Arizona Health Education Centers
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Poster Presentation

Community Assessment - The Hopi Tribe

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ABSTRACT

The assessment was conducted to evaluate health, economic, and social issues facing the Hopi Community. The study utilized various data collection techniques, including surveys, focus groups, interviews with tribal members, and site visits. The findings highlight both the strengths and challenges within the community, particularly regarding healthcare access, economic stability, infrastructure, and cultural preservation.

INTRO

The Hopi Reservation, located in northern Arizona, spans approximately 1,625,686 acres and features a landscape of rocky sandstone formations, natural springs, and mesas that hold deep cultural significance ("Welcome to the Hopi Tribe", n.d). A windshield survey revealed significant public safety concerns. Home infrastructure, lack of sidewalks and street lighting, unpaved walking trails all pose safety risks, particularly in main villages where some homes lack essential utilities such as running water and electricity (Becenti, 2024). These safety issues lead to fall risk and increased falls in older adults, which may be detrimental to their health (Centers for Disease Control and Prevention, 2024). The housing varies widely, from modern residences to century-old dwellings, with many families embracing multigenerational living arrangements (The Hopi Tribe, 2022). Community resources remain limited, requiring residents to travel long distances for healthcare and groceries. Economic challenges persist due to the closure of coal mines, significantly reducing job opportunities and increasing financial hardship (The Hopi Tribe, 2022). Approximately 15% of the population lacks health insurance, and access to medical specialists is scarce, contributing to healthcare disparities (Indian Health Service, 2021). Hopi is also at risk of potential loss of language due to lack of resources to teach the new generations. Despite these difficulties, the Hopi people exhibit strong community ties and resilience, traditional agricultural practices through the harvesting of corn and squash, and community-led initiatives (Hopi Cultural Preservation Office, 2009).

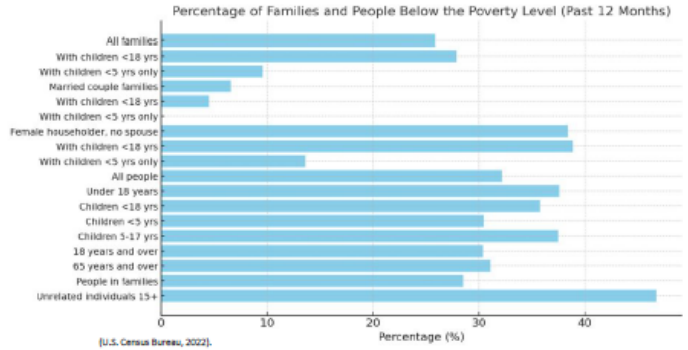
METHODS

The assessment utilized multiple data collection methods, including windshield surveys, two separate site visits to Hopi with engagement from native community members, and research data from Dr. Vicenti. Observations included infrastructure conditions, housing quality, availability of community resources, and economic opportunities. Additional data were gathered from tribal health departments, census reports, and interviews with key stakeholders.

Photo Caption: Housing of community members located on top of the mesas in the Hopi villages

RESULTS

The Hopi community faces significant barriers in healthcare, education, and economic stability. Approximately 23% of residents live below the poverty line, and unemployment remains high at 14.5% (U.S. Census Bureau, 2020). Limited job opportunities and the closure of coal mines have led to economic hardship, with median household incomes dropping from $27,000 in 2010 to $23,500 in 2020 (Arizona Rural Policy Institute, 2019). The community's healthcare infrastructure struggles with accessibility, with only one primary healthcare facility serving over 7,000 residents and requiring patients to travel an average of 90 miles for specialty care (Indian Health Service, 2021). The Hopi reservation is a food island, with 60% of households having limited access to affordable and nutritious food. Moreover, 45% of families rely on food assistance programs (Hopi Tribe Economic Development Corporation, 2022). Grocery stores are scarce, leading to a heavy reliance on low cost ultra processed foods, which directly impact the health of the community. The prevalence of diabetes among Hopi adults is 27%, compared to the national average of 10.5% (Centers for Disease Control and Prevention, 2024). Transportation services exist but remain limited due to lack of organized resources impacting access to essential services. Despite these challenges, the Hopi people maintain a strong cultural identity and exhibit resilience in preserving traditions and community support networks.



CONCLUSIONS AND RECOMMENDATIONS

Addressing the challenges that the Hopi people face will take a multifaceted approach. Expanding healthcare services, increasing educational opportunities, and improving infrastructure are key steps toward a more sustainable future for the Hopi community. Economic development efforts should focus on diversifying job opportunities beyond what was previously coal mining, to exploring tourism, renewable energy, and local small business initiatives. Improved access to healthcare can be achieved through telemedicine services, mobile clinics, and increasing the number of healthcare professionals in the region, which the AHEC program specifically hopes to improve. Enhancing organized transportation services and internet access would also improve access to healthcare, education, and employment. Additionally, addressing food island state through community-based agriculture programs and expanding grocery options would promote better nutrition and long-term health. Lastly, preserving cultural traditions and language while integrating modern resources will help sustain the community's resilience and well-being. With strategic investments and collaborative efforts, there is potential to work towards this in the future.

References

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The Hopi Tribe. (n.d). *Welcome to the Hopi Tribe*. Retrieved March 1, 2025 https://www.hopi-nsn.gov/

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-Ernestine Nasingoetewa, AZ AHEC
-Daniel Sestiage Jr.,AZ AHEC

Community Assessment Report - Maricopa, AZ

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INTRODUCTION

Maricopa, Arizona, and the neighboring Ak-Chin Native Community face significant challenges related to healthcare access. We as healthcare professionals aim to leverage our positions to enact a community-based intervention to improve health outcomes and work towards regional equitable health.

