

### Background

Gardening has a wide variety of benefits that can improve our overall health and wellbeing<sup>2</sup>. It has been shown to reduce pain<sup>5</sup>, improve our mental health<sup>1</sup>, and increase social interaction<sup>3</sup>. Gardening is a physical activity that can also improve our nutrition with fresh fruits and vegetables, both of which help to reduce the risk of chronic diseases such as obesity, diabetes, and heart disease<sup>4</sup>.

However, being faced with physical limitations can make gardening stressful and even painful at times. Individuals of advanced age and with disabilities often encounter barriers to accessing a garden or having the ability to fully experience garden activities. The aim of this project was to provide adaptive tools and techniques to make gardening more accessible to these individuals.

Adaptive gardening is the practice of changing the way we garden so that it can be performed by individuals of any age or mobility level. Adaptive garden tools are ergonomically designed to make gardening easier on our body and more enjoyable. They're made to reduce the stress and strain that we experience while working in a garden. Adaptive gardening also includes utilizing innovative gardening techniques such as raised garden beds to elevate our garden surface and reduce the burden on our body.

### Project Goals

The goal of this project was to establish a collection of adaptive garden tools for individuals who are physically limited, including those of advanced age or those with injury or disability, to use during therapeutic horticulture programs and to try out at home in their own garden.

If we improve access to garden tools designed for people with reduced or limited physical ability, then individuals will utilize the tools and be positively impacted by removing a barrier to activity. By providing therapeutic horticulture programming and an adaptive set of garden tools, we can help individuals gain the skills needed to garden for life.

### Tool Examples

- Long handled and telescoping tools can be used from a seated position to prevent hip and back strain.
- Gloves with Velcro straps can hold the tool in your hand if you've lost any hand strength due to a spinal cord injury, stroke, or carpal tunnel.
- Tools with forearm cuffs are useful if you have arthritis and experience wrist pain.
- Several kneeling pads are available to protect our lower extremity joints.



### Methods

1. Participants were presented information about adaptive garden tools and therapeutic horticulture:
  - a. Health benefits of gardening and therapeutic horticulture
    - i. Social, intellectual, physical, emotional, and spiritual benefits
  - b. Garden design, plant selection, effort reduction techniques
  - c. Ergonomic and adaptive garden tools
  - d. Cost effective ways to improve current tools
  - e. Injury prevention and healthy gardening habits
2. The tools were introduced and demonstrated, then participants had the opportunity to handle the tools and try them out
3. The project was explained along with the informed consent and any questions were answered
4. Survey was distributed and data was analyzed

IRB Approved: PRO00034676



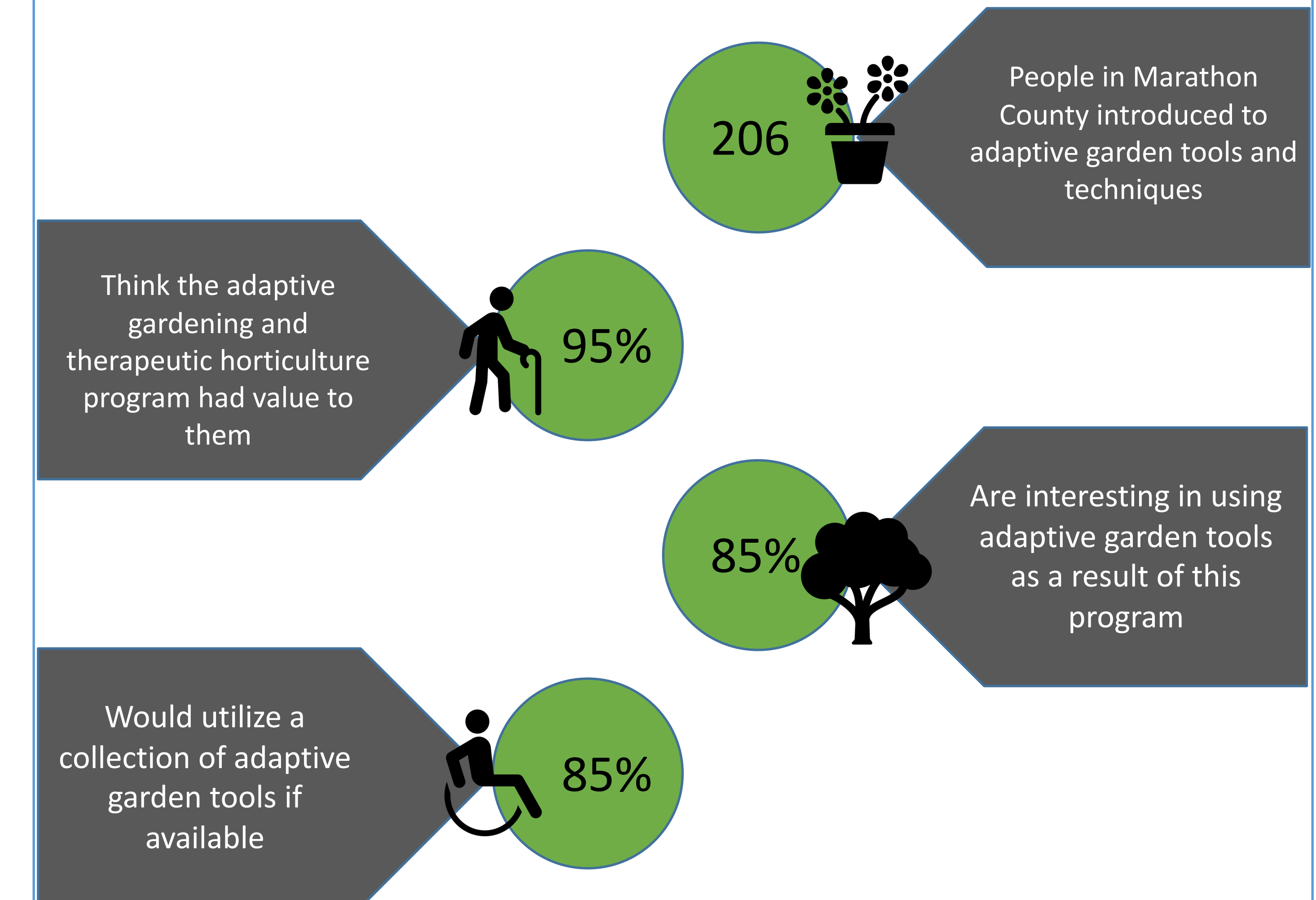
### Participant Comments

*"I wasn't aware of so many tools which assist us in gardening."*

*"I bought the ergonomic watering can from your presentation and it's already helped my back pain"*

*"I've been trying to make gardening easier so I can continue to garden for a long time in the future – these tools will help"*

### Results



### Future Directions

- There are two complete sets of adaptive garden tools. One will be stored at Marathon County Public Library and tools can loaned out by individuals, just like other library resources. The second set will be at Midstate Independent Living Choices and available for loan by anyone in the state of Wisconsin through the assistive technology program, AT4ALL.
- Informational booklets will be included with each set that details the tool uses, health benefits, cost, and where each item in the set can be purchased.
- A cleaning protocol will also be included with each set of tools to prevent disease spread between gardens.

### Acknowledgements

Funding: Incredible Bank, Master Gardeners of Northcentral Wisconsin  
Presentation locations: UW-Stevens Point at Marathon County, The Landing, Marathon County Public Library, Wausau Garden Club, Monk Botanical Gardens  
Future tool storage and distribution: Marathon County Public Library, Midstate Independent Living Choices

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## Background

Hispanic breast and gynecological cancer survivors (BGCS) are more likely than Non-Hispanic White BGCS to have overweight/obesity.

- Obesity increases recurrence risk for many cancers.
- Weight management is a complex interaction of environmental, societal and policy-related factors.
- These factors also contribute to disparities in cancer recurrence risk, quality of life and comorbidities.

The current study leverages the successful efforts of the Moving Forward (MF) weight loss trial with African American Breast Cancer Survivors and seeks to adapt MF for Hispanic BGCS.

## Methods

Intervention adaptation was done in an iterative process with continuous engagement of Hispanic BGCS and a Community Advisory Board (CAB).

