Population Health Research Institute (PHRI) Seminar Series

Students Teaching Students About Stroke

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Chair, MH Department of Neurology
Vascular (stroke) neurologist & medical director of MH stroke programs

Friday, January 7, 2022
9:00 – 10:00 am

Acknowledgements and Team Introduction

PHRI Faculty, Staff & Grant Application Reviewers

Teaching Program & Study Staff

Julie Fisher MHA, BSN, RN
Project Lead Ohio Coverdell Stroke Program

Alice Liskay, MPA, BSN, RN
Nurse Consultant, Ohio Coverdell Stroke Program

Steven Lewis, MPH
Biostatistician

Maria Pry, MSOL
Research Assistant

Lincoln West HS Collaboration Team

Tiffany Short, MS, SPHR
Director, Culture and Organizational Effectiveness

Salethia Coles
Secondary Education Specialist

Goals for the Presentation

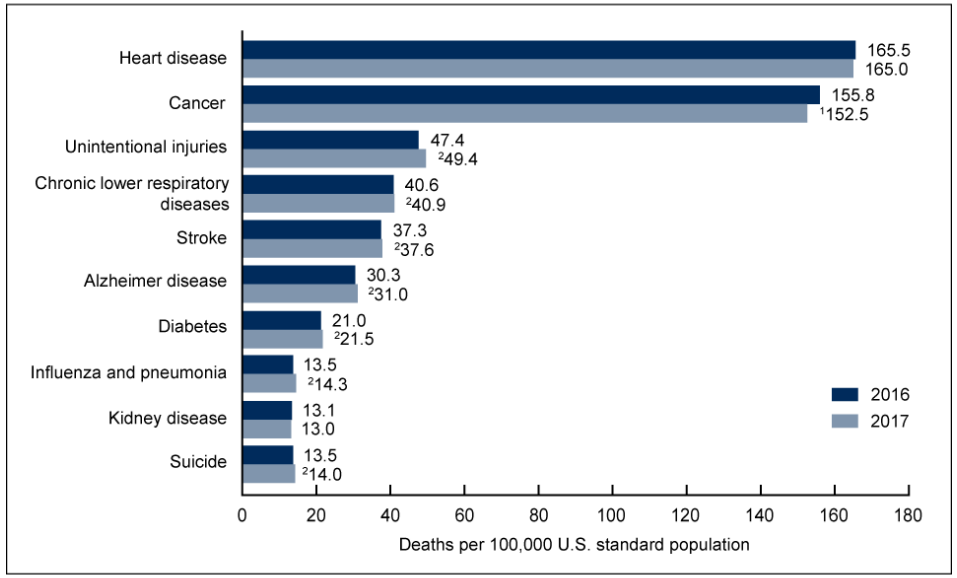
- Outline
  - Stroke
  - Stroke literacy, stroke preparedness, and changing people's behavior
  - Teaching kids about stroke
  - Kids as teachers
  - Design of our study

- My goal: to solicit ideas from this expert audience to improve our approach/analysis and design of the subsequent project

