• Knowledge of minors' rights in Wisconsin.

References
Introduction

- There is increased awareness of the impact of concussion on students given the high prevalence and the potential for lifelong complications.
- Standard treatment has been avoidance of all mental stimulation, which recent literature suggest may cause harm.
- Experts have created Return to Learn (RTL) guidelines which provide guidance for students to return to the classroom after a concussion.
- Many educational online resources are available about RTL including CDC’s “Heads Up,” and “Get Schooled On Concussions.”
- Few schools are aware of these free resources.

Objective

To increase awareness about RTL in Wisconsin Public Schools to ensure the best possible post-concussion care for students.

Needs Assessment

- Local public schools from Children’s Hospital of Wisconsin’s direct catchment area participated in a phone survey for needs assessment:
  - Current concussion management
  - Interest in concussion resources
  - What specific information is needed

Intervention

- Reviewed many available RTL educational resources (Head’s Up, PACE, REAP, and Get Schooled on Concussion)
- RTL curriculum was developed using "Get Schooled On Concussions" as the primary resource.
- Curriculum summarized RTL recommendations in a single document that is easily distributable and readable.
- Curriculum emailed to 2,132 Wisconsin public schools, grades K-12.

Results

- Of the 2,132 schools which were sent RTL information, 67 responded (3.1% response rate)
- 66% of respondents reported that <10 students at their school(s) per year suffer from concussions
- 53% said concussions have a significant impact on learning in their classrooms
- 100% of schools surveyed were interested in receiving information about concussion management
- 100% of respondents found the information provide helpful
- 62.7% planned on implementing changes because of the document

Results (feedback)

- “Information would be helpful in particular when student involved is not an athlete”
- “Getting specific information on limitations for a set time period from the students’ doctor is the best way to prevent confusion with health care and school administration/coaches.”
- “I do think it would be helpful if there were more education statewide for providers to be directly communicating with schools about post concussion care and return to learn recommendations.”

Conclusions

- There is a need for concussion information in Wisconsin schools
- Email is not the preferred method of distributing information, given the low response rate
- When information is effectively given, schools are willing to make changes to improve concussion management in the classroom
- More work needs to be done to effectively distribute information to schools

References


Special thanks to Matt Kamer, M3 for his work in conducting the initial phone survey to CHW’s catchment schools.
INTRODUCTION

Currently, there exists a large gap in medical education with regards to training those with intellectual and developmental disabilities (IDDs). Given the higher rates of morbidity and mortality of these individuals when compared to the general population, this gap focuses more barriers in accessing opportunities and necessary healthcare. Medical advances have increased the life expectancy of those with IDDs 200% over the last 80 years; however, despite this remarkable improvement, individuals with IDDs still experience significant disparities in the quality of healthcare they receive. While there are multiple factors contributing to this, one of the most commonly cited is the lack of physician training. Some organizations are working to implement more direct cognitive disability content into the medical curricula\(^1\) but the process remains slow and will not keep up with the growing needs of the IDD population. Noting this discrepancy between healthcare needs of individuals with IDDs and the lack of medical education in regards to this population, MCW students formed the Friends for Special Needs (FFSN) student organization to implement additional programming.

FFSN focuses on building community-academic partnerships in order to increase awareness among MCW medical students about individuals with IDDs. The first partnership that was formed was in collaboration with the Down Syndrome Association of Wisconsin (DSAW). MCW students have various opportunities to work directly with DSAW self-advocates (community members) as well as with IDDs by engaging in events organized by DSAW; in addition to annual clinical skills events hosted by FFSN at MCW. The main DSAW events that MCW students are involved with are the annual DSAW walk and similarly Young Leaders Program sessions. The DSAW walk is a large, statewide public event which seeks to promote awareness and inclusion for those with Down Syndrome. The bi-monthly Young Leaders Program focuses on building confidence and social skills among self-advocates over the age of 16. The clinical skills event organized by FFSN exposed DSAW self-advocates to different medical skills by giving them a chance to practice with medical equipment, and sought to increase their comfort working with medical professionals. This event also allowed MCW medical students to practice working with individuals with IDDs in a clinical setting. Ultimately, these events provided opportunities for both medical students and individuals with Down Syndrome to work together while gaining a more informed perspective about the medical field and its role in providing sensitive care to those with IDDs.

A newer partnership has been initiated between FFSN and the Autism Society of Southeastern Wisconsin (ASSEW). Similar to the partnership with DSAW, this collaboration promotes increased awareness and comfortability between both medical students and individuals with IDDs, specifically those with Autism. The main event with ASSEW was a relationship and self-development Game Night where medical students engaged with self-advocates by playing board games in small groups. FFSN seeks to increase comfortability, education, and socialization between medical students and individuals with IDDs through community partnerships with DSAW and ASSEW. Direct community engagement with these groups allows for increased medical student knowledge about individuals with IDDs, which ultimately leads to improved medical care for this population.

METHODS

FFSN has been working with DSAW since 2017, and ASSEW since the fall of 2018. In terms of our collaboration with DSAW, the major event that we co-sponsored was the clinical skills workshop in which medical students formed groups with self-advocates from DSAW and their parents. Since 2017, two such clinical skills workshops have been held with a total attendance of 33 medical students, 13 self-advocates from the ages of 18-33, and 11 parent representatives. These workshops included two separate portions: the first of which was the clinical skills component. In this portion, the students and advocates participated in practicing the basic components of a physical, including heart rate, blood pressure, and musculoskeletal function. In the second portion of the workshop, the students presented a review of different forms of health-care providers, including the more prevalent specialists with whom self-advocates are likely to interact. Medical students, self-advocates, and parents were involved in the educational portion of the workshop.

In addition to the workshops, medical students regularly volunteer at the Young Leaders Program, hosted by DSAW. The walk aims to be an ongoing bi-monthly event that DSAW organizes to aid in the development of work ethic, communication skills, and nutrition and problem solving, among many other topics. At each event, medical students were able to interact with FFSN self-advocates as they go through different skills training activities. Another event that medical students are regularly involved in is the Walk for Down Syndrome Awareness and MedFest, a health screening event hosted by FFSN in collaboration with DSAW and ASSEW. Medical students also found benefit in the sessions described above. The literature is abundant with information surrounding the need for IDD training in medical education; however, little is done to implement\(^6\). According to the Association of American Medical Colleges, integrating disability training into medical school curricula is critical to closing gaps in health outcomes. The programming put on by FFSN specifically the learning and skills night, worked to address this by teaching the self-advocates to perform skills on the medical students that typically physicians would perform on them. This, in conjunction with discussing the general roles of different types of physicians and directly reviewing the self-advocate’s concerns resulted in those with IDDs feeling more confident and the comfort and satisfaction of those with IDDs with the physician-patient relationship.