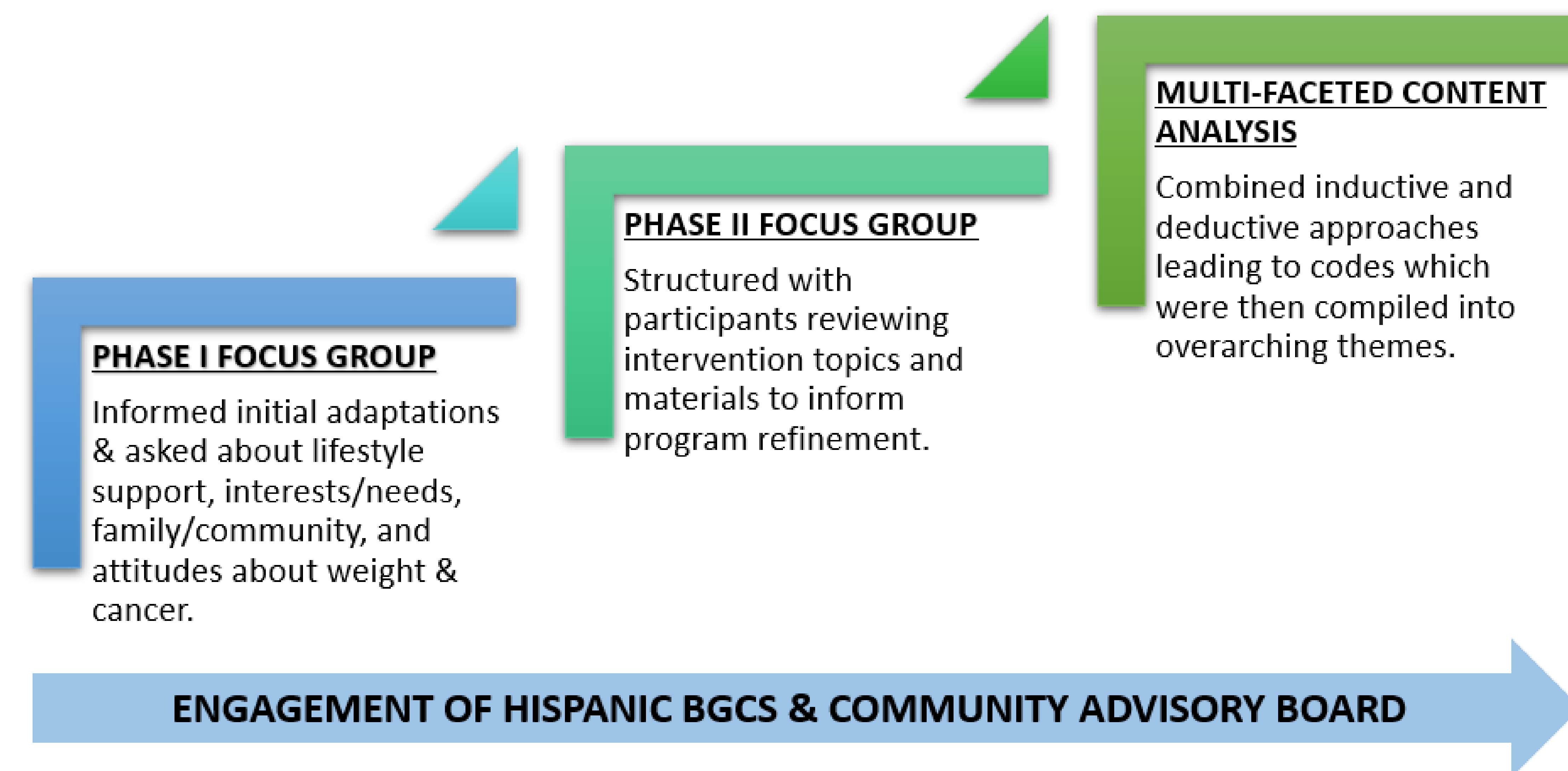


Figure 1: Adaptation Process Methodology

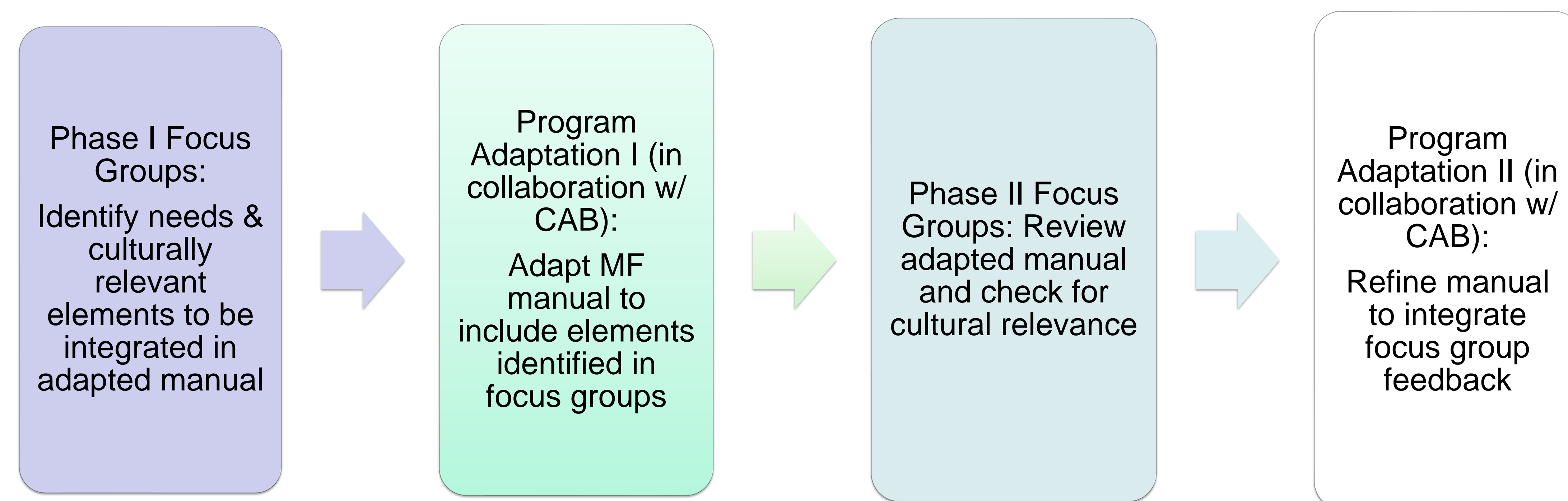


Figure 2: Adaptation Process Timeline

## Results

### Cross Cutting Themes and Categories Across Experience

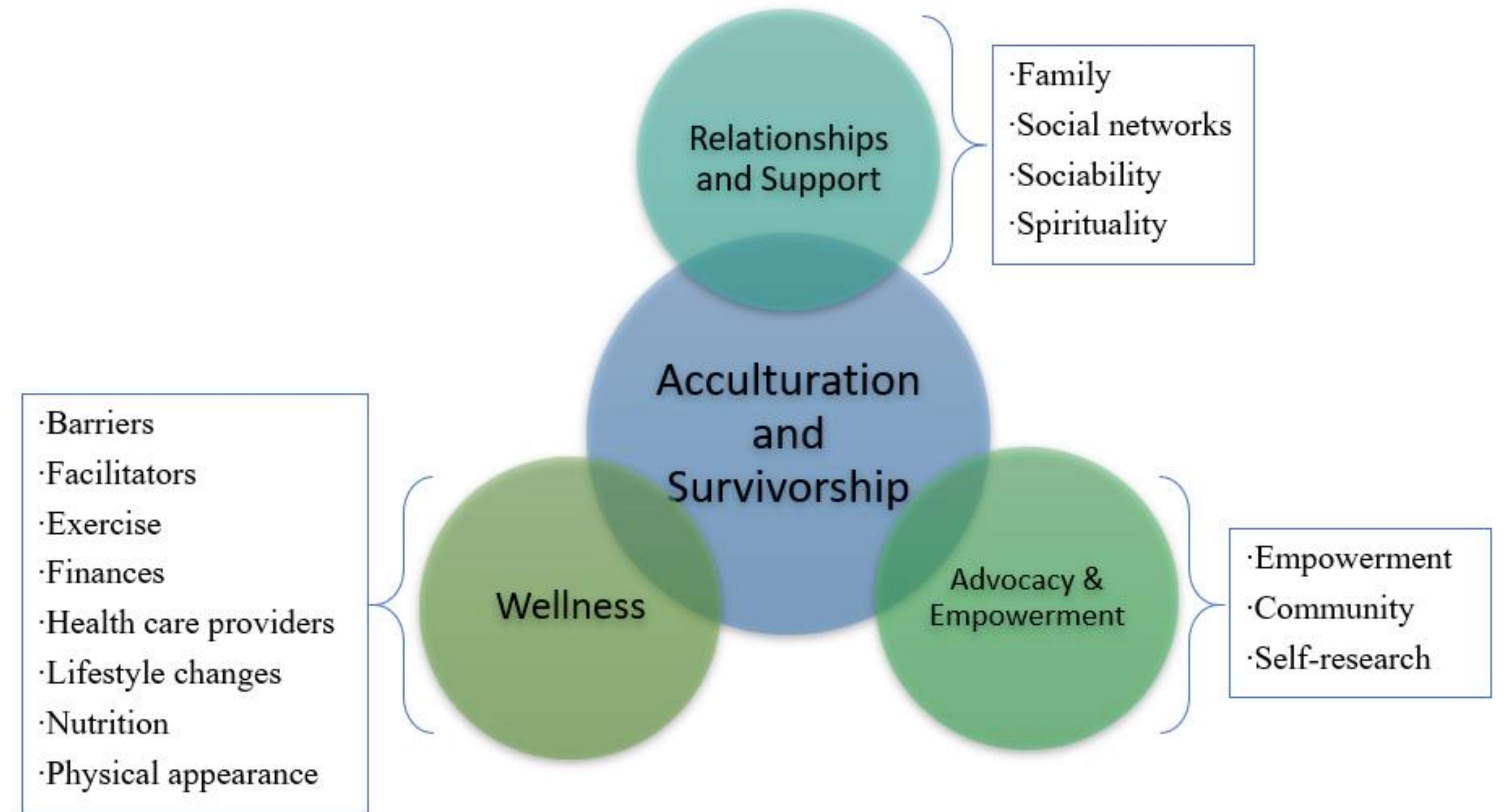


Figure 3: Focus Group and Interview Content Themes & Categories

### Phase I Data Collection: 30 HBGCS

- 4 focus groups
  - 1 Spanish
  - 3 English
- 16 individual interviews\*
  - 12 Spanish
  - 4 English

\* more accessible to predominately Spanish-speaking women

### Phase II Data Collection: 24 HBGCS

- 5 focus groups
  - 2 Spanish
  - 1 English
- 8 individual interviews\*
  - 3 Spanish
  - 5 English

\*as trust-building practices increased more predominately Spanish-speaking women participated in focus groups

## Key Findings & Next Steps

- Participants with **lower acculturation** were more reliant on family, more likely to identify barriers over facilitators, and heavily relied on community advocacy as a source of empowerment.
- Those **more acculturated** to the US host culture were more independent and autonomous, placed greater emphasis on physical appearance concerns, and were more likely to incorporate self-research in provider-patient conversations.
- **Currently** we are piloting the Avanzando Juntas quality of life and weight loss program with COVID-19 accommodations
  - Primary outcome is weightloss
  - Secondary outcomes include metabolic syndrome markers, fear of cancer recurrence, quality of life and self-efficacy
  - COVID-19 accommodations include screenings, virtual attendance options and smaller class groups
  - Exploratory aims will assess the relationship between level of acculturation and self-advocacy in Hispanic cancer survivors.