METHODOLOGY

WINDSHIELD SURVEY

- Windshield survey was conducted to identify key attributes and themes of both communities.
- Observational findings were recorded surrounding three domains: community core, subsystems, and perceptions of community members and CAAHEC scholars.

DATA ANALYSIS

- Visual observations from the windshield survey were combined with research completed via community-based and online government resources
- Documented in community assessment manuscript and poster

HEALTH AND SAFETY

HEALTHCARE ACCESS

- Limited healthcare facilities in rural areas
- Transportation challenges for medical visits
- Need for expanded specialty care and services
- Community efforts to improve accessibility

Left: Pictured is the Ak-Chin Gila River Healthcare Clinic on the reservation. This center serves as the main source of primary healthcare for the Ak-Chin Native community.

Right: Pictured is the Exceptional Community Hospital in central Maricopa, AZ. This is one of several modern medical institutions accessible in the city.

SAFETY PROFILE

- Maricopa ranks in the 74th percentile for safety with a B+ grade overall
- Maricopa and the Ak-Chin Indian Community have their own law enforcement, fire services, and community safety programs

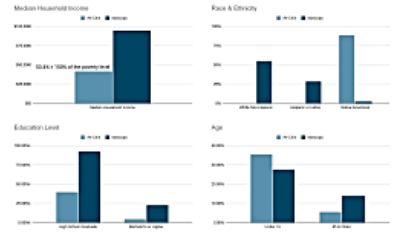
PEOPLE AND CULTURE

HISTORY

- Maricopa
  - Maricopa was originally inhabited by the Akimel O'odham and Maricopa tribes before settlers
  - In the 1800s Maricopa Wells was established as a stop for travelers and stagecoaches but lost its importance by the 1870s
  - In 2003 Maricopa became a city with 1,000 residents
- Ak-Chin
  - Established in 1912
  - Gained federal recognition as a tribe in 1961
  - 1984: gained water rights, expanding agriculture

DEMOGRAPHICS

- Population (2023)
  - Maricopa: 71,022
  - Ak-Chin: 1,070



CULTURE

- Maricopa
  - Fast growing suburb with large corporate presence
  - Some ethnic restaurants and local events
  - Predominantly Christian churches; some LDS & Jewish establishment
- Ak-Chin
  - Deeply connected to its Native heritage
  - Tribal traditions, language and customs, inward focus
  - Ak-Chin Him-Dak Ecomuseum preserves history
  - Agriculture is important to traditional practices

Left: A typical Ak-Chin tribal ceremony documented on display at the Arizona Indian Festival.

Right: The inside of the Ak-Chin Him-Dak Ecomuseum, one of the reservation's homes to traditional art and tributes to soldiers lost at war.

POLITICS

- Maricopa
  - City Council established in 1967
  - 6 council members
- Ak-Chin
  - Government formed in 1961
  - Tribal council contains 5 members

COMMUNITY HEALTH METRICS

- Health issues worsened for community members who have limited access to transportation
- Health data aligns with national trends in Native American populations
  - 14.7% diabetes
  - 41% hypertension

PINAL COUNTY

Above: Insignia of the Pinal County Public Health Department.

INFRASTRUCTURE

FOOD ACCESS

- Maricopa
  - Large corporate presence with many chain restaurants
  - Numerous restaurants and grocery stores for the community
- The Ak-Chin community limited food options
  - Harrah's casino, the Vekol gas station, and the Southern Dunes golf course
  - No markets visualized within the immediate community, no signs of food banks or any local community stores

TRANSPORTATION

- Well maintained bike lanes, sidewalks, and roads
- Efficient public transportation system within Maricopa with:
  - Maricopa Express Transit
  - Bus routes
  - Dial-a-ride
  - Valley Metro
- Limited transportation network on the outskirts of Maricopa and in Ak-Chin
  - Many streets off the main road are either poorly maintained or primitive dirt roads

Above: Community bus stop station that runs through both Maricopa and the Ak-Chin reservation.

ELECTRICAL AND INTERNET

- Electric Providers
  - Ak-Chin - Ak-Chin Energy Services: 12.79 cents kwh, avg. monthly bill $169.92
  - Maricopa - Electrical District No. 3: 14.35 cents kwh, avg. monthly bill $202.24
- Percentage of Households with Internet Access
  - Ak-Chin - 75.1%
  - Maricopa - 97.4%

AIR AND WATER

- Water quality varies based on source and environmental influences for both Maricopa and Ak-Chin communities
- Ak-Chin members may experience water insecurity due to access or distance to nearest water source
- Air quality in mid-January 2025 for PM10 was fair; sensitive groups may experience minor to moderate symptoms from long-term exposure

ECONOMICS AND GROWTH

COMMERCE

- Ak-Chin has experienced vast economic transformation
  - Agriculture is the backbone
    - Ak-Chin Farms has over 15,000 acres
  - Harrah's Ak-Chin Casino
  - Golf course
- Maricopa boasts many chain businesses and luxury services

Above: Harrah's Ak-Chin Casino located on the Eastern border of the Ak-Chin reservation. Established in 1994, it has played a vital role in generating revenue and tourism for the Ak-Chin community.

GROWTH & REVENUE

- The city's population grew 7.1% from July 2023 to July 2024
- The output multiplier for the Ak-Chin community operations is 1.9, meaning that for every 1 million dollars of goods and services produced, an additional $190,000 in economic activity is generated

SUMMARY & CONCLUSIONS

Maricopa, Arizona is susceptible to poor healthcare outcomes due to limited healthcare access, inadequate transportation infrastructure, economic disparities, and significant rural-urban health inequities. The Ak-Chin community faces additional health equity barriers, including a lack of specialized care, difficulties establishing telehealth access, geographical challenges, and food insecurity. The summation of these problems contributes to chronic disease prevalence and burden in both communities. By addressing one of these issues as a team, we aim to take meaningful steps toward rectifying the adversities that people in this community face and improve healthcare outcomes for all.