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RESULTS

Feedback was obtained from both members of DSAW and MCW students regarding the community partnership between the two organizations. DSAW members were asked questions regarding individual comfortability with medicine along with their general thoughts on the partnership with MCW.

DSAW self-advocate feedback on the partnership with MCW

- "I understand the relationship with doctors more”
- "I have been going to the doctor for 4 years, and was finally able to check myself in”
- "I was able to make new friends”
- "Young Leaders is more enjoyable and lively when the medical students are there with us”

The Friends for Special Needs (FFSN) student organization was founded on the belief that medical students should educate themselves on what it means to work with individuals with IDDs so they could be better cared for by Medical College of Wisconsin’s future physicians, and to increase the comfort of those with IDDs with the doctor-patient relationship. Those goals were met through community-academic partnerships with The Down Syndrome Association of Wisconsin (DSAW, initiated in 2017) and Autism Society of Southeastern Wisconsin (ASSEW, initiated in 2018). Overall, the self-advocates from DSAW described having positive experiences working with the medical students because they felt comfortable speaking with them and could relate to them as individuals. This is an indicator that there are opportunities for the self-advocates to have meaningful interactions with the medical students within this partnership, and shows that the collaboration is reciprocal. Singer et al.\(^4\) showed that a major barrier in the physician-patient relationship with those with IDDs is how the physician approaches the patient’s vulnerability. The programming put on by FFSN specifically the learning and skills night, worked to address this by teaching the self-advocates to perform skills on the medical students that typically physicians would perform on them. This, in conjunction with discussing the general roles of different types of physicians and directly reviewing the self-advocate’s concerns resulted in those with IDDs feeling more confident and the comfort and satisfaction of those with IDDs with the physician-patient relationship.

Medical students also found benefit in the sessions described above. The literature is abundant with information surrounding the need for IDD training in medical education; however, little is being done to implement\(^6\). According to the Association of American Medical Colleges, integrating disability training into medical school curricula is critical to closing gaps in health outcomes. The programming put on by FFSN specifically the learning and skills night, worked to address this by teaching the self-advocates to perform skills on the medical students that typically physicians would perform on them. This, in conjunction with discussing the general roles of different types of physicians and directly reviewing the self-advocate’s concerns resulted in those with IDDs feeling more confident and the comfort and satisfaction of those with IDDs with the physician-patient relationship.

CONCLUSIONS

The introduction of the FFSN student organization at MCW provided an avenue for engagement between medical students and individuals with IDDs, which was previously noted as lacking in the standard medical school curriculum. FFSN has developed partnerships with both DSAW and ASSEW to both engage medical students with the IDD community and help individuals with IDDs become more comfortable with medicine. Events hosted by FFSN in collaboration with DSAW and ASSEW have shown favorable attendance and enjoyment from both medical students and the members of DSAW and ASSEW. The percentage of positive responses to survey questions from both self-advocates and medical students (survey forms from both self-advocates and medical students) shows FFSN hopeful that the programming can continue to expand. FFSN hopes to continue to support both students on what they feel is lacking in their education surrounding the IDD community and further adjust programming to increase attendance with the same level of both community member and student satisfaction.

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Community-Based Participatory Research: Stress Self-Management and Parents of Adult Children with Autism Spectrum Disorder

Susan A. Bonis, Ph.D. R.N., University of Wisconsin-Milwaukee; Emily Levine, B.A., Autism Society of Southeastern Wisconsin
Julie Quigley, M.A. Autism Society of Southeastern Wisconsin; Kathleen Hahn, Parent

Problem
1:59 children in the U.S. are diagnosed with autism spectrum disorder (ASD) (CDC, 2018). Their parents measure higher levels of stress than other groups of parents. This stress has primarily been attributed to their child’s challenging behaviors. Little is known about what these challenges are, how they vary, and how they affect parents as the child transitions to adulthood and independence.

Purpose

Method
Method: Community-based participatory research (CBPR). Key principle in CBPR: Members of the community are actively involved with the project
Advisory Group - 3 parents of adult children were involved – 2 of the parents are administrators of the Autism Society of Southeastern Wisconsin
- Development of initial survey study
- Development of current research question
- Development of focus group discussion guide
- Transition to individual and phone interviews
- Theme confirmation

Data Collection: 2 FG participants; 21 individual interviews; 1 phone interview
- Parents committed to participate in FG – cancelled due to behavioral and child related issues
- Parent advisory group suggested individual interviews with a phone interview option
- Extension of study was requested and granted, resulting in 22 interviews

Analysis: Thematic analysis was used to identify patterns and themes in the transcribed interviews. Themes were organized according to the contextual risk and protective factors of the Individual and Family Self-Management Theory (Ryan & Sawin, 2014). Themes were reported to and supported by the parent advisory group.

Results
Condition Specific Factors
Violence (complexity of condition)
- Children have meltdowns – adults have violent episodes
- Chapter 51 - Referral to homeless shelter from court judge
- Adult children missing and out of contact
- Suicide ideation, practice and attempts

Transition (trajectory)
- Transition from IDEA to ADA
- Break in healthcare - transition from pediatrics to adult
- Adult child responsible for own decision-making
- Parents not allowed access to Information for decision-making
- Parents not allowed access for Insurance options
- Guardianship challenges and choices

Physical and Social Environment
Diagnosis (Healthcare Access)
- 18/24 received informal ASD diagnosis from K-12, not from HCP
- Child’s needs met in the school system on an as-needed basis
- Transition to adulthood, ASD diagnosis needed to access services
- Accessing services was challenging - stigmatization & disrespect
- Parents lacking access to medical information

Socialization
- Peer acceptance is challenging – no longer worth the effort
- Bullying/incivility
- Isolation in parents home

Individual and Family Factors
Expectations
- Blame for behaviors is placed on diagnosis rather than child
- Children and adult children live up-down to parental expectations

Independent living
- Group living denied - social-communication and behavioral issues
- Support needed for executive functioning
- Sensory issues