# A framework for transformed community-academic partnerships to reduce cancer disparities: A Case Study

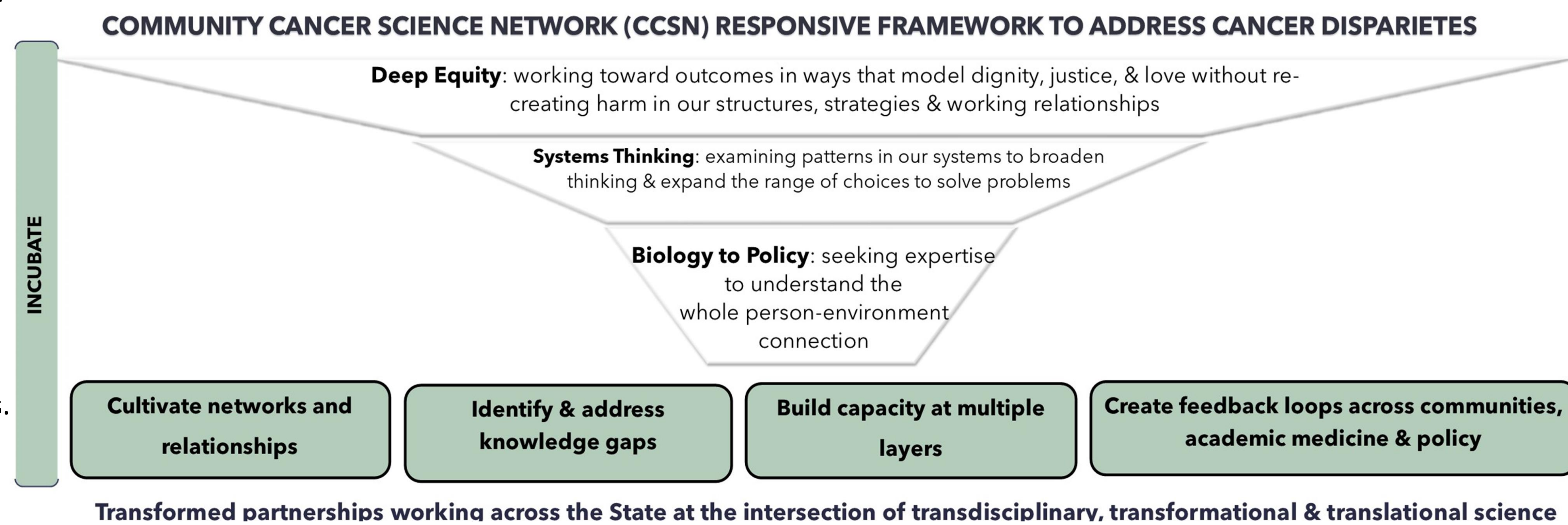
**Authors:** Tobi Cawthra, MPH, MCW, Cancer Center; Laura Pineseault, PhD, Evaluation Plus; Beth Brunner, Wisconsin Cancer Collaborative; Deborah Thomas, DD, House of Grace Kingdom Ministry; Carol Williams, PhD, MCW, Pharmacology and Toxicology; Melinda Stolley, PhD, MCW, Medicine

## BACKGROUND

To meaningfully impact breast and lung cancer disparities, scientists and community must work together differently.<sup>1</sup> The Community Cancer Science Network (CCSN) offers a framework for transformed community-academic partnerships that leverages more recent applications of community-based participatory research (CBPR) principles to include equity and justice.<sup>2</sup> The framework contains three distinct phases: Incubate, Innovate, and Integrate.

In this case study, we showcase how CCSN supports its first funded project, the *Cancer Disparities Curriculum for Research and Community Scholars*, through the Incubation stage of the framework (Figure 1) to establish a trusted partnership between community-academic co-investigators and shared vision of solutions to address cancer disparities. The Incubation phase led to the co-designing of a curriculum for early career basic science researchers and community members to co-learn, share perspectives on health and research and offers a new way for community and academic medicine to work together.

Figure 1: CCSN Framework Incubation Phase



## METHODS

The Research-Community Scholar project team consisted of an academic and a community Co-PI and the CCSN Leadership team. Over a 15 month period of weekly 60-90 minute meetings, the CCSN Leadership team supported the Research-Community Scholar Co-PIs through the Framework to co-create the project and funding proposal. The CCSN Program Manager and a Developmental Evaluator framed meeting agendas, discussions and next steps through the Framework's guiding principles and strategies (Figure 2).

Figure 2: Application of Framework

Deep Equity	<ul style="list-style-type: none"> <li>Co-developed vision</li> <li>Equal decision-making authority</li> <li>Consulted diverse expertise</li> <li>Examined the context perpetuating the problem and named it</li> <li>Created space to be vulnerable/build trust</li> </ul>	Cultivate Networks	<ul style="list-style-type: none"> <li>Meeting time and structure to allow time for relationships</li> </ul>
Systems Thinking	<ul style="list-style-type: none"> <li>Focus results for institutions not only scholars</li> <li>Paused process to ask what we are learning</li> <li>Designed curriculum to address barriers identified in early research</li> </ul>	Identify & Address Knowledge Gaps	<ul style="list-style-type: none"> <li>Agendas focused on exploring ideas and identifying learning needs as opposed to tasks and activities</li> <li>Willingness to admit opinions/ideas/beliefs were wrong</li> </ul>
Biology to Policy	<ul style="list-style-type: none"> <li>How we defined our learners – bench science with broader interest of incorporating community responsibility in their professional identity</li> </ul>	Build Capacity	<ul style="list-style-type: none"> <li>Gradual shifting of ownership from CCSN Hub Program Manager to Co-PIs</li> <li>Deployed rapid evaluation methodologies to iteratively answer design questions</li> </ul>
		Develop Feedback Loops	<ul style="list-style-type: none"> <li>Develop comfort in early sharing of ideas in conversation with wide audience of stakeholders representing MCW and potential community scholars and their networks</li> </ul>

## FINDINGS

### 1) Evidence of Transformed Partnerships

A third-party evaluator conducted journey mapping interviews to better understand how the co-investigator team was moving towards a transformed partnership.<sup>3</sup> CCSN's concept of transformed partnership looks at three dimensions:

- Individuals develop a growth mindset, understanding of the connection between science and quality of life, sense of humility & capacity to examine and work with one's bias
- Relationship between partners allows for trust, vulnerability, and belonging
- Interactions are based on shared power, decision making, and resources.

Co-PIs reported that they felt:

- Part of something bigger
- Growth from understanding different perspectives
- Strong, trusting, equitable relationships
- Required significant time commitment
- Learned something new
- Create lasting connections
- Confused and frustrated at times but ultimately worth time investment
- Engaged in an unique experience

### 2) A Principles-Grounded Solution to Disparities

The funded result of this process is an initiative intentionally designed to support academic medicine in earning community trust by bringing together Milwaukee community members ("Community Scholars") and MCW early-stage biomedical researchers ("Research Scholars") in a shared curriculum that will address the origins, causes, and potential solutions to the many factors that promote cancer disparities.

The curriculum will be delivered in 9 months using multiple ways of engaging with content, personal exploration/reflection, and opportunities to apply learning through small team assignments and projects. Core elements of the curriculum will include:

- Course content delivered in lecture format by faculty from both academic medicine and the MetroMilwaukee community
- Opportunities for collaboration within and across sectors
- Project-based team learning where a Community Scholar and Research Scholar work together and disseminate to both community and academic audiences
- Tools for assessing personal and professional growth
- Recognition for completing the curriculum and continuation with the alumni network

## CONCLUSION

An adaptive framework and iterative processes provide the opportunity to quickly identify challenges and successes and to pivot strategies for successful outcomes. **Even when individuals experienced emotions which might lead them to give up the work or return to a more traditional approach, the supportive CCSN structure and the transformed partnership allowed the team to push beyond uncertainty.**

## ACKNOWLEDGEMENT

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# Prescription Medication Disposal Methods in Marathon County Among the Aging

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## Abstract

The opioid epidemic is a multifaceted crisis that continues to impact communities in the United States both large and small. The Midwest saw a 70% increase in opioid overdoses from July 2016 through September 2017<sup>1</sup>. As many as 80% of heroin users first misused prescription medications<sup>2</sup>. It is evident that limiting access to expired and unused prescription medications in Marathon County is an important element in preventing future opioid overdoses.

The purpose of this study was to evaluate the use of current medication disposal practices, as well as the use of new prescription medication disposal methods (i.e. Deterra Pouches), among the aging in Marathon County.

As part of educating the community on proper drug disposal methods, Deterra Pouches were distributed with infographics detailing the county's permanent drop box locations and the importance of proper medication disposal methods. This study aimed to help decide if future investments in Deterra Pouches would be a worthwhile allocation of funding to reduce prescription medication abuse, and if permanent drop box locations are sufficient. This study found that **100%** of participants who reported having expired/unused medications at home also reported using their Deterra Pouch.



## Background

Research has shown that access to healthcare, specifically the amount of pharmacists and dentists, is directly associated with increased rates of opioid abuse<sup>3</sup>. Therefore, it can be concluded that the abuse of prescription opioids is partly an iatrogenic epidemic.

The opioid crisis has been recognized by several federal agencies. In 2011, the Office of National Drug Control Policy launched the Prescription Drug Abuse Prevention Plan (The Plan) to expand the National Drug Control Strategy from the Obama Administration. The Plan identified several elements to reduce the abuse of prescription drugs, including requiring prescription drug "take-back" programs and drop box locations. Drop boxes allow community members to return unused and/or expired prescriptions, including opioids, in a legal and environmentally conscious manner. In the Wausau area, there are currently eight permanent drop box locations, with the possibility of more to be added in the future.

Deterra Pouches are another newer method of safe drug disposal. These are small, disposable bags that allow community members to safely, effectively, and conveniently deactivate and dispose of medications in their home, without needing to travel to a permanent drop box location. The bags work by placing medications in the pouch with warm water. The water dissolves an inner pod which releases activated carbon to deactivate the drugs. The single-use bag can then be thrown away through regular at-home trash disposal. These bags are beneficial since they render drugs (including opioids) unavailable for abuse. They also remain safe for landfill disposal and reduce watershed contamination. This disposal method may be particularly effective in the aging population, who may have limited ability to access permanent drop box locations, making them an ideal target population for this study. The aging and disabled populations historically have several risk factors related to expired or unused medications. These potential risks can include a higher quantity of prescriptions, caregivers with access to their medications, and children and/or grandchildren in their home who could abuse or accidentally ingest their medications.