ACKNOWLEDGEMENTS

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- Maricopa Historical Society Museum and Visitor Center

REFERENCES (SCAN QR CODE)

Identifying Gaps in Rural Healthcare
Payson, Arizona

CERE SCHOLARS
AN ARIZONA AHEC PROGRAM

Center for Excellence in Rural Education (CERE) AHEC Scholars 2024-2026: *Emily Burrows, Sonia Fatahi, Bailey Fowler, Mirna Munoz Garcia, Faith Gonzales, Jesse Higgins, Ryan Karvel, Yva Luc, Ramsey Christopher Martz, Maci Nolbe, Logan Peery, Jenna Pugliese, Gia Quintero, Jennifer Sanchez, Tyler Sedig, Alia Touadjine, Mckayla Vasquez, Emma Walther, Mandi Whittaker, and Lauren Zanotti.* **University Affiliations:** *Arizona State University, Northern Arizona University, and The University of Arizona.* **Faculty Mentor:** *LURA RYDEN, RN/CNO.*

INTRODUCTION & PURPOSE

Payson, a robust and tight-knit rural community in Gila County, faces unique challenges that exemplify the healthcare disparities prevalent in many rural areas across the United States. The purpose of this presentation is to report the results of an inter-professional team-based community needs assessment to identify gaps in healthcare services and explore opportunities to improve health and wellbeing of Payson residents.

The needs of the community of Payson has been illustrated utilizing multiple method modalities. Including a "windshield survey", composed of observational data from multidisciplinary healthcare students, visiting integral components of the community infrastructure such as schools, the local hospital, and community center, and round table discussions which provided vital insights into Payson's demographics, cultural values, physical environment, and available healthcare resources. This ensured that the voice of the community was at the center of the entire project to empower the community and identify pertinent gaps in care.

The findings revealed many strengths within the community such as a strong sense of community and support amongst residents, while also highlighting shortages in specialty healthcare services, such as obstetrics and pediatrics. The need for improved postpartum support and interventions for moms and babies was recurrently made evident, as this community overall faces unique challenges including limited public transportation, economic disparities, and barriers to preventative healthcare access that exacerbate poor maternal and infant health outcomes.

This has informed the development of a service-based project aimed to address the needs outlined in this presentation with the goal to improve the overall health and well-being amongst the communities of Payson, AZ.

METHODS

A mixed-methods approach was used to assess the community of Payson, Arizona. Data collection included a windshield survey conducted in October 2024, where inter-professional teams visited key locations such as clinics, schools, and community hubs to gather observational insights.

Round-table discussions with local leaders, including former Mayor Kenny Evans and healthcare professionals, provided qualitative data on healthcare gaps and community dynamics. Additional information was gathered through online sources, including the Payson General Plan, the U.S. Census Bureau, Data USA, and other local websites, to analyze demographics, environmental conditions, and access to resources. Together, these methods informed a comprehensive community assessment of Payson.

This has informed the development of a service-based project aimed to address the needs outlined in this presentation with the goal to improve the overall health and well-being amongst the communities of Payson, AZ.

PAYSON'S VITAL CONDITIONS FOR HEALTH & WELL-BEING [2]

Belonging - Civic Muscle

Strengths
- Sparklight Fiber ensures access to fast, reliable internet
- MHA Foundation raises money, develops strategic partnerships,and secures grant funding for community projects
- Residents report feeling as though they "know everyone"
- Local newspaper: Payson Roundup *Citation: Town of Payson. (n.d.). Community. Retrieved November 28, 2024 from paysonaz.gov/government*
- *Three local radio stations Citation: Town of Payson. (n.d.). Community. Retrieved November 28, 2024 from paysonaz.gov/government*
- Community Facebook page
- Local businesses reflect local culture

Reliable Transportation

Strengths
- Beeline Bus
- Payson Airport
- Residents report neighbors are happy to offer rides and carpool

Opportunities for Improvement
- Extend public transportation to outlying areas, which have decreased access to vehicles and an increased need for transportation *Citation: United States Department of Agriculture, Economic Research Service. (2024). Food access research atlas. ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas/*
- Build safe pedestrian walkways along all streets
- Reliable transportation to Phoenix

Thriving Natural World

Strengths
- 4 parks
- Rodeo
- 57 scenic trails
- Community Garden
- Avg. temp 72.5 °F
- Camping, Fishing
- Tonto National Forest
- Granite Aquifer Groundwater
- Good average air quality
- Average air temperature 72.5 degrees Fahrenheit *Citation: United States Climate Data. (2024). Climate: Payson, Arizona. Retrieved November 22, 2024 www.usclimatedata.com/climate/payson/arizona/united-states/usaz0159*

Basic Needs for Health + Safety

Strengths
- One critical access hospital w/ 25 beds
- MHA Foundation recruits healthcare workers through CERE-AHEC
- The Christian Clinic offers free and low-cost healthcare

Opportunities for Improvement
- Increase access to healthy, fresh, affordable food in Payson and outlying areas *Citation: United States Department of Agriculture, Economic Research Service. (2024).*
- Increase Healthcare Access
- Increase access to specialized and primary healthcare services
- Provider shortage area
- Improve pedestrian safety and access to care by adding sidewalks to all streets *Citation: Health Resources and Services Administration. (n.d.) Find shortage areas. Retrieved December 3, 2024 from data.hrsa.gov/tools/shortage-area*