Stroke in the US before COVID

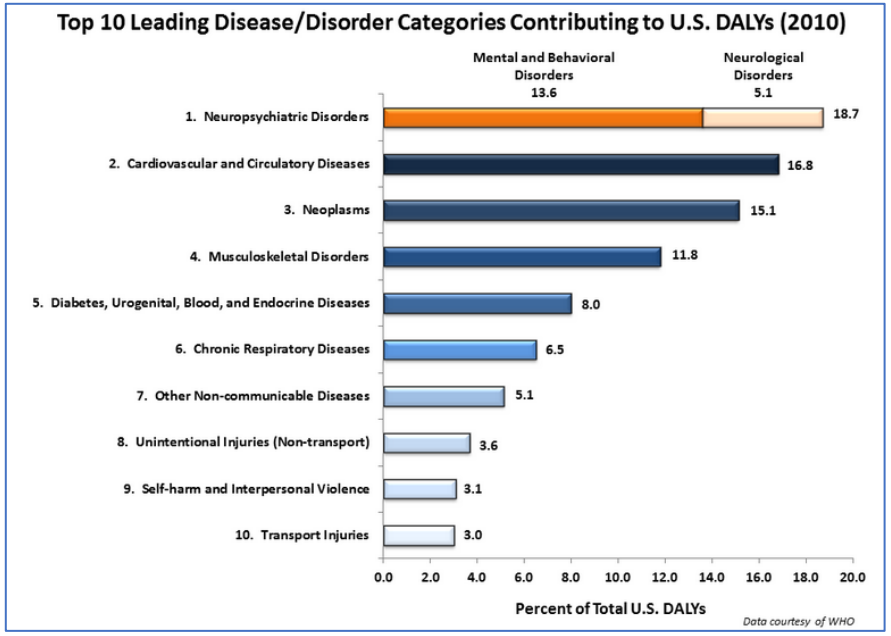
Stroke mortality in US, per the CDC

Figure 4. Age-adjusted death rates for the 10 leading causes of death: United States, 2016 and 2017



[1]Statistically significant decrease in age-adjusted death rate from 2016 to 2017 ($p < 0.05$).
[2]Statistically significant increase in age-adjusted death rate from 2016 to 2017 ($p < 0.05$).
NOTES: A total of 2,813,503 resident deaths were registered in the United States in 2017. The 10 leading causes accounted for 74.0% of all deaths in the United States in 2017. Causes of death are ranked according to number of deaths. Rankings for 2016 data are not shown. Data table for Figure 4 includes the number of deaths for leading causes. Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db328_tables-508.pdf#4.
SOURCE: NCHS, National Vital Statistics System, Mortality.

Disability-adjusted life years in US, per WHO



- 31 percent of stroke survivors need help caring for themselves
- 20 percent need help walking
- 16 percent are institutionalized
- 71 percent are vocationally impaired after 7 years

American Heart Association, 2009

Stroke costs the United States an estimated **$34 billion** each year. This total includes the cost of health care services, medicines to treat stroke, and missed days of work. (CDC)

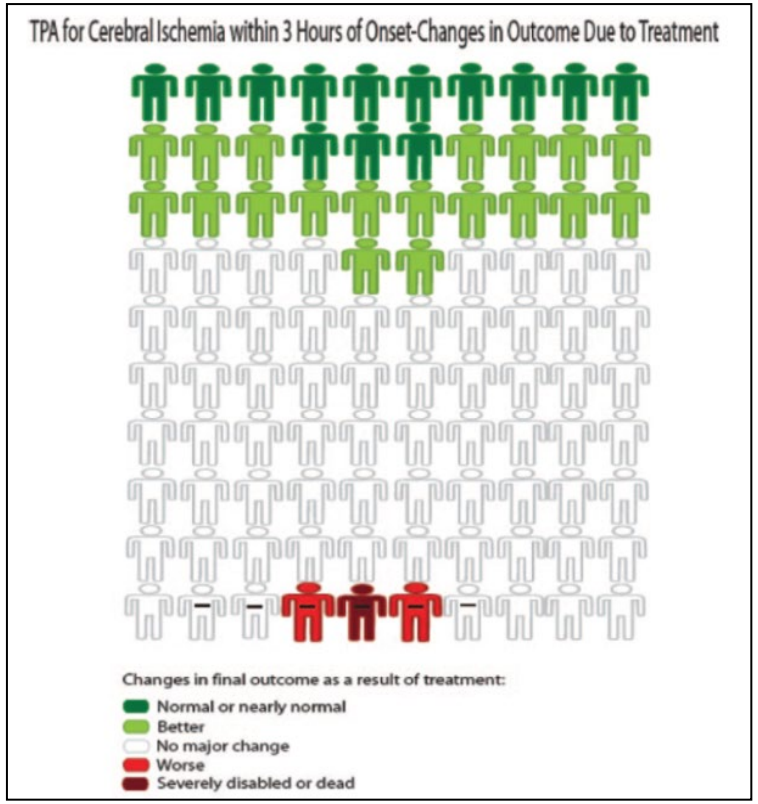
Intravenous tissue plasminogen activator