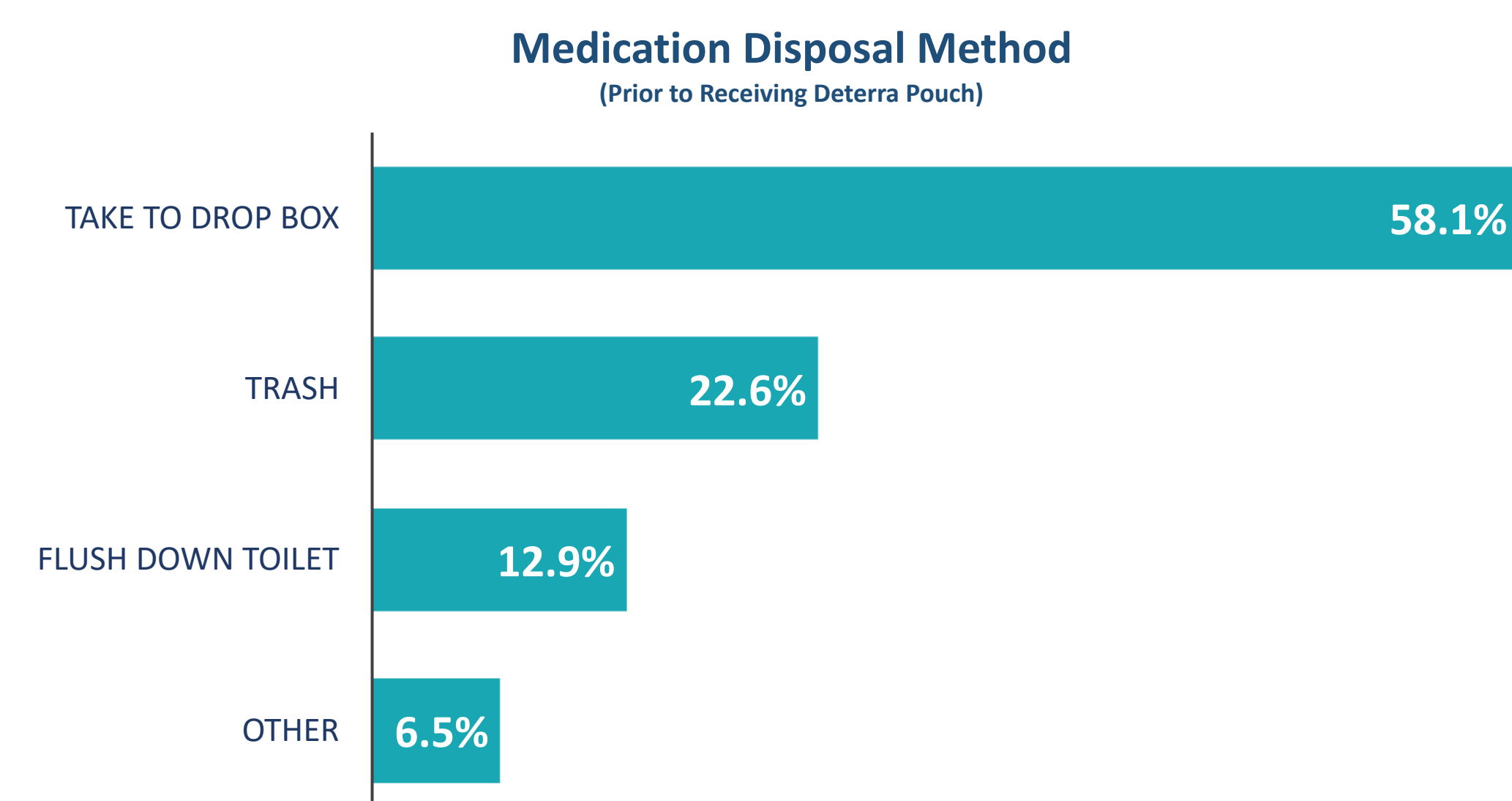
## Methods

This was a cross-sectional study consisting of a printed anonymous survey. The survey was distributed at the same time as all study materials, which included a Deterra Pouch, infographics concerning proper medication disposal, and information detailing the permanent medication drop-box locations in Marathon County.

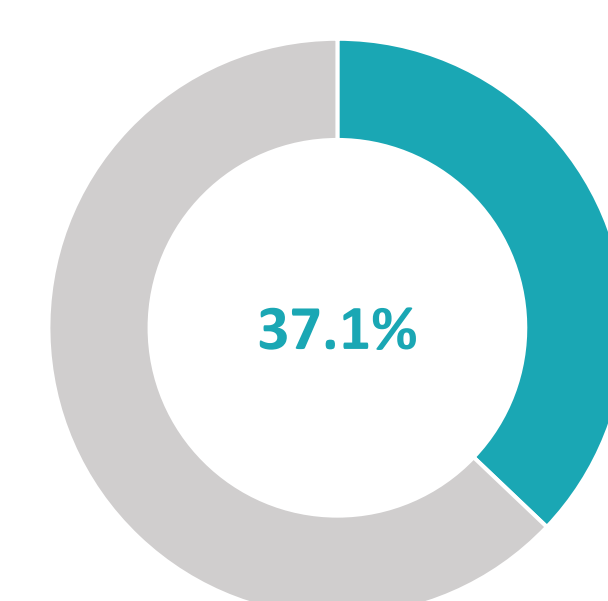
Participants for this study were selected based on being permanent residents of Marathon County who received 'Meals on Wheels' benefits from the Aging and Disability Resource Center of Central Wisconsin. To be considered for 'Meals on Wheels', one must be 60 years old or older and essentially homebound due to illness or disability. There were 175 participants in this study.

All study materials were distributed to the participants in their homes by volunteer drivers for 'Meals on Wheels' during regularly scheduled meal delivery services. Participants were instructed to review the materials, complete the survey, and seal the survey in a provided envelope to ensure anonymity. After two weeks, 'Meals on Wheels' drivers collected the completed surveys.

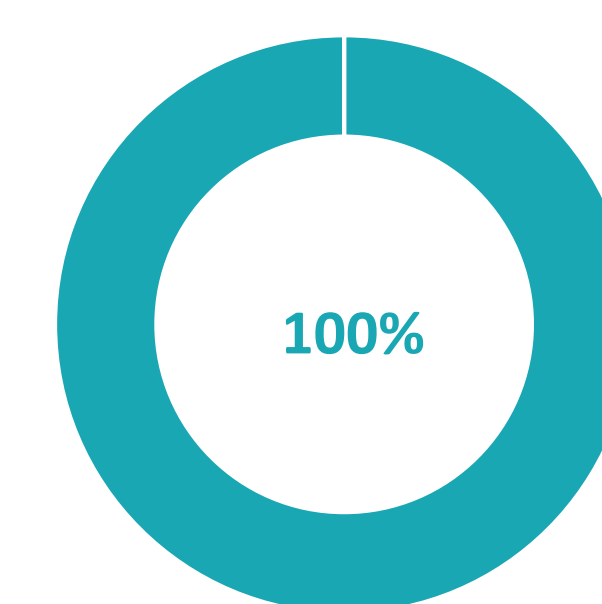
## Results



Participants Who Used Deterra Pouch



Participants with Expired/Unused Medications at Home Who Used Deterra Pouch



- 39 surveys were returned.
- On a scale of 1 to 5 (1 being difficult and 5 being easy) participants rated the Deterra Pouches with a mean score of **4.24** in ease of use, with a standard deviation of **1.10**.
- **35.3%** of participants had expired/unused medications at home.
- **100%** of participants who reported that they did not have expired/unused medications at home also responded that they did not use their Deterra Pouch.

## Conclusions

- More 'Meals on Wheels' participants utilize the drop box disposal locations than compared to the general population of the Wausau Metro Area aged 18+ (**58.1%** vs. **47%<sup>4</sup>**)
- Deterra Pouches, if provided, have a very high likelihood to be utilized, and are very unlikely to sit in participants homes unused if they have expired/unused medications. Hence, Deterra Pouches may be a worthwhile allocation of funds in the future.
- Deterra Pouches are an effective method of prescription medication disposal among the aging and/or disabled population with expired/unused medications in their home when considering perceived ease of use.
- 62.9% of participants reported that they did not use their Deterra Pouch. However, since 100% of these participants also reported that they did not have expired/unused medications at home, it can be concluded that the lack of Deterra Pouch use can be attributed to participants who did not own expired/unused medications.

## Future Directions

- For the 2020 grant year, the Marathon County Health Department received additional Deterra Pouches that can be used to further this project and/or for other areas of distribution.
- Consider incentivizing surveys to increase return rate.
- Since **41.9%** of participants disposed of their expired/unused medications in a way that may be harmful to the environment, themselves, or others, continuing education on safe disposal practices among this population should be considered.