Humane Housing

Strengths
- Warming Shelter
- Seasonal overnight shelter
- Newer homes in gated communities
- Historical houses

Opportunities for Improvement
- Homeless population
- Shelter Availability
- Newer homes tend to be in gated communities and historical houses.
- High rent and housing costs relative to median income *Citation: United States Census Bureau. (2022). Payson town, Arizona. data.census.gov/profile/Payson_town,_Arizona?g=1600000US0453700*

Meaningful Work + Health

Strengths
- Many successful, local, small businesses
- Senior Center offers recreation and social activities for retirees
- Volunteer opportunities at schools, hospital, and library
- Hospital and community actively recruits new healthcare providers by offering clinical rotations, residencies, and internships

Opportunities for Improvement
- Recruit and retain professionals to fill vacancies in schools and the hospital
- 50% of population below 200% of Federal Poverty Line *Citation: Arizona Department of Health Services. (2021). Payson primary care area: www.azdhs.gov/documents/prevention/health-systems-development/data-reports-maps/primary-care/gila/23.pdf*

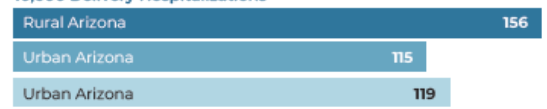
Lifelong Learning

Strengths
- Lifelong Learning Resources:
  - Public library
  - History museum
  - Eastern Arizona College for continued eduation (Payson campus)
  - Aspire Arizona Foundation enables students to earn dual credit and graduate from high school with an associate's degree *Citation: aspirearizona.com*

Opportunities for Improvement
- Schools centrally located in Town of Payson, but cover 525 square miles *Citation: United States Census Bureau. (2023). American Community Survey 5-year estimates. Retrieved from Census Reporter Profile page for PUSD*
- Minimize barriers to attending school, especially for students located in outlying areas (up to 45 miles away from school)

[1] Over **80%** of Maternal Deaths are Preventable

[1] **Severe Maternal Morbidity Rate per 10,000 Delivery Hospitalizations**



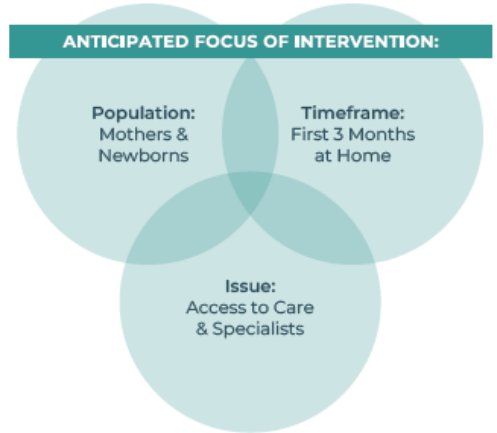
Maternal Mortality per 100,000 live Births in Arizona

FINDINGS

Scholars listened to and engaged with a group of young mothers who delivered babies in Payson. Scholars identified several themes from these conversations:

- Moms and families caring for new babies experienced hardships that are unique to living in a rural area like Payson
- No neonatal specialists
- No home visit within 48 hours of discharge
- Resources given at hospital discharge seemed inaccessible during a crisis
- Information from educational videos watched while in the hospital was not retained after discharge home
- Felt alone and didn't know what to do
- Taking a newborn to Phoenix for specialty care was expensive and time-consuming, and often required finding care for other kids, renting a hotel, minimum 3 hours of driving

ANTICIPATED FOCUS OF INTERVENTION:



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2 Adapted from Seven Vital Conditions for Health and Well-Being [Framework] by Community Commons, n.d. https://www.communitycommons.org/collections/Seven-Vital-Conditions-for-Health-and-Well-Being

A Community Assessment of Winslow Arizona

CPCHP - AHEC Scholars 2024-2026

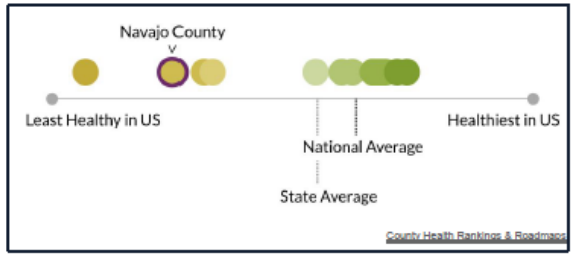
Shannon Aston, Alex Barta, Taylor Black, Jackson Brusseaux, Ramon Bustos, Madison Calabretta, Lindsey Collins, Ryleigh Collins, Evan Gilbert, Victoria Guzman, Andrea Hickman, Da Joo, Anam Khalid, Drew McKearney, Marie Nguyen, Angel Parra, Kim Pierson, Lexi Schwan, Keira Vaughn, Jamie Williams.

COLORADO PLATEAU
CENTER FOR HEALTH PROFESSIONS
AT NORTH COUNTRY HEALTHCARE

INTRODUCTION

Winslow, Arizona, is a historically significant community with a population of just over 9,000. Once a major railroad hub, the city experienced economic decline following the rise of Interstate 40, which diverted traffic from Route 66. Today, Winslow's economy relies on transportation, healthcare, and tourism, with attractions like the *Standin' on the Corner* Park drawing visitors. Despite its strong community identity, Winslow faces significant healthcare challenges. Economic hardship further impacts health outcomes, with 31.6% of residents living in poverty and limited employment opportunities.

NAVAJO CO. HEALTH OUTCOMES



PURPOSE

The purpose of this presentation is to report the results of a team-based field experience aimed at identifying healthcare challenges experienced within the community of Winslow, Arizona.