Education
- College support - Stress and anxiety in college setting
- Social situation is challenging – bullying and incivility
- Support and ADA accommodations needed – child’s responsibility
- Sensory adaptation
- Motivation challenges

Employment
- Stress and anxiety in work setting
- Workplace relations are challenging – bullying and incivility
- Sensory adaptations needed
- Underemployed/unemployed - lose job – every 3 years

Conclusion
Parents across all ethnic, educational, and socioeconomic backgrounds experienced difficulty accessing diagnosis and services for their adult child with ASD.
Development and implementation of a community-based, pharmacist-led health screening service in Milwaukee

Michael DeBisschop, PharmD1, David N. Ombengi, PharmD, MBA, MPH1,2, Colleen Cornelius, MS1
Medical College of Wisconsin (MCW) School of Pharmacy1
Department of Family and Community Medicine2
Medical College of Wisconsin, Milwaukee, WI 53226

INTRODUCTION

• The MCW School of Pharmacy created a partnership with Next Door Foundation, an early childhood education center in an underserved neighborhood of Milwaukee, WI, with the goal of increasing community members' access to health care and impacting chronic disease outcomes.
• Pharmacists have the training and ability to perform physical assessment; and educate patients on the prevention and treatment of many disease states by using community engagement practices.
• Community engagement is ongoing to strengthen community members' access to health care and impacting chronic disease outcomes.
• YMCA members' access to health care and impacting chronic disease outcomes.

OBJECTIVES

• Develop a community-based, pharmacist-led community health screening program in an underserved area of Milwaukee.
• Increase health care access and awareness of common chronic diseases in the target community.

METHODS

• Analysis of multiple secondary data at state, county, city and zip code level were conducted followed by a 6-9 month period of community engagement activities to identify an underserved population and community partners in Milwaukee.
• The investigators engaged Next Door leadership, staff, community navigators and community members to determine the health needs and health screening services that would most benefit the community.
• Community listening sessions using one-on-one and small group meetings, surveys, health fairs, and review of existing literature were utilized to assess the health needs, barriers, and facilitators to quality care in the community.
• Community health screening and health education of participants for four leading chronic conditions: obesity, diabetes, high blood pressure, and high cholesterol were developed based on the health needs assessment.
• Referral partnerships were developed with free and low-cost clinics within the community for participants needing further care after point-of-care screenings.
• Operational testing was conducted for 4 weeks to refine the processes and ensure delivery of high quality services.
• Community engagement is ongoing to strengthen community-academic ties, build capacity, and leverage various community health resources to help reduce health disparities and improve overall health outcomes.

RESULTS

• Three contiguous zip codes (53206, 53209, and 53210) were identified from eleven low to medium-low social economic status (SES) Milwaukee zip codes, based on higher chronic disease burden and adverse social determinants of health (SDH) (see Figure 1 and Table 1).
• Health access, poverty, hypertension, hyperlipidemia, diabetes, obesity, food insecurity, and obesity were identified as major concerns in target neighborhoods (Figures 2 and 3), which the community controlled with scarce resources (Figure 4).
• Four initial screening protocols for CLIA waived point-of-care (POC) tests were developed based on community identified needs and current practice guidelines:
  - Blood Pressure
  - Blood Glucose
  - Body Mass Index (BMI)
  - Cholesterol
• Community health screening services were launched at Next Door in March 2019. Operational testing and participant satisfaction surveys results are shown in Table 2 and Figure 5.

CONCLUSION

• Four leading CVD and chronic diseases including hypertension, hyperlipidemia, diabetes and obesity were identified as a major concern in target neighborhoods based on community engagement activities and surveys.
• Pharmacists can work to impact the health of a community in ways other than traditional dispensing roles through screening, education, and referral networks.
• Leveraging secondary data, current practice guideline data and proactive community engagement is imperative in the development, implementation of a culturally and linguistically appropriate community health screening program.
• Over the next several years, long-term economic, humanistic and clinical outcomes of the participants will be assessed.

REFERENCES


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Mistrust, the Obstruction of Medicine: Repairing the Breach between Medical Research and the African-American Community in Milwaukee

Abdul-Ghaffaar Clark¹, Mikel Holt², Deborah Thomas³, Clarence Thomas³, Anne Mathias⁴, Ryan Spellacy⁵

1 Medical College of Wisconsin, 2 Black Research Organization, 3 House of Grace Ministry, 4 MCW Cancer Center, 5 MCW Center for Bioethics & Medical Humanities

Introduction

It is well known that participation rates in cancer clinical trials among African-Americans both nationally (Team, Gohagan, Prorok, Hayes, & Kramer, 2000) and in Milwaukee are unacceptably low. While the reasons for this have been documented in other regions, (Blocker et al., 2006; Robinson, Ashley, & Haynes, 1996) in Milwaukee they are currently unknown. Until the reasons for low participation among African-Americans in Milwaukee are known, attempts to increase participation will be uninformed and unsuccessful, as they will not address the root causes and -in turn - will fail to ameliorate cancer care inequalities that stem from a lack of research, as in prostate cancer among African-American males.

Study Aims

- **AIM 1:** Document the perceptions of the African-American Community in Milwaukee regarding cancer clinical trials, including reasons against participating in said trials.
- **AIM 2:** Document the factors or strengths in the African-American Community in Milwaukee that would positively influence their willingness to participate in cancer clinical trials.

Methods

- We conducted 3 focus groups with a goal of 8 subjects each, recruited via our network of churches.
- Audio recordings were transcribed and coded with two coders reconciling any disagreements between them.
- The coded transcripts were brought to the rest of the team for further reconciliation.
- The themes of the barriers and strengths of the community were thus identified, as well as any other salient themes.

Results

The transcripts revealed several themes, which were independently expressed by members of different focus groups. The following findings were reported as either barriers to participation in clinical trials or strengths that would positively influence participation:

- Lack of trust of medical research was described as a barrier, due to the history of abuse, especially relating to the “Tuskegee Study of Untreated Syphilis in the Negro Male,” by the U.S. Public Health Service.
- The influence of faith as well as the Pastor’s recommendation may increase participation in clinical trials.
- The majority of participants expressed that race of physician does not effect trust, although a minority expressed a preference for an African-American physician.
- African-Americans not being proactive with their health was described as a barrier.
- The lack of background medical knowledge to understand goals of clinical trials and the lack of understanding of informed consent were described as barriers.
- A strength promoting participation was an eagerness to help the next generation of all people or to help increase medical treatment specific to African-Americans.