Stroke

- Sudden, spontaneous onset of neurologic dysfunction (most of the time WITHOUT pain)

- After evaluation, most of the time the cause is arterial blockage resulting in ischemia; hemorrhage due to arterial rupture is the cause in a small proportion of patients

- Stages of ischemic stroke care
  - Primary prevention
    - Identification and mitigation of risk factors: most commonly hypertension, diabetes, hyperlipidemia, smoking, atrial fibrillation
  - Acute management of ischemic stroke
    - Effective treatments that are exquisitely time-sensitive
      - Acute stroke is under-recognized in general but especially in disadvantaged communities -> significant disparities, e.g., lower acute treatment rates in African American women
  - Secondary prevention
  - Rehabilitation



IV tPA given within 3 hours of symptom onset improves functional outcome in **32/100** patients and harms 3/100; between 3 and 4.5 hours, it improves **16/100** and harms 3/100.

Background

- MetroHealth Comprehensive Stroke Center and Acute Stroke-Ready Hospitals

- We would like to improve stroke literacy (risk factors), stroke preparedness (recognizing stroke and calling 911) and change our patients' behavior
- Example: smoking cessation

    - Stroke MDs and APPs start risk factor education in hospital with specific attention to smoking as a vascular risk factor (the smoking "riot act")
        - Initially daily, and then every other day, visits from the stroke team
    - Social work assessment and education on community resources
    - RN stroke education
    - MDs or APPs re-discuss on follow-up in stroke clinic
        - Some have quit
        - Some have "cut down"
        - Some are still smoking at the baseline rate and do not remember why quitting is recommended

Background

- Tran et al., Smoking levels and associations between sociodemographic factors and smoking continuation in US stroke survivors, Annals of Epidemiology 43 (2020) 66-70
  - 20.4% of stroke survivors in the Behavioral Risk Factor Surveillance System database continue to smoke after their stroke
  - Continued smoking increases risk of stroke recurrence
  - Certified stroke centers are mandated to provide education on secondary stroke prevention including smoking

CDC - BRFSS

Background

- What are the most effective approaches to health literacy and sustained behavior change?
  - Patient: understanding, willingness, resources, support
  - Community (family, friends, healthcare team): information, resources, support
  - Method characteristic
    - Focused/"bite-sized" knowledge
    - Multi-modality/multi-contextual presentation
    - Trusted community role models/spokespersons/peers
    - Collaborative/multidisciplinary/interprofessional input
    - Longitudinal/repeated (Repetition is the mother of Acceptance)
    - Individualized/personally meaningful context

- Motivational interviewing
  - *"MI is a collaborative, goal-oriented style of communication with particular attention to the language of change. It is designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person's own reasons for change within an atmosphere of acceptance and compassion."* (Miller & Rollnick, 2013, p. 29)
  - True effectiveness remains to be seen
  - E.g., Frost et al., PLoS One. 2018; 13(10): e0204890.

Understanding Motivational Interviewing | Motivational Interviewing Network of Trainers (MINT)

Background

- Sajatovic et al., A Targeted Self-management Approach for Reducing Stroke Risk Factors in African-American Men who have had a Stroke or Transient Ischemic Attack, Am J Health Promot. 32 (2018) 282-293
  - 38 men, 19 targeted tool vs 19 usual care
  - Self-management training, taught in 1 individualized session and 4 group sessions over 3 months and 7 phone calls over 6 months by nurse educator and peer educator
  - 5 participants in each group did not complete the study (26% drop out)
  - Improvement in some of the studied measures
  - Generally positive impression

Approach: peers; longitudinal/repeated. Main challenge: drop out over time.