## Acknowledgements

Special thanks to:

- Melissa Moore - Marathon County Health Department/AOD Partnership
- Ronda James, RD - Aging and Disability Resource Center of Central Wisconsin
- Meals on Wheels drivers

## References

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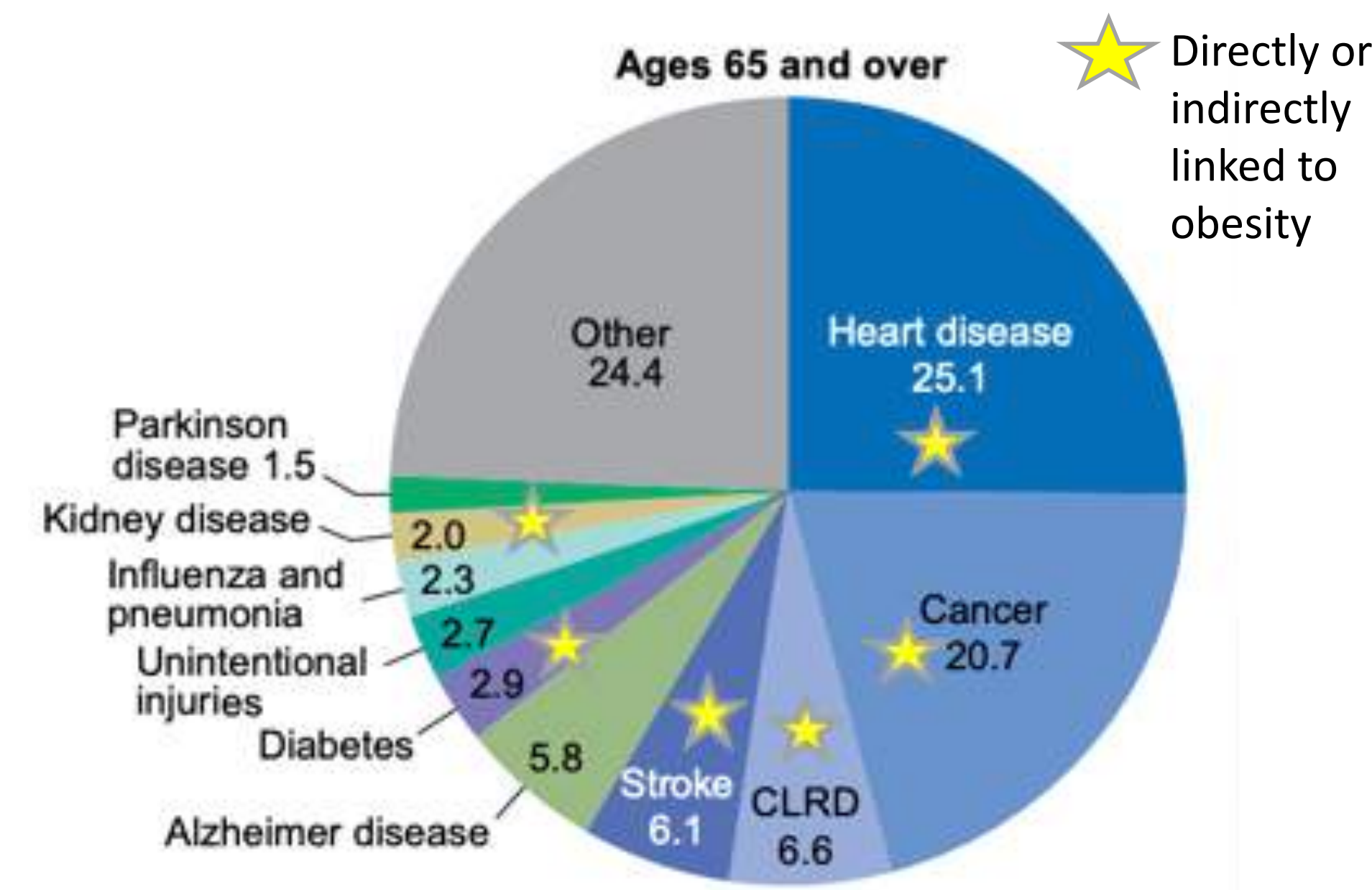
# Geriatric Perceptions of Weight and Weight Loss in a Primary Care Clinic

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## Background

- Both obesity and the number of people over the age of 65 continue to rise in the United States.
- By 2060, the number of U.S adults over the age of 65 is expected to double.
- By 2030, the national prevalence of adult obesity is expected to rise to 48.9% from 44.8% in 2018.
- Both obesity and aging contribute to increased health services, putting an augmented financial strain on our health system.
- Obesity has shown significant links to several leading causes of death in people aged 65 and older.

Figure 1. Percent distribution of the 10 leading causes of death, by age group: United States, 2017



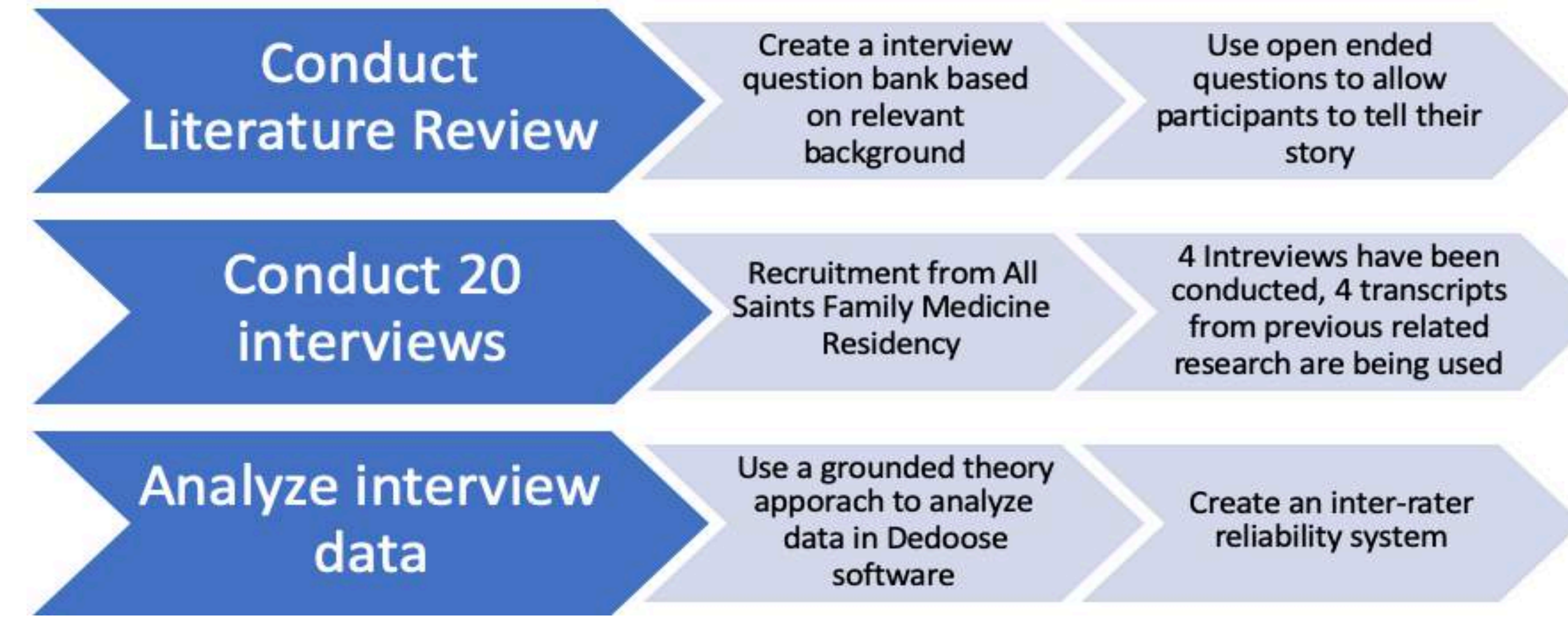
CDC National Vital Statistics Reports; Deaths: Leading causes for 2017

- In order to provide necessary care for obese elderly patients as well as help prevent the future strain on our healthcare system, providers must understand the factors that influence weight in a geriatric population.

## Aims

Through examining elderly patients' perceptions of the way in which the aging process impacts weight, we will develop a model to better support patients in a clinical environment.

## Methods



## Results

### Demographics:

**Age:** 65-79, M: 70.625\*  
**Race:** 2 Caucasian, 2 African American  
**Gender:** 6 female, 2 male\*  
\*data incorporates 4 transcripts from previous research

### Social Factors:

**Living status:** 2 lived alone, 1 lived with husband, 1 lived with daughter  
**Relationship status:** 1 divorced, 1 married, 1 single, 1 widowed

### Influence of Age:

1. Amplified with age
2. Changes in perceptions over time
3. History with food
4. History with weight
5. Physical activity and aging
6. Weight changes

*"They say that walking is the best exercise for just about everything. But we can't always walk in this climate. If it's icy out I can't walk because of my balance."*

### Patient Context/Personal Perceptions:

1. Comfort in discussing weight
2. Coping strategies
3. Diet modifications
4. Emotional Connection to weight
5. Eating habits
6. Motivating factors
7. Perception of food
8. Physical activity habits
9. Temptation/ self-control

*"My daughter [is my motivation]. I've got one child and I got her at a late age, I was 50 when she was born. I want to be able to see her life. I want her to understand not to gain the weight like I did."*

### Themes

#### External Context/ Social Influence:

1. Comparison to others
2. Barriers
3. Factors affecting weight/diet
4. Influence of COVID-19
5. Perceptions of normal/weight loss
6. Social Influences
7. Triggering circumstances

*"Food is a big part of our lives, it's a big part of socializing and a big part of every day. No matter who you're with someone will say 'do you want a piece of cake or a cookie' or 'let's get together we'll have a meal at the community room tonight'"*

#### Health Influences

1. Health Literacy
2. Connection between health and weight
3. Clinician relationship
4. Advice
5. Weight management approach

*"I have a lot of back problems and I know a lot of it is due to my weight and I would feel better with my back and legs if I would lose some weight. I have high blood pressure and cholesterol so [losing weight would help with that too]."*

*"I want to be healthy. Healthy is my motivation"*

## Discussion

- Preliminary results show that elderly patients' perceptions of weight fall within 4 major themes: the influence of age, patient context, external context, and health influences.
- The connection between health and weight becomes more prevalent as one ages
- Health literacy and comfort using technology play a large role in a patient's ability to self-manage their diet
- Participants expressed interest in learning how the physiology of aging affects their body and weight

*Q: What advice would you give your physician?*

*A: "I guess talk more about the changes of your body as you get older and the different things you need to do to maintain weight and be healthier"*

- Currently the largest limitation is the small data set

## Future Work

Expand interview pool to include health providers caring for elderly patients. In doing this we will be able to better understand what influences weight management from a clinical standpoint.

## Acknowledgements

Thank you to Dr. Ruffalo for her mentorship and the National Institute On Aging for funding this project under Award Number T35AG029793.