Discussion

- Historic mistrust of the healthcare establishment is a barrier to research participation, but sincere, genuine personal relationships with physicians can generate trust. Trust may be gained on a personal level between patient and provider, which has the potential to foster trust in the medical establishment overall.
- Faith and leaders of religious communities may be strong allies in change.
- Continuous community engagement providing cancer awareness is openly desired. This increased presence and availability is necessary to generate trust and may also encourage community members to take a more proactive role in their healthcare.

Future Directions

- After we disseminate our findings to the local community, as well as local and national academic settings, we intend to leverage this qualitative research project to inform an intervention that can be tested through an NCI R21 grant - to design, build, and deliver effective interventions that remove barriers to clinical trial participation.
- One of our overarching goals is to increase participation in cancer clinical trials in an effort to better provide cancer treatment services to local communities.
- Another goal of our efforts is for our findings to serve as a resource for the implementation of other such programs in other communities nationwide.

Acknowledgments

- Community stakeholders - Pastors United Milwaukee
- Funding and support by MCW Cancer Center
Support for SUPREMES has been provided by the Department of Biomedical Engineering at the Medical College of Wisconsin and Marquette University, as well as the Children's Hospital of Wisconsin Foundation and the Children's Research Institute award (CRI 17-327 BRH). I would like to thank Dr. Quinn Hogan’s lab for the opportunity to work on the force forceps system and Bonnie P. Freudinger, ME for her mentorship and guidance.

The force forceps system has been fabricated, calibrated, and tested for reproducibility. It is able to produce a predictable output in the range from 0-1,750 g of force. The resulting system will provide a method to quantify the assessment of pain for researchers who are currently studying arthritic knee pain in the rat model.

The wiring and all electrical components will be installed in a housing to make the system safe for the user and prevent damage to system components. A power switch will be added to allow the user to turn the system on or off. A portable case will be designed and fabricated to enclose and protect the force forceps system. Measurement and calibration instructions will be written for the end user.

The system will be sent to the Hogan Lab for additional testing. A fabrication report will be generated.

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Acknowledgements:
Support for SUPREMES has been provided by the Department of Biomedical Engineering at the Medical College of Wisconsin and Marquette University, as well as the Children’s Hospital of Wisconsin Foundation and the Children’s Research Institute award (CRI 17-327 BRH). I would like to thank Dr. Quinn Hogan’s lab for the opportunity to work on the force forceps system and Bonnie P. Freudinger, ME for her mentorship and guidance.
AMYOTROPHIC LATERAL SCLEROSIS (ALS), also known as Lou Gehrig’s disease, is a neurodegenerative disorder affecting approximately 30,000 Americans. In ALS, motor neurons in the brain and spinal cord degenerate, causing progressive paralysis and death within 3-5 years. While two therapies are approved for the treatment of ALS, neither is a cure. Therefore, much work is still needed to be done in order to understand the disease progression and identify drugable targets. However, since most cases occur without a family history, what triggers disease development is unclear, which has made modeling ALS in the lab challenging. Through MCW’s SUPREMES high school outreach program, I am assisting with research in the Ebert Lab using induced pluripotent stem cells (iPSCs) to model ALS. iPSCs are made by genetically manipulating patient blood cells to revert them to a primitive state. Once reprogrammed, we can use various compounds to produce any cell type, including the motor neurons affected by ALS. In the present study, we generated iPSCs and then motor neurons from identical twins, one with ALS and the other in good health. We then sought to identify any differences between the twins’ motor neurons in their survival, morphology, and molecular processes that might explain the development of ALS. While we found no differences in survival or morphology, we found that the affected motor neurons have decreased expression of proteins important for maintaining molecular health and preventing cellular toxicity. We are now investigating how this change contributes to motor neuron loss and disease pathology.
Investigating the effect of nitric oxide treatment on HCMV replication

Mia H. Deaven¹, Rebekah L. Morky², & Scott Terhune, PhD.²
¹High School of Health Sciences, Wales, WI, ²Department of Microbiology and Immunology, Medical College of Wisconsin, Milwaukee, WI

INTRODUCTION

Human cytomegalovirus (HCMV) is the leading cause of viral-mediated birth defects in the United States with the most common being hearing impairment. Nitric oxide (NO) is a free radical produced by immune cells in response to infection by inducible nitric oxide synthase (NOS2). Preliminary data from our lab suggest that NO reduces viral DNA synthesis and virion production starting at 24 hours post infection (hpi). However, these data were collected by serum starving the cells to synchronize the cell cycle for infection and using a high multiplicity of infection (MOI) in which all the cells in the dish were infected. Here, we sought to determine if a low MOI and growth arrested cells would yield similar results observed during high MOIs. Similar to past results, we found that viral DNA levels are reduced during high MOI. We also found that infectious virion production was reduced in DETA/NO treated groups during low MOI. We hypothesize that NO inhibits HCMV DNA replication only at high MOIs, and inhibits virion production at both high and low MOIs.

BACKGROUND

Nitric oxide donor used in our experiments. NO spontaneously dissociates in a pH and temperature dependent manner.

RESULTS

CONCLUSIONS

ACKNOWLEDGEMENTS

I would like to thank the awesome people in the Terhune Lab. They were tremendous help to me, and I could not have completed this project without them. Support for SUPREMES has been provided by the Department of Biomedical Engineering at the Medical College of Wisconsin and Marquette University, as well as a Children’s Hospital of Wisconsin Foundation and the Children’s Research Institute award (CRI 17-327 BRH).
From Twinkies to Turnips; Cultivating Wisconsin’s Food Deserts
Elizabeth Mantey and TJ Harvey, David Nelson, Amy Rymaszewski, Ashley Brown, Mara Bottomley, Jaclyn Utrie, Jacob Vories

Specific Aim
We want to know how food deserts can affect cancer rates in the Milwaukee area. Understanding how the two are related can work to increase the accessibility of food for residents in these areas. We can test this by interviewing cancer patients about their food stories during and after cancer diagnosis. We can use the stories that we collect to find out what the needs of cancer patients are in regards to their food consumption during cancer treatment.