Background

- Smith et al., The Arkansas Minority Barber and Beauty Shop Health Initiative: Meeting People Where They Are, Preventing Chronic Disease, Public Health Research, Practice and Policy, vol 17 (2020) e153
  - Minority-owners of barbershops and beauty salons were invited to be sites for CVD risk factor screening
  - Volunteers were recruited and trained as screeners
  - Screening (BP, POC glucose and cholesterol, BMI) and education (heart disease, smoking, stroke, nutrition, physical activity) were provided to participants (1833)
  - Pre-test 60.8 % correct -> post-test 87.6% correct on what to do when someone has stroke or heart attack symptoms, normal BP, normal cholesterol (other similar improvements in knowledge and judgement)
    - Duration of effect unknown
  - Appropriate referrals to clinics and follow up nurse coordinator calls: 28% kept primary care appointment

Approach: trusted role models. Main challenge: robustness and durability of behavior change.

Teaching kids and parents about stroke

- Hip Hop Stroke (HHS)
  - Williams at al., Improving Community Stroke Preparedness in the Hip Hop Stroke Randomized Clinical Trial, Stroke 49 (2018) 972-979
  - 22 schools in NYC, randomized to HHS (intervention) vs nutrition (control) classes
  - HHS = 3 hours of "culturally tailored, theory-based multimedia stroke literacy intervention" aiming to increase stroke knowledge (risk factors) and preparedness (calling 911)

Hip Hop Stroke – Hip Hop Public Health (hhph.org)

- 3,070 4th - 6th graders and 1, 144 parents enrolled
  - 2, 789 kids and 887 were analyzed

RESULTS

- Kids:

Baseline: no difference in knowledge (perfect scores on quiz in 1% of intervention group and 2% in control group)
Immediately after program: 57% perfect scores in intervention group vs. 1% in control group;
3 months after the program: 24% vs. 2%

- Parents:

Baseline: no difference in knowledge (perfect scores in 17% of intervention group and 19% in control group);
Immediately after program: 29% perfect scores in intervention group vs. 21% in control group;
3 months after the program: 24% vs. 21%

Approach: culturally/personally meaningful; multimedia. Main challenges: durability of effect and robustness (parents).

Kids teaching parents about stroke

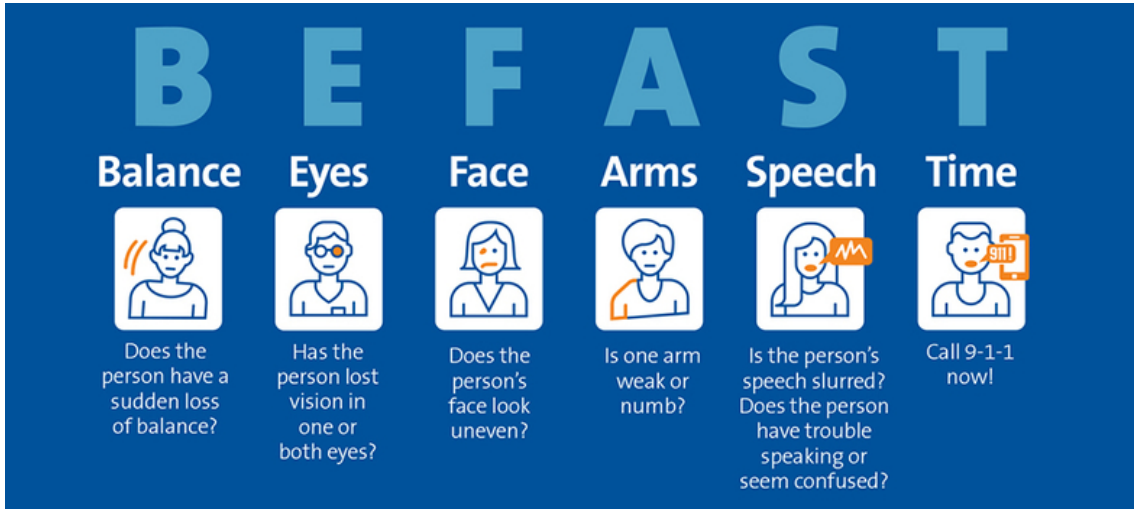
- Tshiswaka et al., Systematic Review and Meta-Analysis of Community Stroke Educational Programs, J Stroke Cerebrovasc Dis 27 (2018) 3187-3199
  - Studies of child-mediated stroke communication
  - 9 cross sectional studies and 2 randomized controlled trials
  - School setting (public or private)
  - 20 to 50 - minute educational interventions using a variety of methods
  - Knowledge checked at baseline, immediately after the lesson, and at 3 months
  - Correct answers regarding risk factors: 0.686 -> 0.847 -> 0.845 in parents
  - Results similar for calling 911