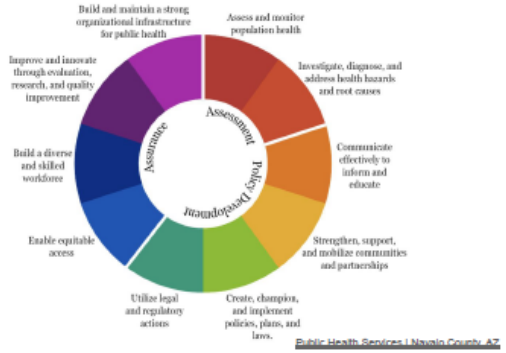
METHOD

Scholars collected data in October 2024 and February 2025 immersions through windshield survey observation, community member presentations, and community member interviews. Population and epidemiological data were gathered through public records via government agency websites.

Windshield Survey Findings

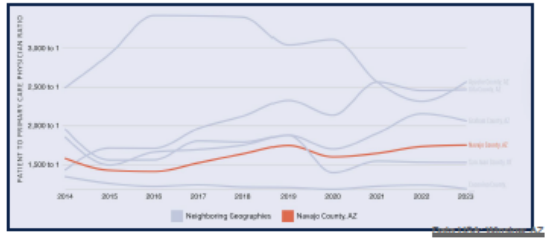
Healthcare Barriers:

1. Access to healthy food
2. Access to primary health services
3. Access to specialty health services
4. Limited transportation options
5. Healthcare and disease stigma
6. Lack of infrastructure



FINDINGS

Healthcare Access Challenges – Many residents must travel to Flagstaff for specialty care due to limited local services.
High Prevalence of Chronic Diseases – Diabetes, obesity, substance abuse, and chronic pain are widespread, worsened by food insecurity and limited healthcare access.
Economic Disparities – About 31.6% of residents live in poverty, with few opportunities for higher-paying jobs.
Lack of Reliable Public Transportation – Limited transit options make it difficult for residents to access healthcare, grocery stores, and employment.
Food Insecurity – Many residents rely on convenience stores rather than grocery stores, limiting access to fresh and nutritious food.
Community Resilience and Strengths – Winslow has a strong sense of community & increasing local engagement



Economic Subsystem	
Employment Rates	Total population: 9,005; Employment rate: 44.6% ± 4.4%
Income Levels	Median household income: $53,114 ± $6,895
Major Industries	Education, Healthcare, & social assistance at 30.8%
Economic Disparities	Citizens without healthcare coverage: 13.8%

SUMMARY & RECOMMENDATIONS

Expand Healthcare Access – Increase primary care, specialty services, support telehealth initiatives, address provider shortages.
Improve Food Security – Strengthen programs like WIC, SNAP, and the farmers market to promote access to nutritious foods.
Enhance Public Transportation – Develop a reliable transportation system to improve access to healthcare, grocery stores, and employment opportunities.
Support Economic Growth – Create job training and workforce development programs to address economic disparities.
Promote Preventative Health Initiatives – Increase community education on nutrition, exercise, and chronic disease management.
Strengthen Community Partnerships – Foster collaboration between healthcare providers, local government, and community organizations to develop sustainable solutions.

CONCLUSION

Winslow's strengths lie in its sense of community, engaged local leadership, and initiatives like the Mother Road Farmers Market that promote food security. However, the city faces significant health disparities. Addressing these disparities requires a comprehensive approach to expanding healthcare services, enhancing public transit, and strengthening local food programs. Sustainable, community-led solutions will be essential in fostering long-term health equity and improving the overall well-being of Winslow residents.

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REFERENCES

THE UNIVERSITY OF ARIZONA
Arizona AHEC
Area Health Education Centers

THE UNIVERSITY OF ARIZONA
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Area Health Education Centers

A COMMUNITY NEEDS ASSESSMENT

BISBEE, ARIZONA

PENNY BURKE ,CHLOË GALLELLO, YARITZA GARCIA, JENNIFER GARNICA, ROCIO GASTELUM, SAM GEIST, MICHAEL JOHNSON, VALERIE LERMA, LAUREN MELCHER, AKWASI MENSAH, HOPE NJUGUNA, Hector Ortiz, Sahara Rahman, Ruthie Ronin, Mark Rothpletz, Joelle Ryan, Delanee Schwartz, Maria Schwindaman, Makenna Thuringer, Lilly Thurlow

INTRODUCTION

The Southern Arizona Area Health Education Center (SAAHEC) was established to understand rural communities in Southern Arizona better. Scholars from Arizona State University, Northern Arizona University, and the University of Arizona have joined the 2026 cohort to study Bisbee, Arizona.

PURPOSE

The primary purpose of this community needs assessment is to understand better the needs of the Bisbee, Arizona, community. This assessment helps us identify various factors that impact the health and wellness of the residents and highlights critical access points that require attention. Our goal is to raise awareness about the needs of this population and share our findings with community stakeholders.

METHODOLOGY

On October 5th and 6th, 2024, our scholars conducted a windshield survey to create this community needs assessment. After completing the survey, the scholars researched online using census data, community experiences, and information from federal and county websites. This research aimed to generate quantitative data to understand Bisbee, Arizona's needs better.

KEY FINDINGS

Economic & Demographic Challenges

- Rising poverty and high living costs are driving young residents away.
- The aging population is dealing with chronic diseases and mental health issues.

Healthcare & Accessibility

- Access to healthcare is limited, compounded by inadequate transportation and grocery options.
- There is a shortage of healthcare workers to meet the community's needs, highlighting the importance of expanding pathways to healthcare careers.