Collection of Stories
During a two hour session, the patient will be asked to share a story of a time during his/her cancer treatment surrounding their food experience. After they share their story, the interviewer will continue to ask further questions that arise during the story about family and cultural influences. A question on what an ideal food story would look like to the patient will finish the interview. There will be two interviewers per patient interview to avoid bias and to make sure that all necessary information is captured.

Recruiting Patients
Any patient who lives in Milwaukee County with the following zip codes: 53295, 53293, 53290, 53288, 53278, 53274, 53268, 53267, 53259, 53237, 53234, 53263, 53228, 53233, 53224, 53203, 53205, 53220, 53216, 53227, 53222, 53226, 53219, 53215, 53213, 53211, 53210, 53207, 53208, 53218, 53212, 53204, 53209, 53221, 53223, 53214, 53202, 53206, 53201; and has a diagnosis of breast cancer, or a family member that has a diagnosis of breast cancer, or a family member that has a diagnosis of breast cancer, or a family member that has a diagnosis of breast cancer. Economic factors in these areas can lead to poor access to healthy foods, otherwise known as a food desert. In these food deserts, populations have poor diets because of the inadequate access to healthier foods. A cause of breast cancer lays in the diet of populations. Breast cancer is 1.6-2.3 times higher in females with 26% breast density, and density increases with an increase in fatty tissue. Adipose inflammation from a large BMI results in a chronic inflammatory state that contributes to obesity-related insulin-resistance. For every 11 pounds a woman gains in adulthood increases her risk for postmenopausal breast cancer by 11%. It is found that the consumption of fruits and vegetables reduce the risk of breast cancer. There are links between lower breast cancer rates and higher levels of carotenoids in the blood. These compounds decrease the proliferation of human cancer cells, reduce DNA damage and genetic mutations, and enhance immunologic system functioning. Women who engage in a healthy diet and participate in regular physical activity are 88% less likely to die from breast cancer than women who have poor diets and do not actively engage in physical activity. An additional correlation between breast cancer and diet is within Metabolic Syndrome (MetS). Breast cancer is 56% more likely in women with (MetS). Obesity and increased adiposity contribute to changes in hormone regulation that lead to overproduction of estrogen, leading to breast tissue proliferation.

Food Deserts and Cancer
In 2017, it was estimated that 38590, Americans would be diagnosed with breast cancer. Economic deficiencies in populations can lead to poor access to healthy foods, otherwise known as a food desert. In these food deserts, populations have poor diets because of the inadequate access to healthier foods. A cause of breast cancer lays in the diet of populations. Breast cancer is 1.6-2.3 times higher in females with 26% breast density, and density increases with an increase in fatty tissue. Adipose inflammation from a large BMI results in a chronic inflammatory state that contributes to obesity-related insulin-resistance. For every 11 pounds a woman gains in adulthood increases her risk for postmenopausal breast cancer by 11%. It is found that the consumption of fruits and vegetables reduce the risk of breast cancer. There are links between lower breast cancer rates and higher levels of carotenoids in the blood. These compounds decrease the proliferation of human cancer cells, reduce DNA damage and genetic mutations, and enhance immunologic system functioning. Women who engage in a healthy diet and participate in regular physical activity are 88% less likely to die from breast cancer than women who have poor diets and do not actively engage in physical activity. An additional correlation between breast cancer and diet is within Metabolic Syndrome (MetS). Breast cancer is 56% more likely in women with (MetS). Obesity and increased adiposity contribute to changes in hormone regulation that lead to overproduction of estrogen, leading to breast tissue proliferation.

Analysis and Benefits
To analyze the stories we receive, we will assess the answers to the questions asked in addition to the patient’s body language while telling the story. We will look for common trends in each story on ways the patients experience food access and use these trends to find ways in which we can resolve these underlying community obstacles. This experiment can benefit society and the respondent. Although there is research present on how food deserts correlate with breast cancer incidences, having stories of ways food has impacted patients can emphasize the need to take action on the problem.

Food Deserts in Milwaukee
Food deserts are areas in the United States that have low densities of grocery stores, high densities of fast food restaurants and low fruit and vegetable availability. According to BMC Public Health, these areas can also be considered obesogenic environments: areas with high levels of nutrient-deficient, high calorie, but affordable food which promotes food consumption and low physical activity. The Center for Disease Control and Prevention (CDC) describes that food deserts arise from the lack of grocery stores in impoverished neighborhoods, areas with high shoplifting and neighborhood crime rates, and the growth of large chain supermarkets in suburbs where the population is more affluent. Food deserts can be linked to low-income areas due to the populations’ lack of resources to access food outside of their area. This lies as an issue in the city of Milwaukee. According to the Encyclopedia of Milwaukee, when looking at the city the southern and western parts of the city have been connected to higher socioeconomic status. Because of this, when looking at the two figures above, it is shown that in the southern and western parts of Milwaukee, there are smaller mortality rates. Having this knowledge allows us to look at the connections among food deserts and cancer within the cancer maps of Milwaukee county.

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Rewriting stories every day, n.d.
Socially Aware; Medically Unaware
Exploring Challenges in Transgender Health

Teague Peterson and Divyank Sharma
Chris Goetz, Tucker Keuter, Sam Polhemus, and Jacqueline Schaefer

Abstract:
To interrogate issues regarding transgender inadequate care, we decided to conduct a literature review to identify whether healthcare providers (nurses) were comfortable and/or confident when providing care to transgender patients. Through our research, we have concluded that the majority of nurses are not comfortable or confident when treating transgender patients. Therefore, it is imperative to better educate our medical professionals such that they are both comfortable and confident when caring for transgender patients. Thus, we propose developing a curriculum aimed at improving transgender health education, and as a result, relations between healthcare providers and transgender patients will improve.

Introduction:
Transgender health is an area where many medical providers lack a complete understanding of how to medically address patients to increase comfort and how to provide accurate medical services. Through our study we plan to develop an efficient course as a way for providers to access information regarding transgender health and further understand medical steps and processes when providing medical care for transgender patients. Through this course that we plan to develop as a result of our study, we plan to communicate and educate medical professionals in the field of healthcare about transgender health in order to bring awareness, increase knowledge, and improve the accuracy of medical diagnosis. Through our study, we plan to develop an efficient course as a way for providers to gain cognizance regarding transgender health while understanding medical processes for providing medical care to transgender patients.