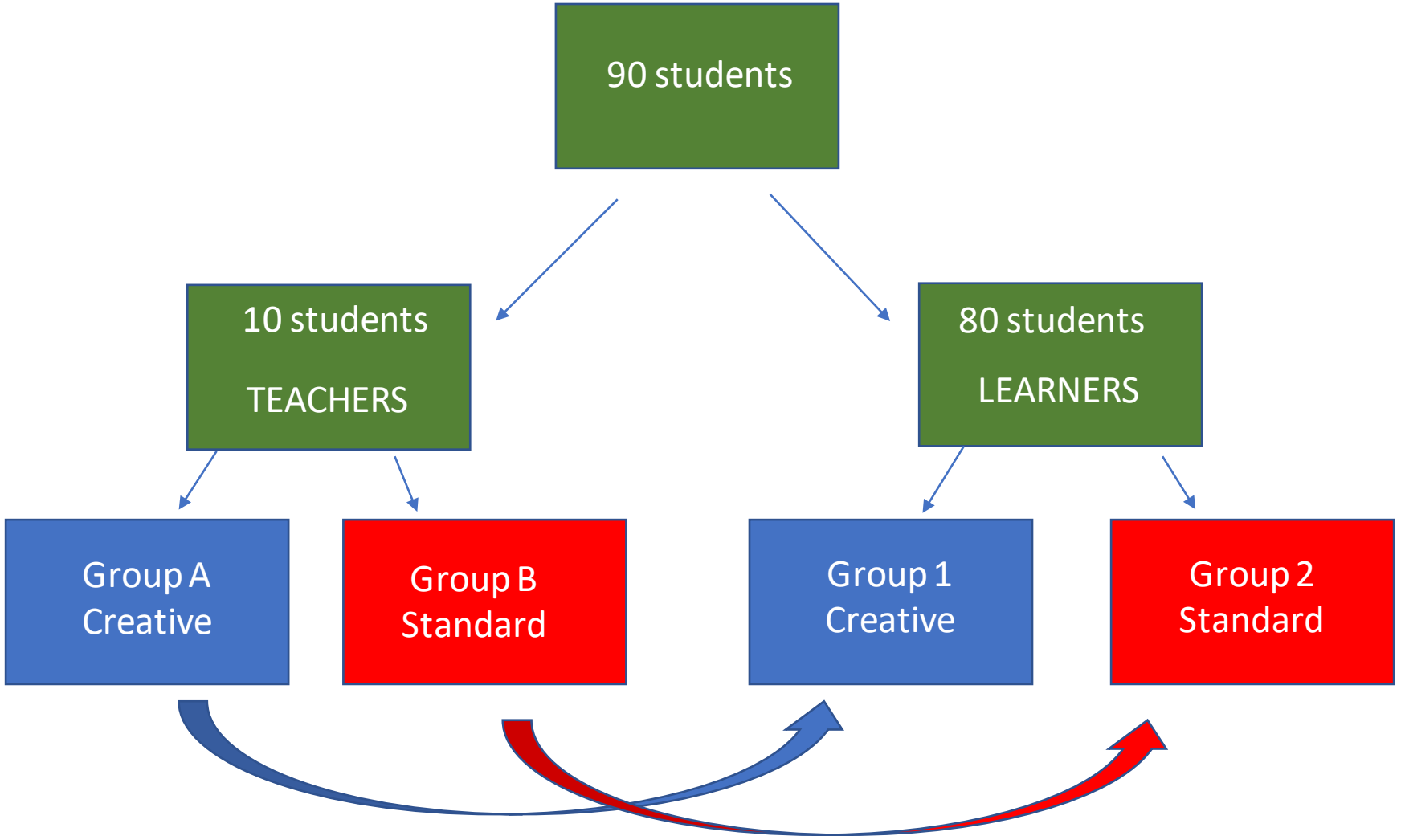
Main challenge: parent drop out over time.