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## Introduction

Community-academic partnership with Eras Senior Network, the ADRC, and Froedtert Health to improve support for unpaid family caregivers of elderly adults

Caregivers who navigate complex, multi-specialty care often need support

Aim: explore provider perspectives on the role of medical professionals to ensure the caregiver is considered in patient's care

## Methods

**Participants:** purposeful sampling of medical professionals who regularly interact with elderly patients

**Study Design:** qualitative interview study

1. Semi-structured virtual interviews and demographic survey
2. Interviews were audio recorded and transcribed verbatim
3. Open coding of transcripts using Dedoose to identify codes and develop themes

## Results

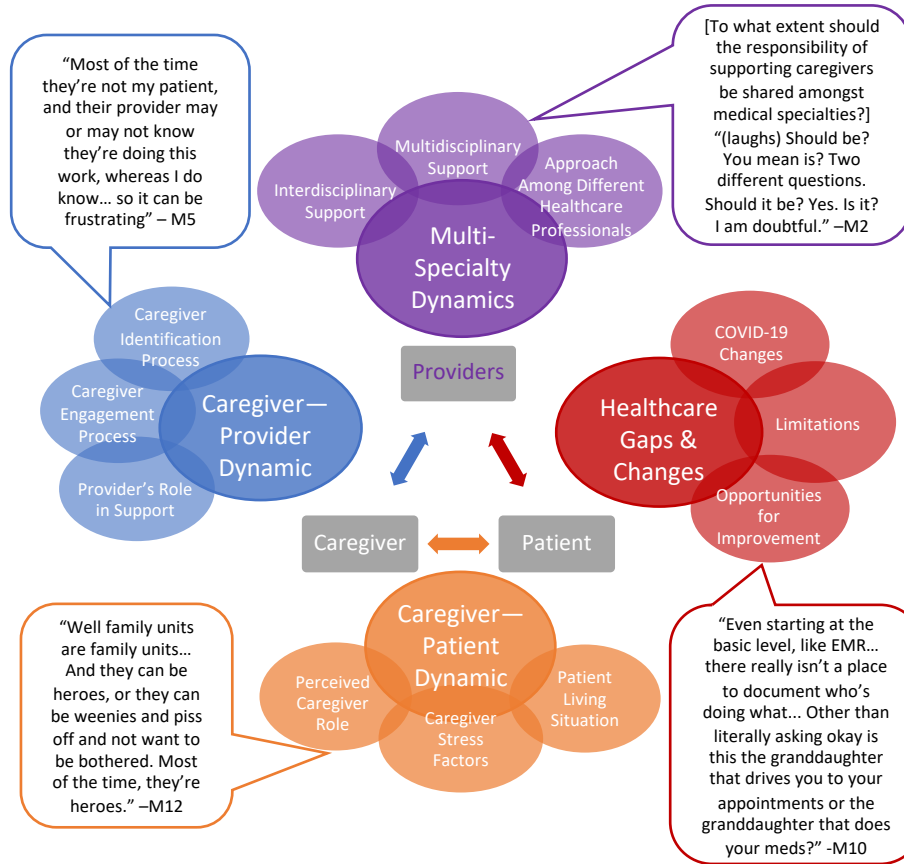
### Participant Demographics (N=12)

Gender	67% female 33% male
Years of Experience	Mean: 16.9 years Range: 1-42 years
Specialty	50% primary care 25% geriatrics 25% PM&R, Neurology, SAR
Personal Caregiving Experience	75% yes 25% no

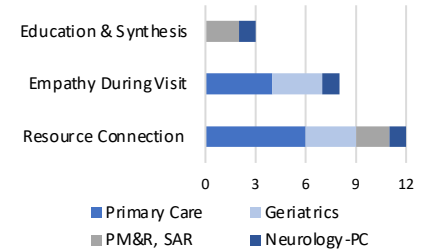
Mean interview duration: 33.9 min (21.8-70.7 min)  
Pooled Cohen's Kappa = 0.68

## Results

### Factors Contributing to Caregiver Support in Healthcare System



### Caregiver Support Strategies by Specialty



## Discussion

Caregiver support is not equitably shared amongst medical professionals; widely understood to be primary care or social worker responsibility

All providers understood their role to include connecting caregivers with hospital personnel and/or community resources, additional roles less consistent

Limitations for support include time constraints, inter- and intra-specialty communication, billing, insurance coverage and professional boundaries

Unanimous agreement for systemic changes, nature of changes was variable

Study limitations: small sample size and semi-structured interview style limit generalizability of results

## Next Steps

Conduct interviews with caregivers to investigate how perceptions differ from that of medical professionals

Explore system changes that best support family caregivers, patients and providers

## Acknowledgments

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# Brain is Time

Tim Guthrie MS2 and Aboudi Mounir MS2

## INTRODUCTION

- Strokes are the 5<sup>th</sup> leading cause of death in America and up to 80% are preventable
- Stroke results from lack of blood to the brain (Hemorrhagic and Ischemic)
- Without oxygen the brain cells will quickly begin to die resulting in potential lifelong deficits (paralysis/loss of muscle movement, difficulty talking and memory loss)
- With this in mind, it is essential that the community is aware of this disease and understands both the symptoms that present with stroke and the predisposing factors that puts individuals at greater risk.

## PURPOSE

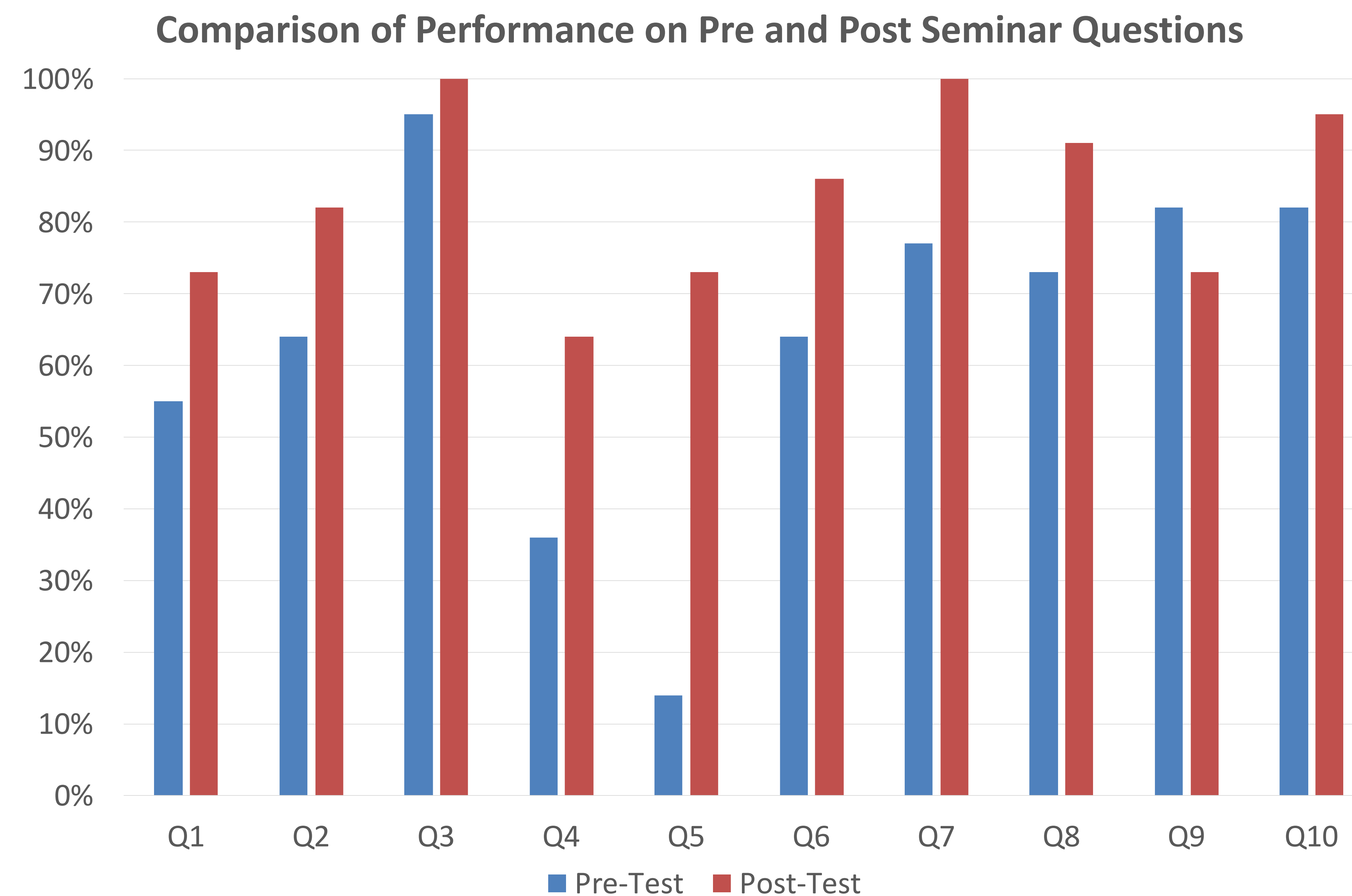
Our goal for this project is to educate the Brown County population on basic stroke prevention and detection so that strokes can be caught early on. Studies have shown up to 80% of strokes are preventable with early recognition and intervention. We conducted a presentation on signs, symptoms, and risk factors for strokes in hopes that we help people learn how to identify and prevent a stroke. Having this information in your back pocket could save a life one day.