Medical Student and Nurse Responses:

Curriculum Development:

Pronouns:
- Asking for preferred pronouns
Lack of education:
- Gender Dysphoria
- Hormone Therapy
- Surgery
Unsafe practices:
- Assessing and treating medical conditions more susceptible for transgender patients
- Look for self-treatment attempts made by patients
- Correctly prescribing medical treatments that are more efficient

Referrals:
- Compile list of surgeons/endocrinologists or create protocol for finding specialists

Conclusion:
Based on evidence from several studies, both patients and nurses have noticed a visible need for further understanding and education. Access to information can be challenging for providers, and access to knowledgeable healthcare providers can be challenging for transgender patients. This curriculum is an attempt to answer this issue, and while it has not yet been proven successful, anything is better than denying these nurses knowledge and denying these patients care. Future applications include testing the significance of the curriculum developed in a medical setting. If the developed curriculum proves to show an increase in comfort and confidence for medical professionals, the next step would be to test the curriculum at a national level rather than only in Southeastern Wisconsin.

References:
Improving Students’ Perceived Stress, Productivity, and Moods During Class Through the Integration of Plants Into Classrooms

Samantha Baldwin\(^1\), Jordyn Roby\(^2\), Hannah Worden\(^1\); Mentors: Megan LaCroix\(^3\), Nisreen Mobayed\(^4\), John Tierney\(^5\)

\(^1\)High School of Arts and Health, \(^2\)High School of Sciences, \(^3\)Milwaukee Academy of Science, \(^4\)Medical College of Wisconsin

Background

In today’s day and age, the average person spends 85% of their time indoors (1). Human interaction with a variety of natural objects is a part of the natural world that has been proven to help reduce stress and improve overall health (2). Despite the benefits, the decrease in outdoor time has increased stress, which has been proven to negatively affect work performance and quality of life (3, 4). As the amount of time spent in nature decreases, there is a need for healthier environments. This project involves the integration of plants into the classroom to reduce stress and improve wellbeing.

Experimental Methods

Our group chose one classroom from Kettle Moraine High School and one classroom in Milwaukee Academy of Science to give surveys to the classes that were held in that room during the school day. We designed two types of surveys for the students: a pre-experimental portion and a post-experimental portion. The first section includes statements relating to the subject’s perceived stress level, productivity level, and mood. These questions are designed on a five-point scale according to how strongly a subject agrees or disagrees to the statement given. The post-experimental survey is designed to evaluate the subject’s reported change in the areas stated above following our results of plant integration. Lastly, the post survey questions are designed to be answered on a five-point scale that they are to reflect further detail on whether or not the subjects perceived any improvement in their perceived stress levels, productivity levels, and mood levels during the experimental period. In order to ensure that we are able to compare our data accurately, we numbered the surveys to make sure that the students would get the same number during the pre and post survey.

We also paid attention to the layout of the classrooms in order to buy an amount of plants that would make a noticeable difference in the classroom. Ultimately, we decided on five plants for the Kettle Moraine High School classroom and eight plants for the Milwaukee Academy of Science classrooms.

When analyzing our data, we changed the possible responses (strongly disagree, disagree, neutral, agree, strongly agree) into numerical values (1, 3, 1, 3, 1, respectively). For each question, we found the average numerical response for the preliminary survey and then compared it to the average numerical response in the post survey, and graphed the averages to show the change in response.

Results

The classroom environment contributes to students’ feelings of apprehensiveness.

The classroom environment contributes to students’ feelings of apprehensiveness.

When analyzing our data, we changed the possible responses (strongly disagree, disagree, neutral, agree, strongly agree) into numerical values (1, 3, 1, 3, 1, respectively). For each question, we found the average numerical response for the preliminary survey and then compared it to the average numerical response in the post survey, and graphed the averages to show the change in response.

Figure 1: The classroom environment contributes to students’ feelings of apprehensiveness.

Figure 2: It is hard for students to pay attention during this class.

Figure 3: Students feel upbeat and optimistic about how they are progressing and learning new topics in this class.

Summary and Conclusions

Figure 4: Students find it hard to relax while in this classroom.

Figure 5: Both Schools Post Survey Responses

The addition of plants to this classroom environment has enabled students to improve their level of focus in this class.

Figure 6: Both Schools Post Survey Responses

The addition of plants to this classroom environment has helped students to relax during this class.

Both schools had an average response of 0.00, indicating a strong neutral response to the statement. This is consistent with our findings because it is a well-known fact that spending time in natural spaces contributes to improvements in concentration and overall stress relief. It is for this reason that research about the positive effects of natural environments on overall health and wellbeing is becoming more and more prevalent. Prior research on these effects in academic settings has been primarily done on college campuses rather than high school classrooms. The purpose of our study is to determine whether or not implementing plants into a high school classroom improves the students’ perceived stress, productivity, and mood levels.

Figure 1 shows the change in average numerical response to the statement “The classroom environment contributes to students’ feelings of apprehensiveness.” The classroom in Kettle Moraine High School’s (KMHS) preliminary surveys had an average response of 0.31, which is slightly higher than a neutral response to the statement. Their post survey showed a significant trend to 0.02, suggesting that less people agreed with the statement. This implies that the KMHS classroom had a noticeable decrease in student’s apprehensiveness. The classroom in Milwaukee Academy of Science (MAS) had a preliminary response average of 0.09, or slightly above a neutral response. The MAS classroom showed a decrease to 0.00, indicating that more people agreed with the statement. This suggests that the MAS classroom had a noticeable decrease in student’s apprehensiveness.

Figure 2 shows the change in average numerical response to the statement “It is hard for students to pay attention during this class.” KMHS’s classroom began with an average response of 0.00, indicating a strong neutral response to the statement. Their post survey data showed an increase in average response to 0.26, indicating that more people agreed with the statement. MAS did not show a significant difference in response to this statement, as their preliminary average was 0.22 and their post average was 0.24. In MAS’s case, most of the students disagreed with the statement throughout the entire study, while the data points did not seem to have an effect on the KMHS students’ ability to pay attention during class. It is unclear whether or not KMHS’s responses correlate to our experiment as responses may have been conflated with several confounding variables.

Figure 3 shows the change in average numerical response to the statement “Students feel upbeat and optimistic about how they are progressing and learning new topics in this class.” Both KMHS and MAS showed an increase in agreement to this statement over the course of the study. KMHS’s preliminary average was 0.45, indicating a slightly neutral response. Their post survey average increased to 0.71, indicating a higher level of overall agreement. MAS began with an average preliminary response of 0.00, indicating a more neutral response to this statement. There was a large increase in MAS’s post survey, with an average of 0.50 indicating a stronger agreement to the statement and up to 0.69, suggesting a slightly increased positive response to classroom optimism.