Main ideas from sampled studies: 1) kids may be better learners; 2) durability is a big challenge.

MH Students Teaching Students About Stroke

- Who
  - Lincoln West HS students, approximately 90 11th and 12th graders
- What
  - Project to:
    - Increase stroke literacy and preparedness
    - Teach students to teach peers
    - Assess two different peer teaching methods
- Why
  - To decrease barriers to acute stroke care and primary prevention
- When
  - Winter and spring semester 2022
- Where
  - MetroHealth/Lincoln West HS





Design features

- Leverages existing urban hospital –high school collaboration
- Part of healthcare curriculum
- Credit toward graduation
- Teaches students to teach peers and work in ad hoc teams
- Compares two different teaching methods, creative (which may be more personally relevant for learners) vs. standard
- Ranking of student teachers and learners by GPA*
- Pre and post testing
- Delayed testing

Originally designed as a cross-over study with two topics taught longitudinally and groups A and 1 switching from creative to standard (and vice versa for groups B and 2) for the second topic, but the design had to be modified due to COVID.

Project Details

Grade point average (GPA)

- Studied in university students rather than HS students
- Encompasses multiple elements, intrinsic and extrinsic
  - Aptitude
  - Parenting
  - Schools/teachers
  - Social determinants of health
- General measure of academic performance as well as test-taking strategies
- Decided to create teaching teams balanced by GPA
  - Disrupts cliques
  - Includes high and low performers which broadens the experience and improves performance
  - Models real-world workplace teams

March 9, 2022

Introduction of project to all students:
Taught by Dr. Ardelt, A Liskay, J Fisher

Project Overview

- Project expectations/commitment/benefits of participation
  - Stroke literacy as part of overall health literacy
  - Learn to teach
  - Credit toward graduation
- Identification of student teachers

Week March 21

Final Preparation: study staff

- Finalize groups
- Send Power Points to LW Health/Bio teachers/Tiffany and Salethia
- Finalize pre and post tests

April 11, 2022

Taught by Julie Fisher

- Quick review
- Pre-test
- Anatomy/Physiology/ Stroke Subtypes
- Post-test
- Review Post-test answers
- Q&A

April 13,2022

- Taught by Dr. Ardelt
- Quick review
- Pre-test
- Risk Factors/ SDOH
- Post-test
- Review Post-test answers
- Q&A

April 18, 2022

Taught by Alice Liskay

- Quick review
- Pre-test
- S & S /911/TX
- Post-test
- Review Post-test answers
- Q&A

April 20, 2022

Taught by Julie Fisher

- Quick review
- Pre-test
- Teaching Techniques
- Post-test
- Review Post-test answers
- Q&A
- Homework: effective teaching method + tools

April 25, 2022

Taught by Fisher and Liskay

- Review Teaching Techniques
- Group work for presentation/ coaching
- Split subject matter – student homework
- Access to video/media

April 27, 2022

Taught by Study Team

- Group Practice and Coaching/ Feedback
- Final Details

May 6, 2022

Taught by Dr Ardelt, Julie Fisher and Alice Liskay

- Teaching sessions
  - Group A and Group 1 to R170 for education
  - Group B and Group 2 to East dining room for education
    - Teachers administer pre- test
    - Teachers teach learners
    - Teachers administer post-test
- All students back to East dining room
  - Students break into groups for stroke experience stations: arm restraint; wheelchairs; walker; leg splints; eye patch; non-verbal communication
  - Stroke panel: EMS; ED nurse; Dr Ardelt; CT tech, Pharmacist; stroke nurse; PT/OT/Speech . SW, Care partner/STNA

Date TBD

Taught by Julie Fisher and Alice Liskay

- Closure with students
- Evaluation of the project by student teachers and learners
- Results of pre and post-tests
- Overall results of project
- Post-test with all students (delayed testing)
- Suggestions for next steps
- How would you approach teaching your family and community?