Infrastructure & Environmental Concerns

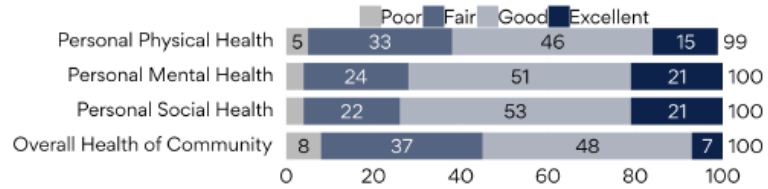
- The area faces environmental risks due to historical mining and frequent power outages.
- While air quality is good, water quality is lower in fluoride, as the EPA monitors.
- Emergency services are reliable, but there is a heavy reliance on personal vehicles for transportation.

Food Security & Education

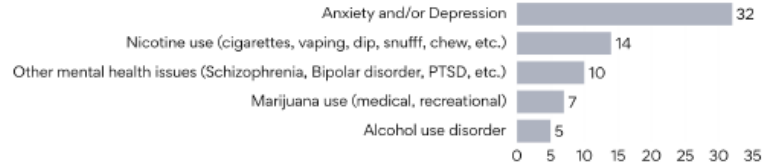
- Residents have limited access to fresh and affordable food, creating a food desert.
- There is a need for increased educational outreach efforts to address these issues.

BISBEE DEMOGRAPHICS

PERCEPTIONS OF PERSONAL & COMMUNITY HEALTH IN BISBEE/DOUGLAS



TOP 5 MENTAL HEALTH CONCERNS REPORTED BY SURVEY RESPONDENTS



BISBEE RACE & ETHNICITY

TECHNOLOGY ACCESS

CONCLUSION

Addressing these challenges, it is essential to improve economic stability, healthcare access, and infrastructure while supporting an aging population and encouraging young residents to stay. Investments in workforce development, transportation, food security, and environmental resilience will be crucial for creating a healthier and more sustainable community.

A Community Assessment of South Yuma County

Aceves, J., Amaya, J., Arellano, S., Barnes, N., Chchiuccariello, B., Freeman, J., Gibson, K., Lerma, F., Metz, B., Morris, C., Munoz, D., Nina, K., Razo, H., Sanchez, A., Sutter, B., Vega, G., Villarreal, J., Walsh, F., Young, S., Zevada, S. WAHEC Faculty Mentor: Alvarez, G.

THE UNIVERSITY OF ARIZONA Arizona AHEC Area Health Education Centers

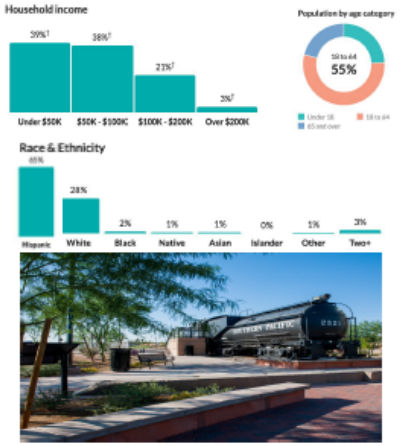
INTRODUCTION

This community needs assessment, conducted by WAHEC scholars, examines the impact of Type 2 Diabetes in Yuma, San Luis, and Somerton, where prevalence exceeds state and national averages. Shaped by history, culture, and socioeconomic factors, the Yuma community faces barriers to care, gaps in health literacy, and environmental challenges that contribute to rising diabetes rates. Beyond its medical toll, diabetes affects workforce productivity, family life, and overall well-being. By identifying community strengths, healthcare gaps, and intervention opportunities, this study aims to inform targeted strategies to improve health outcomes and reduce disparities in Yuma County.

HISTORY, CULTURE, & COMMUNITY

Yuma, San Luis, and Somerton developed as agricultural settlements, with Yuma historically serving as a key Colorado River crossing. Since Spanish exploration in 1540 and the arrival of the Southern Pacific Railroad in 1870, the region has grown into a hub for commerce, agriculture, and cross-border trade

DEMOGRAPHICS



METHODS

This assessment utilized a mixed-methods approach, incorporating primary data collection and secondary research to evaluate community needs.

Primary data was collected through WAHEC-organized immersions, including windshield surveys and direct observation in Somerton and San Luis via vehicular and on-foot assessments. Key areas of interest included the US/Mexico border and Regional Center for Border Health San Luis Medical Mall, with engagement from local residents and businesses.

Secondary research included peer-reviewed articles from government databases and reputable journals, along with census data for demographic and health insights.

TRANSPORTATION & INFRASTRUCTURE

85.2% of community members rely on personal vehicles, while **14.8% lack access**, with disparities among young adults, low-income, and Hispanic residents.

Public Transit:

- YCAT operates fixed-route, vanpool, and Dial-A-Ride (DAR) services.
- YCAT OnCall provides door-to-door paratransit for seniors (60+) and individuals with disabilities.

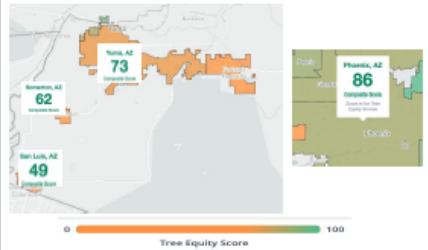
Pedestrian & ADA Compliance:

- 26 miles of sidewalks are needed for full pedestrian access.
- Only 26% of intersections and 28% of driveways meet ADA standards, restricting mobility.

PHYSICAL ENVIRONMENT

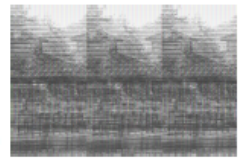
Yuma, Somerton, and San Luis are rural desert communities, characterized by a mix of farmland and arid landscapes. The region experiences temperature extremes, ranging from lows of 43°F in winter to highs over 108°F in summer, with limited natural shade and prolonged heat exposure.