Figure 4 shows the change in average numerical response to the statement “Students find it hard to relax while in this classroom.” KMHS’s classroom preliminary average was 0.45, indicating an overall neutral to positive response to the statement. Their post survey average decreased to 0.24, indicating more people disagreed with the statement. MAS had an average of 0.02, indicating slightly less stress-relief during this class. At KMHS, the negative trend continued from 0.24 to 0.11, indicating a slightly lower level of stress-relief. The post survey of MAS shows a decrease to 0.00, indicating that more people either agreed or felt more neutral about their stress-relief during the post study. These changes could be a result of the integration of plants into the classroom, though we are limited in our ability to definitively make that conclusion due to the fact that these statements were not specifically about the effects the plants had on the students, just their overall feelings about their classroom environment.

Limits and Further Research

We had several limitations within our experimental process that may have changed the results of our study. One major limitation was the internal variation of subject participation. In both of our schools, the classrooms did not have windows to allow natural light in. Within this chosen intention to give more specific changes in response due to the fact that the classroom had no natural elements beforehand, it made our survey a limiting factor for some of the plants that we have required even sunlight. Three plants from Kettle Moraine High School and two plants from Milwaukee Academy High School died over the course of our study, and we attribute this to the fact that we did not thoroughly research the specific care needs of each of the plants species we bought.

Figures 6 and 7 show the change in average numerical response to the statement “Students find it hard to relax while in this classroom.” KMHS’s classroom preliminary average was 0.45, indicating an overall neutral to positive response to the statement. Their post survey average decreased to 0.24, indicating more people disagreed with the statement. MAS had an average of 0.02, indicating slightly less stress-relief during this class. At KMHS, the negative trend continued from 0.24 to 0.11, indicating a slightly lower level of stress-relief. The post survey of MAS shows a decrease to 0.00, indicating that more people either agreed or felt more neutral about their stress-relief during the post study.
Inflammatory Response in Spinal Cord Injury

Carolina Perez1,2, Nicolas Pelisch, PhD1,2 and Antje Kroner-Milsch, PhD1,2

1Department of Neurosurgery, Medical College of Wisconsin, VA Medical Center, Milwaukee
2Eisenhower High School, New Berlin, WI

ABSTRACT

Spinal cord injury (SCI) is a severe condition with tremendous impact on the health and quality of life in SCI patients and caregivers. Current treatment options of SCI are still very limited. By targeting the inflammatory response after SCI we aim to reduce the secondary damage, which occurs after the acute primary injury and is caused by inflammation and other processes. Finding a method to specifically reduce harmful immune reactions could potentially lead to better functional outcome for SCI patients. The first step is to understand the composition of the tissue lesion is the use of various staining techniques. Hematoxylin and Eosin (H & E) and immunohistochemical staining allows us to detect cells such as microglia, blood derived macrophages and astrocytes. This analysis helps us to identify the overall size and shape of the lesion as well as the change in presence of various cell types. In a more severe lesion, there is expected to be an increase in the number of astrocytes, activated microglia and macrophages. These findings will increase our understanding of SCI and could give rise to a treatment that targets these inflammatory cells.

OBJECTIVE

To analyze the amount of microglia, blood derived macrophages and astrocytes in SCI and to compare lesion sizes.

METHODS

Tissue Freezing:
After a laminectomy, the spinal cord was frozen in adhesive Tek at -80°C. The block of tissue was then cut transversely to 14μm thickness using a Cryostat and placed on slides.

Hematoxylin & Eosin (H&E) Staining:
After being placed in a desiccator for 30 minutes, the slides were placed in ethyl alcohol (E10H) for one minute. Next, they were dipped in tap water five times and placed in Harris Hematoxylin for five minutes. The slides were then rinsed with tap water and placed in a bluing solution for 40 seconds. After that, they are rinsed with tap water again for two minutes and placed in 70% E10H for one minute with agitation. They were then placed in Eosin Y for one minute followed by four changes in 100% E10H. Finally, the slides were placed in Xylazine for one minute with agitation three times.

GFAP Staining:
Being a type of immunostaining, this method utilizes antibodies to identify the GFAP, a marker protein for astrocytes. In this process, a primary antibody is used to recognize and bind directly to the antigen epitope. It is made from an animal of a different species than the specimen. This antibody does not contain fluorescence and, therefore, cannot be visualized. Next, a secondary antibody is used which attaches only to the primary. In order to prevent non-specific binding, it is derived from an animal of a species that differs from both the specimen and the primary antibody. The secondary antibody contains fluorescence which allows for visualization of the targeted antigen. Figure 2 depicts GFAP through a secondary antibody containing green fluorescence. This indicates the presence of astrocytes found in the spinal cord. Figure 2A. demonstrates the nature of astrocytes in an uninjured spinal cord. For comparison, Figure 2B. reveals the impacted structure of a SCI through an absence of functional astrocytes.

Diagram of Immunostaining:

Tissue Freezing:
A sample of injured spinal cord tissue exhibiting the presence of GFAP in astrocytes. B. The epicenter of a SCI. The absence of astrocytes is denoted by the green stain binding to GFAP.

RESULTS

H&E Staining:
This is a basic stain used to examine the structures of tissues. The violet hematoxylin is responsible for staining nucleic acids while the eosin stains nonspecific proteins. This results in a range of pinks and purples mapping out structures within the tissues. In Figure 1A and B, the ventral and dorsal horns of the uninjured spinal cord can clearly be identified; the white and gray matter in the injured tissue are indistinguishable. There is also a visible lesion located at the epicenter of the SCI indicated by an absence of tissue.

GFAP Staining:
Being an antibody of the same species, this method utilizes antibodies to identify the GFAP, a marker protein for astrocytes. In this process, a primary antibody is used to recognize and bind directly to the antigen epitope. It is made from an animal of a different species than the specimen. This antibody does not contain fluorescence and, therefore, cannot be visualized. Next, a secondary antibody is used which attaches only to the primary. In order to prevent non-specific binding, it is derived from an animal of a species that differs from both the specimen and the primary antibody. The secondary antibody contains fluorescence which allows for visualization of the targeted antigen. Figure 2 depicts GFAP through a secondary antibody containing green fluorescence. This indicates the presence of astrocytes found in the spinal cord. Figure 2A. demonstrates the nature of astrocytes in an uninjured spinal cord. For comparison, Figure 2B. reveals the impacted structure of a SCI through an absence of functional astrocytes.