Sessions, Students and Data

- Teaching sessions
  - 45 minutes
- Pre and post tests
  - 5-10 questions
  - Method and tracking to be determined (e.g., paper vs. phone/tablet with QR code)
- Students
  - List of participating students with names, limited demographics, and GPA will be provided to MH by LWHS as part of the teaching program
  - List will be managed by LW Collaboration Team (S. Coles, T. Short)
  - Study personnel (A. Ardelt, A. Liskay, J. Fisher, S. Lewis, M. Pry) will be blinded to student's GPA and demographic information
- Group and subject identifier assignment
  - Teachers and learners
  - Groups balanced based on GPA rank by LW Collaboration Team
  - Each student (subject) assigned a unique study number for testing purposes and data analysis
    - GrpA-1, Grp2-1, etc
    - Study personnel will be blinded but S. Lewis will be given access to demographic data associated with each subject number

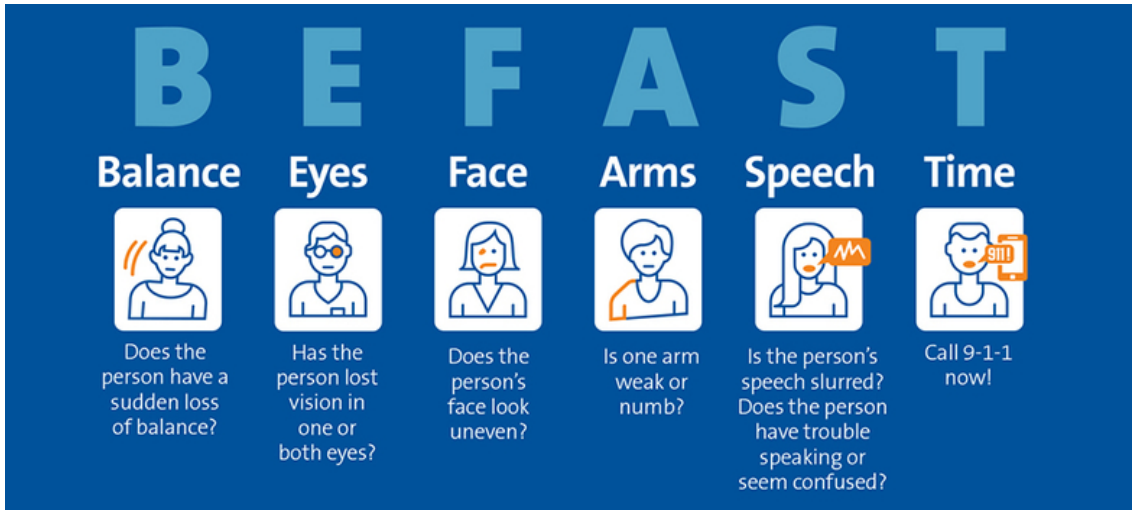
- IRB approval for the study component is pending

Data Analysis Plan

- Evaluate pre-post change in content knowledge/skills
  - Compare mean differences in test scores by 2 teaching methods
  - 40 Learners per Group
  - Power ≥ 90% to detect a mean difference of 2, assuming standard deviations of 1 in each group and a correlation of 0.3 between responses in each group.
- Adjust for differences in student teachers among the 2 groups of learners
  - Evaluate if trend to better retention over time in the student teachers
- Overall results will be examined by Grade (Junior/Senior), Gender, and GPA

Next Steps

- If successful, make program available to other Cleveland schools for the following school year
- Next project
  - Students teaching in the community
  - Ideas from audience
- Questions/comments



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Thank you

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