The **Tree Equity Score**, by American Forests, measures tree cover distribution. Lower scores indicate less shade, higher temperatures, and greater health risks for vulnerable communities.



PARKS & RECREATION

- **50+ parks** serve Yuma, San Luis, and Somerton, but **65% of residents live over three miles away from any parks.**
- Key parks offer sports fields, aquatic centers, and community programs, but distance and transportation remain barriers in certain communities.



GOVERNMENT/ECONOMY:

- **Employment:** Yuma's largest employers are agricultural companies and the military, with agribusiness contributing $3.4B annually and MCAS Yuma and Yuma Proving Ground generating over $1.7B in economic impact.
- **Unemployment:** 11.9% (Dec 2024)—highest in Arizona, well above the state average of 3.8%
- **Household income:** $57,300, 28% below the national average.
- **Poverty & Assistance:** 16.5% live below the poverty line, with 20.2% relying on SNAP benefits.
- **Government & Development:** Yuma's strategic location near California and Mexico supports cross-border trade, manufacturing, and logistics.

HEALTH STATUS

Chronic Disease & Obesity

- **Obesity:** Affects ~**40% of adults**, leading to increased risks for **diabetes and heart disease**.
- **Diabetes:** Mortality rate (**30.4 per 100,000**) exceeds state (**24.3**) and national (**21.3**) averages, and disproportionately affecting **Hispanic and Native American** populations.

Healthcare Access & Shortages

- **Medically Underserved:** Entire county designated as an **MUA**, with a **2,293:1 patient-to-physician ratio** (state avg. **1,294:1**).
- **Medical Centers:**
  - **Somerton:** 3 centers within **0.2 miles**.
  - **Yuma:** 13 centers within **3 miles**.
  - **San Luis:** 8 centers within **0.5 miles**.

Mental Health & Barriers

- **Provider Shortage: 2,293:1 (state avg. 1524:1)**
- **Patient-to-mental health provider ratio 1294:1** (state avg. **590:1**)
- **High Mental Health Burden: 1 in 5 adults** reports poor mental health; **rising substance use disorders** remain untreated.
- **Health Disparities: 23.2% face food insecurity**; extreme heat limits outdoor activity, worsening chronic disease risks.

NUTRITION

Food insecurity remains an issue in the county:

- **23.2%** of residents report **limited access to food** due to financial restrictions or geographic location.
- **65%** of residents live **three or more miles from a grocery store**.
- **44,684** residents in Yuma County are enrolled in the **Supplemental Nutrition Assistance Program** to meet their nutritional needs (as of 2022 data). This is a drastic increase compared to 2020's enrollment of 37,000.

HEALTH LITERACY/EDUCATION

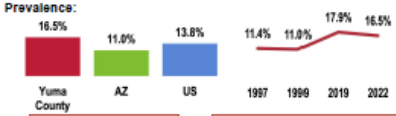
In Yuma County, **76.6% of residents are high school graduates**; in San Luis, 55% of residents are high school graduates, and in Somerton, 65.2% of residents are high school graduates.

Yuma County contains a number of educational institutions: fifty elementary and middle schools, five public high schools, one private high school, and six private K-12 schools. Overall, **the public high schools report an 82% graduation rate**. This is above the state average, which is 77%. Additionally, Yuma has a community college, Arizona Western College, with satellite campuses for the 3 major universities in Arizona: NAU, ASU, and UArizona. Arizona Western has a 12% graduation rate for the Associate's degree pathway. Although there is local access to a college campus, only **16.7% of residents have a Bachelor's degree** or higher.

Education is essential to comprehending health care information. Lower graduation rates correlate to a lower health literacy level. Without a completed high school education, patients may have a hard time understanding what is discussed at healthcare visits.

DIABETES MELLITUS TYPE 2

Prevalence:



Another 9.6% of adults have been diagnosed with "pre-diabetes" or "borderline" diabetes.

Note that among adults who have not been diagnosed with diabetes, 40.8% report having had their blood sugar level tested within the past three years.

Key Contributing Factors

- **Limited Healthcare Access:** A 2,293:1 patient-to-physician ratio restricts screenings and diabetes management.
- **Financial Barriers:** High insulin and medication costs limit treatment affordability.
- **Food Deserts & Poor Diet:** Limited access to healthy, affordable food increases reliance on processed, high-calorie diets.
- **Physical Inactivity:** Extreme heat, limited parks (65% live over 3 miles away), and poor pedestrian infrastructure reduce exercise opportunities.
- **Mental Health & Stress:** High rates of anxiety and depression worsen diabetes management, compounded by limited psychiatric care.
- **Disparities:** Hispanic (13.4%) and diverse racial groups (32.7%) face higher diabetes prevalence; 17.2% of Hispanic residents are uninsured.

SUMMARY

Yuma County benefits from a robust healthcare network working to improve healthcare accessibility through outreach and preventive initiatives. Economically, the county generates $3.4 billion annually, largely from agriculture, supplying 90% of the nation's winter leafy greens. A strong sense of community supports public health efforts, with cultural and educational programs promoting disease prevention.

Despite these strengths, key opportunities exist to enhance healthcare accessibility. Expanding telehealth services would reduce long travel times for care while increased funding for preventive health programs, particularly in diabetes management, maternal care, and mental health, would address pressing community needs. Transportation improvements, including expanded public transit, could bridge access gaps for underserved populations. Lastly, collaborations with schools, businesses, and community organizations would strengthen health education and improve access to nutritious food, aligning with the Yuma 2030 Comprehensive Plan's vision for a healthier, more sustainable future.