Figure 1. A sample of H&E stained tissue that indicates the uninjured structure of the ventral and dorsal horns at 4x and magnified at 10x. B. A sample of injured spinal cord with the same H&E stain. 4x and 10x.

Figure 2A. A sample of uninjured spinal cord tissue exhibiting the presence of GFAP in astrocytes. B. The epicenter of a SCI. The absence of astrocytes is denoted by the green stain binding to GFAP.

Figure 3. Cricsect segments of spinal cords cleared with Clarity and stained with DAPI and observed at 4x and 10x.

REFERENCES


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SUMMARY

1. SCI was observed to have a disturbance in the structure of the white and gray matter tissue in comparison to an uninjured, spare tissue. This resulted in the inability to identify the ventral and dorsal horns of gray matter.
2. An absence of astrocytes at the site of impact indicates glial damage and a prolonged inflammatory response.
3. CLARITY staining has the potential to provide a more accurate analysis of SCI and lesion volume. However, it is currently an underdeveloped method that requires more adequate technology.

FUTURE DIRECTIONS

Dr. Kroner’s lab is currently investigating treatments to reduce the prolonged inflammation caused by SCI. Further analysis of the lesion site will lead to progressive methods of amplifying an immune response to decrease recovery time and potentially improve patients’ quality of life.

The advantage of having a more detailed assay of SCI will encourage the development of advanced technology in attempts to properly visualize the three dimensional lesion.

CLARITY:
Is a method of clearing tissue to allow for staining and structural analysis of the full spinal cord as a three dimensional sample. The current methods of computing the lesion volume are less precise due to the fact that they cannot account for the human errors possible when freezing, cutting, and staining the tissue. Because the tissue remains intact, the stained lesion site can be more accurately measured. However, it is currently difficult to evaluate the full structure because technology is not yet equipped to view a three dimensional tissue sample rather than a two dimensional slice. With a traditional microscope having been used for all three figures, the samples in figure 3 are of lesser quality and not fully focused, indicating an uneven surface.

RESULTS

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Support for SUPREMES has been provided by the Department of Biomedical Engineering at the Medical College of Wisconsin and Marquette University, as well as a Children’s Hospital of Wisconsin Foundation and the Children’s Research Institute award (CRI 17-327 BRI). We would also like to thank Dr. Brian Hoffmann for organizing the SUPREMES program as well as Dr. Kroner and Nicolas Pelisch for working in cooperation with the program.
Endothelialization of Novel Magnetic Flow Diverters Using Magnetically-Labeled Endothelial Cells

Joseph N. Cherny, MCW; Akankshya Shradhanjali, PhD, MCW, Biomedical Engineering; Raphael Sacho, MD, MCW; Brandon J. Tefft, PhD, MCW/Marquette University, Biomedical Engineering

INTRODUCTION

Flow diverters are devices used to treat cerebral aneurysms by reducing blood flow to the aneurysms. The reduction of blood flow causes blood in the aneurysm to clot, preventing it from rupturing. The issue with flow diverters is that after they are implanted, there is a risk of blood clots forming on the device until it is completely covered with endothelial cells, and the patient must be on an antiplatlet regimen to prevent blood clots from forming on the device. The antiplatlet regimen needed to prevent clots puts a patient at risk for a variety of issues. If a patient has a preexisting condition that may cause them to bleed, such as stomach ulcers, the antiplatlet therapy can put them at risk for severe internal bleeding. Additionally, patients are put at risk by the antiplatlet therapies in the case that they may need emergency surgery. The surgery would need to be delayed to reverse the antiplatlet therapy, which could put the patient at a significant risk, and if the antiplatlet therapy is not reversed, the patient could bleed out during surgery. This project serves to determine if magnetic flow diverters can be rapidly endothelialized with super paramagnetic iron oxide nanoparticles (SPIIONS) labeled endothelial cells, and to test if the process of magnetic endothelialization can be used on flow diverters with the same success as in previous studies on magnetic stents.

METHODS & RESULTS

Cell Viability Study

The first experiment performed was using an In Vitrogen LIVE/DEAD Viability/Cytotoxicity Kit to determine the cytotoxicity of the control and experimental flow diverters. To perform this assay, working solutions of two micromolar Calcein AM and four micromolar EthD-1 were made. The working solutions were added to the flow diverters, and the assay was incubated for 45 minutes at room temperature. The percent living and dead cells on each device were averaged, and the results for all of the dead cell counts on each device were averaged. The percent living and percent dead cells on each device based off the averages can be found in the graph below.

![Graph showing percentage of living and dead cells](image)

This is just a preliminary study. This graph shows that the experimental flow diverters had a higher average % of living cells than the control device, but the data in this table is not statistically significant because it is the results of only one LIVE/DEAD assay due to time constraints. The assay will be repeated again for more significant data.

<table>
<thead>
<tr>
<th>Trial Number</th>
<th>Control Device</th>
<th>Experimental Device 1</th>
<th>Experimental Device 2</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0097</td>
<td>0.0206</td>
<td>0.0201</td>
</tr>
<tr>
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<td>0.0250</td>
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<tr>
<td>3</td>
<td>0.0118</td>
<td>0.0282</td>
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</tbody>
</table>

Magnetic Field Measurements

All magnetic measurements were taken using the Micromagnetic Spin/Field 30 and Micromagnetics zero-Gauss chamber. The data in the table is measured in Gauss, and is the software-calculated total value for all of the axis combined.

CONCLUSIONS

- Based off of the preliminary results from the cell viability assay, it appears that the experimental flow diverters are more viable than the control flow diverters, meaning there is a possibility that these devices can be tested in vivo. More testing needs to be done to determine statistically significant results along with mechanical measurements and thrombogenic assays.
- The magnetic measurements allow me to conclude that the experimental flow diverters do produce an electromagnetic field stronger than that of the control devices.

FUTURE DIRECTIONS

This project should be continued through a cell capture and retention study, and if that study is successful, experimenters should attempt to implant and endothelialize a magnetic flow diverter in a large animal model.

REFERENCES


Acknowledgements:

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