## METHODS

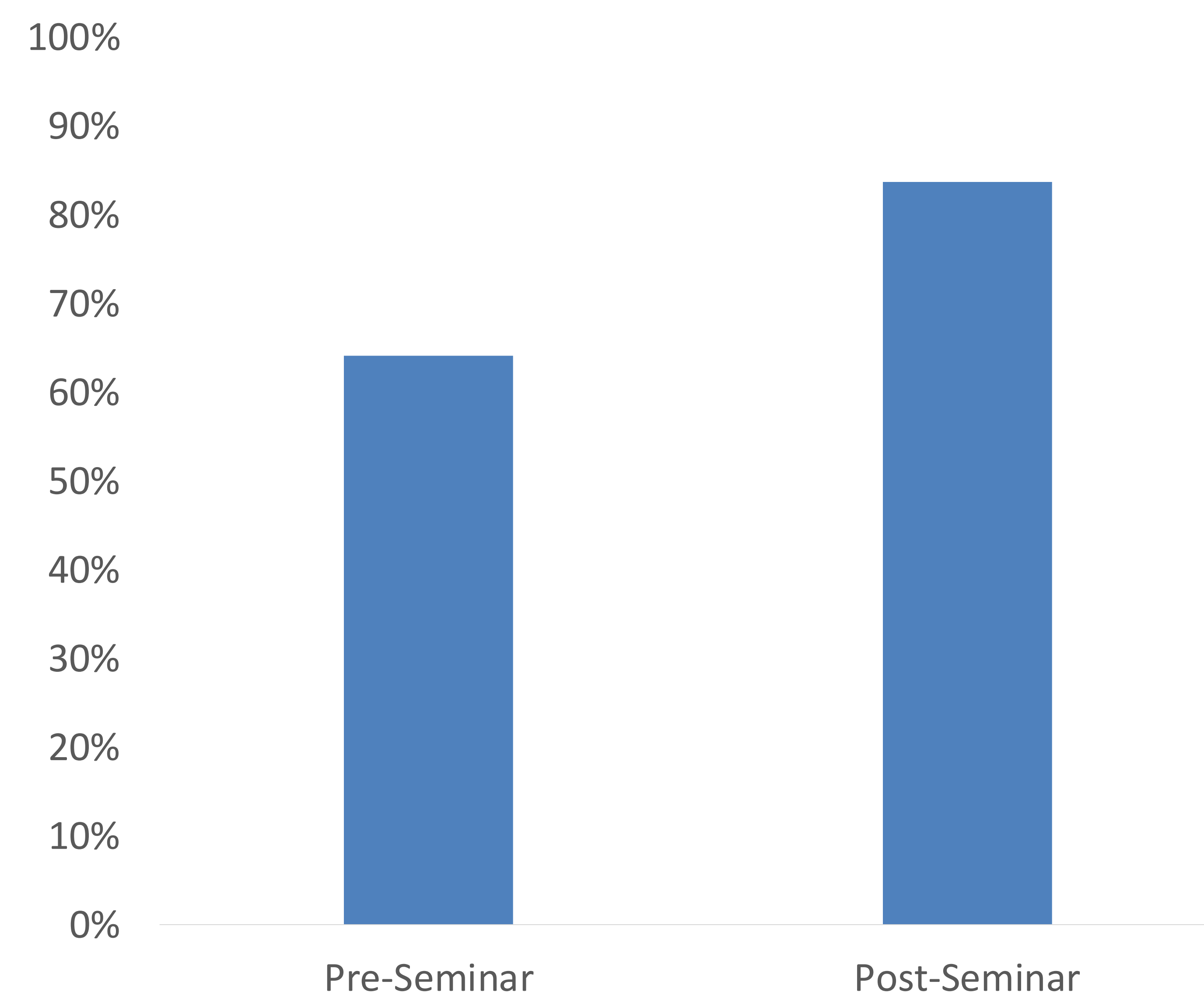
- Our project had two presentation dates that were advertised in the local community
- Pre and post presentation surveys were created to assess understanding of the content and check for statistically significant improvement in scores
- Pre and post surveys were labelled with matching numbers to avoid using personal medical records or other personal identifiers
- Project was limited to those that can read English

## RESULTS

22 members of the ADRC were our participants for this study. They completed pre and post surveys. Survey performance is demonstrated via the figure below.



Comparison of Overall Performance



We then compared the overall performance change on the 10-question test. Mean test scores rose from 64% (pre seminar) to 84% (post seminar). Statistical analysis using a paired t-test computed a p-value of 0.0063 meaning there was a statistically significant difference between the two groups.

## CONCLUSIONS

- Prior to seminar, stroke awareness among participants of the ADRC was higher than expected
- The average of our pre-test scores was 64%, demonstrating the high baseline knowledge of participants
- Although baseline knowledge was high, every participant left with new knowledge (demonstrated by an increase in test scores)
- The average of our post-test scores was 84%, demonstrating an increase in knowledge of participants after the seminar
- There was a statistically significant difference (p-value = 0.0063) in the test scores when comparing baseline knowledge to post-seminar knowledge
- There was an increase in confidence in stroke situational awareness expressed by participants of the ADRC

## FUTURE DIRECTIONS

- Our goal is to continue our partnership with the ADRC to provide similar stroke awareness talks and attempt to reach a broader population within Brown County
- Future studies could aim for a larger population to make the results more statistically significant

## ACKNOWLEDGEMENTS

- We would like to thank everyone at the ADRC for their support throughout this project

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# Assessing the Efficacy of Pre-Hospital Providers in Correctly Identifying Cerebrovascular Accident in De Pere & Ashwaubenon WI- A Retrospective Analysis

Patrick D. Best and Jayme S. Nelson

## INTRODUCTION

Stroke, or cerebrovascular accident (CVA), has long been a significant cause of morbidity and mortality in mammalian species. Because of its insidious nature and acute presentation, it is a silent killer that places a large amount of financial and labor burden on the healthcare system in this country.

A CVA simply means that because of some mechanism, the brain is no longer getting the right amount of blood flow. There are two main types:

- Ischemic stroke, in which an embolus occludes portions of the blood vessel distal to the catch point. (85% of CVA's)
- Hemorrhagic, in which the patient has a ruptured blood vessel in the cerebral tissue, lessening blood delivery to tissues distal to the bleed. (15% of CVA's)

CVA's often cause sensory and motor defects, as well as altered mental status and occasionally death.

There have been vast improvements in the field lately, including:

- Mechanical thrombectomy (MT)
- Thrombolytics
- Imaging modalities
- Rapid identification of strokes because of pre-hospital stroke scales
- FAST ad campaign

Earlier treatment, solid handoffs between providers, and history taking are all known to be important determinants of positive vs. negative outcomes in CVA patients.

However, there is still the question of how efficiently we are identifying strokes in vivo as they are occurring.

This study is seeking to establish how efficient the LAMS prehospital stroke scale is at identifying CVA's in our community.

## Purpose

We are proposing the present study to investigate the efficacy of the LAMS Assessment Tool in identifying CVAs in the prehospital setting in both De Pere and Ashwaubenon Wisconsin in recent years. Our goal is to either:

- Determine that the LAMS score is accurately identifying CVA's
- Determine that LAMS is not accurately identifying CVA's and propose a superior alternative

## METHODS

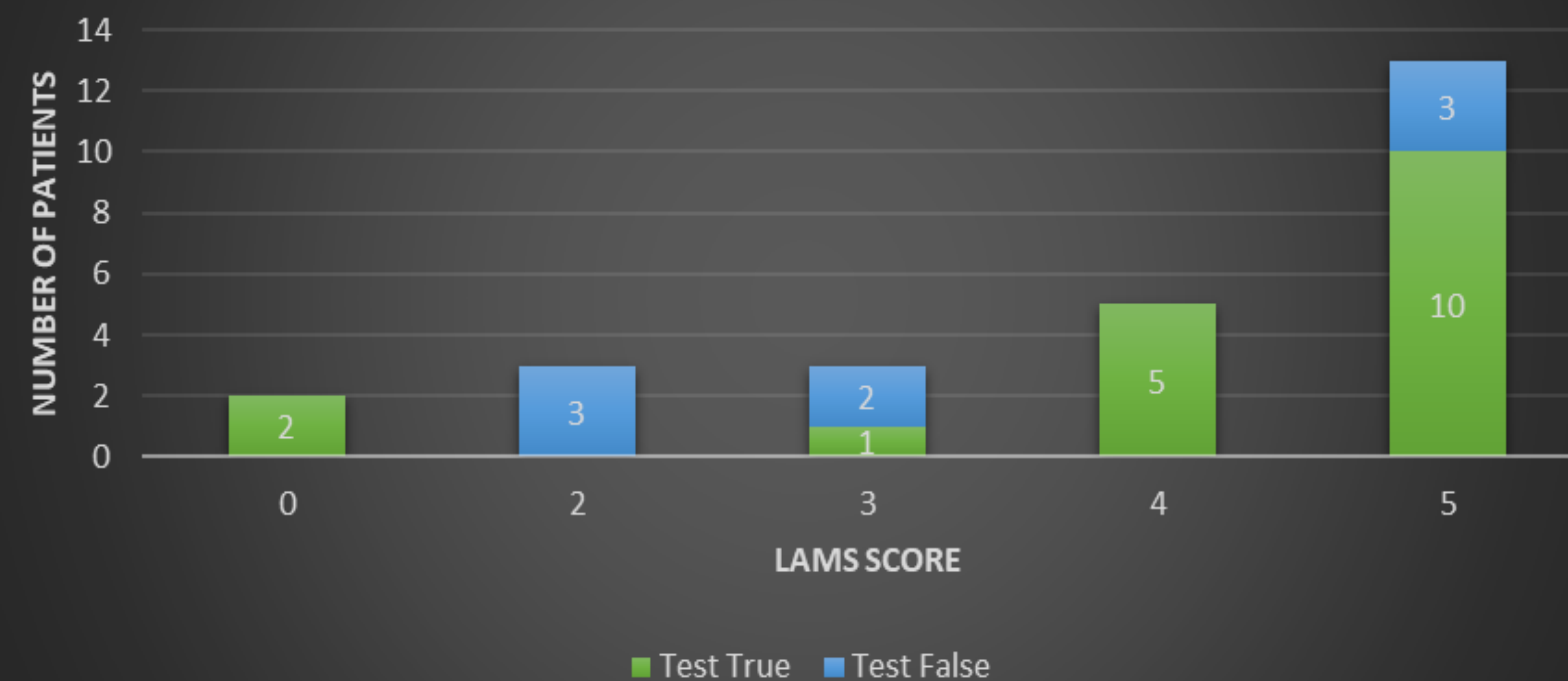
This study was performed in a few distinct steps:

- Pulling deidentified records from De Pere Fire Dept, Ashwaubenon Public Safety, and Aurora BayCare. These records ranged from Jan. 2016-Nov. 2019.
- Look at cases where De Pere Fire or Ashwaubenon Public Safety concluded that a CVA was the patient's primary MOI/NOI, **and** transported them to Aurora BayCare Medical Center.
- Determine how many of those suspected CVA's were confirmed via imaging studies. By following patients and linking the EMT's initial impression with the M.D.'s final diagnosis, we can gain an appreciation for the accuracy of prehospital CVA evaluation tools.

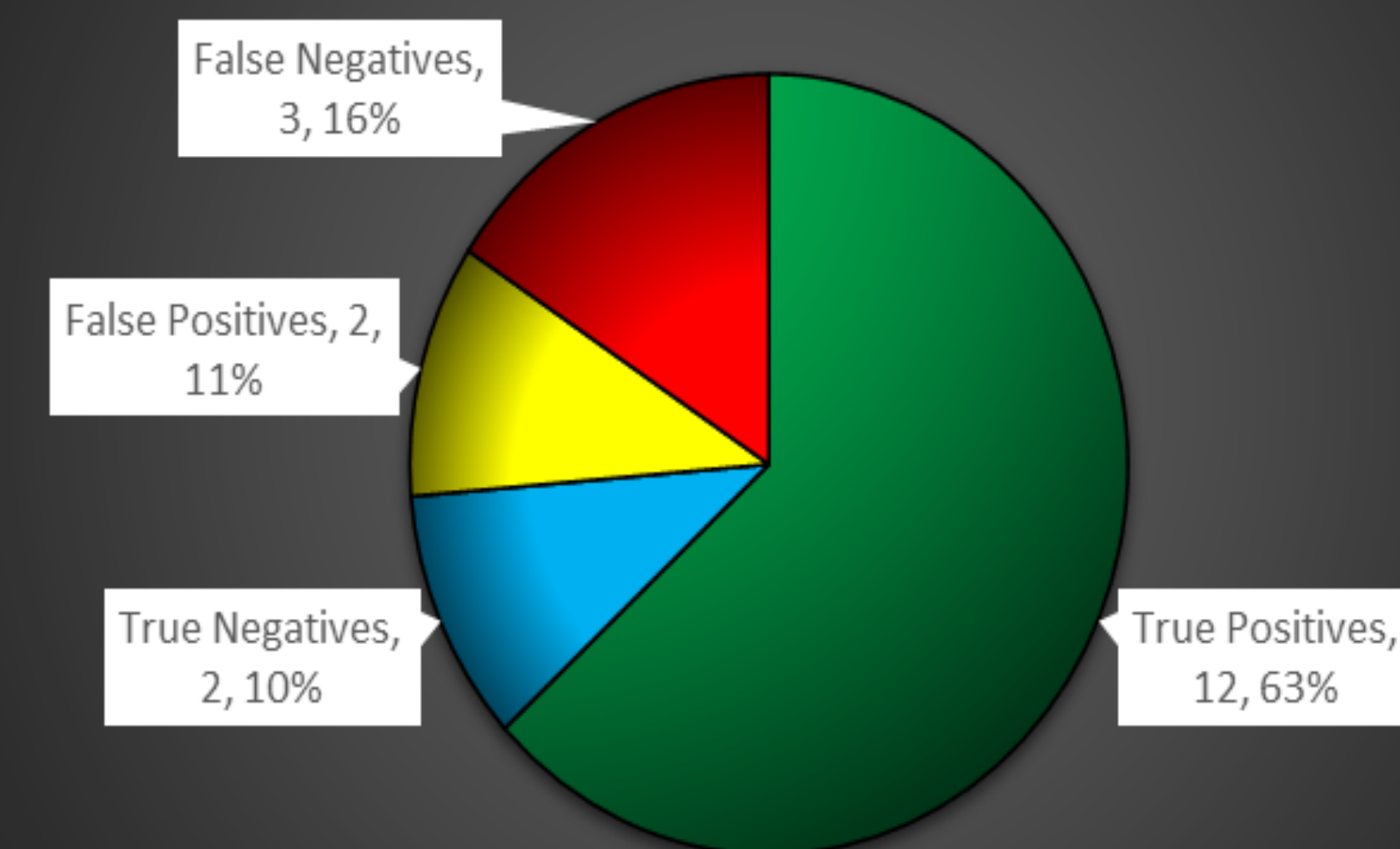
Patients will **only** be included if they were suspected to have a CVA by De Pere Fire or Ashwaubenon Public Safety. They are automatically excluded if CVA was not the primary impression of the EMS crew, or if they were transported to a facility with which we do not have a records release agreement.

## RESULTS

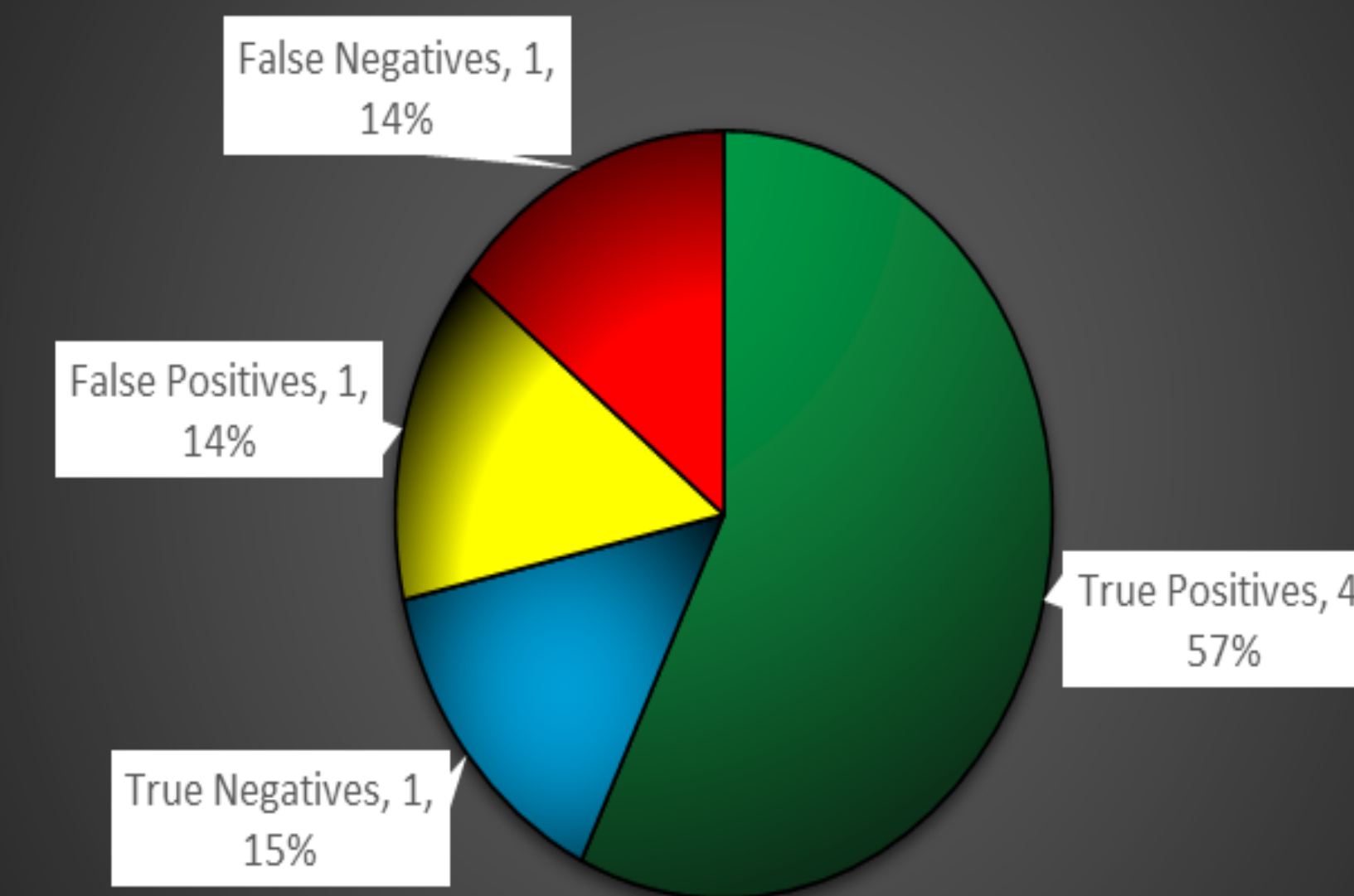
### Test Accuracy by LAMS Score



### De Pere Patients: n=19



### Ashwaubenon Patients: n=7



		CVA		PPV	NPV
		Positive	Negative		
Test-LAMS	Positive	16.0	3.0	84.2%	
	Negative	4.0	3.0	42.9%	
		80.0%	50.0%		
		Sensitivity	Specificity		

## CONCLUSIONS

- It is important to note that the LAMS tool was originally designed for a more precise role of detecting large vessel occlusion (LVO) ischemic strokes. We have expanded the scope of our interpretation to include all instances of cerebral hypoperfusion (ischemic and hemorrhagic events) to be in line with the clinical judgment of EMS professionals, as this was a major aspect of our inclusion criteria. This step was taken because ischemic and hemorrhagic CVA's cannot be differentiated solely by clinical exam findings.
- EMS clinical judgment confound:
  - Only patients who were deemed likely to be having CVA's by EMS personnel were included in this study. As a result, patients representing true negatives may have been excluded. Inclusion of these patients would increase the specificity of the test.
  - Additionally, some true positives are also left out as a result. Namely, patients with positive LAMS results but who were deemed unlikely to be having a CVA by EMS personnel who were brought to a facility other than Aurora BayCare Medical Center and were found to be having a CVA.
- LAMS scores of 4 or 5 are deemed positive for severe stroke (LVO likely) that requires acute treatment. LAMS scores of 0-3 are deemed positive for mild or moderate stroke (LVO less likely) that may benefit from acute treatment.
  - For the purposes of this project, we have defined a Positive Test as a 4 or 5 LAMS and Negative to be <4, in order to align best with the clinical confidence of the test.
- The LAMS data that we collected from De Pere and Ashwaubenon Public Safety was very similar to the national data that has been collected in the past.
  - The pre-hospital stroke identification protocols for De Pere Fire and Ashwaubenon Public Safety were developed by the same medical director and instituted at the same time. Interestingly, the two departments LAMS outcomes were very similar to each other.
- Sensitivities for the LAMS scale are projected nationally at 81%; in our data it was 80%. Our calculated specificity value was low due to our small number of data points (6) that went into that formula, with only two true negatives included, a factor that can be explained by the EMT's clinical judgement.
- We discovered that the positive predictive value (PPV) of LAMS was considerably higher (84.2%) than the negative predictive value (NPV, 42.9%). This is important to keep in mind when interpreting the results of the LAMS assessment tool in the pre-hospital setting.

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