CONCLUSION

Healthcare disparities, limited provider availability, and gaps in health literacy remain significant challenges throughout Yuma County. Economic instability, the high prevalence of Type 2 diabetes, and restricted access to affordable nutritious food contribute to poor health outcomes. These issues require targeted interventions to expand healthcare access and strengthen community resources.

Through the support of government funding, educational initiatives, and programs like WAHEC, efforts can be made to bridge these gaps. By enhancing healthcare services, promoting preventive care, and fostering community partnerships, Yuma, Somerton and San Luis can move toward a healthier and more equitable future.

ACKNOWLEDGEMENTS

We extend our gratitude to Ms. Amanda Aguirre, Augustin Morales, MD , Gustavo Daniel Alvarez, the Regional Center for Border Health Team, and WAHEC

REFERENCES

The Gift of Life: Post-mortem Tissue Donation Inequities Facing Rural Populations

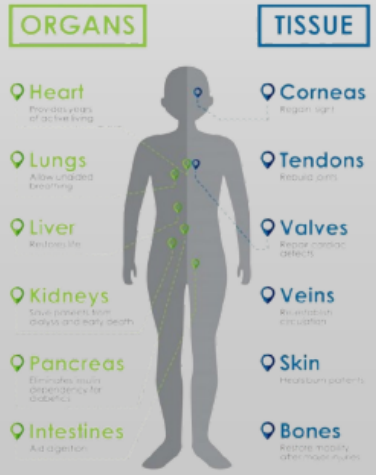
Kevin J. Ball, Kyle Avery, Andrew W. Atkinson, Joseph Solomon
The University of Arizona College of Medicine - Phoenix

Purpose

To explore challenges rural community partners face in post-mortem tissue donation, stemming from the insufficient prioritization of logistical factors when negotiating contracts with tissue banks and organ procurement organizations.

Organ vs. Tissue Donation

Unlike organ donation, which takes place in operating rooms shortly after a donor's death, tissue donation can happen in various settings and allows for a longer recovery period due to refrigeration and preservation methods. This extended window typically ranges from 16 to 24 hours after the donor's time of death. However, rural communities encounter substantial challenges that limit their ability to participate in tissue donation programs.



Framework of Tissue Donation

Tissue donation is a vital process that occurs post-mortem in hospitals, medical examiners' offices, and even funeral homes. Each year, thousands of life-saving and life-enhancing tissue grafts are made possible through donation, yet rural populations experience reduced donation rates due to logistical barriers.

The tissue donation process operates on a contractual basis, where tissue banks (typically Organ Procurement Organizations - OPOs) develop exclusive partnerships with hospitals, counties, and funeral homes. Many tissue banks are headquartered in urban centers due to infrastructure, access to medical facilities, and staffing considerations, creating logistical challenges that must be overcome when donation opportunities arise in rural communities. Before a tissue recovery team can be dispatched, several steps must be completed:

- Authorization from medical examiners and donor families
- Collection of social and medical histories through interviewing legal next of kin
- Medical record reviews and screenings
- Determining the location and transportation logistics of the donor/recovery team to appropriate recovery sites

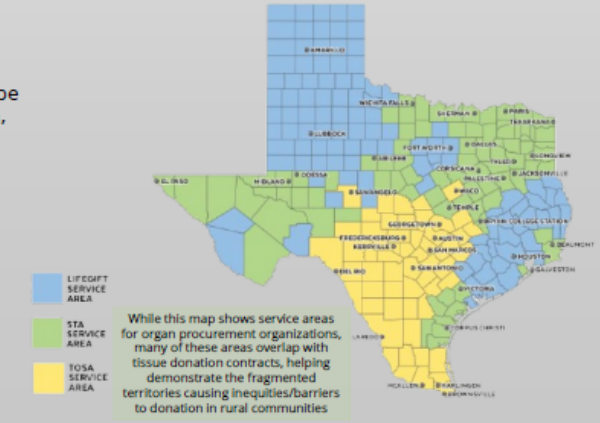
Due to biological constraints, these steps must be completed within 24 hours of the donor's death, and this timeframe can be shorter for tissues that degrade more rapidly, such as corneas and hearts.

Challenges Facing Rural Communities

Rural populations face significant barriers to tissue donation due to logistical challenges, including:

- Longer drive times leading to expiration of viable tissues before recovery teams arrive
- Limited transportation resources, making it difficult to transfer the deceased to an appropriate recovery site in time
- Staffing shortages in rural hospitals, medical examiners' offices, and funeral homes, leading to delays in processing necessary paperwork, transporting of decedents, and access to suitable recovery facilities
- Inclement weather, which can delay or prevent donor and recovery team transportation
- One study has shown that rural populations have a lower rate of wait-listing for, and transplant of, solid organs

Many community partners sign contracts with tissue banks where focus is placed on financial rather than logistical considerations. As a result, they unknowingly become partners with tissue banks that are unable to provide tissue recovery services within appropriate time constraints, thereby reducing community donation rates.



While this map shows service areas for organ procurement organizations, many of these areas overlap with tissue donation contracts, helping demonstrate the fragmented territories causing inequities/barriers to donation in rural communities

Proposed Best Practices

To create a more ethical and equitable tissue donation system, contracts should be assigned based on geography and resource availability rather than administrative convenience and revenue. Key recommendations include:

- Prioritizing contracts with recovery teams based closest to rural partners to minimize transport delays
- Establishing regional partnerships with smaller hospitals or funeral homes to serve as decentralized recovery sites
- Accounting for seasonal road closures and weather-related delays in contract considerations
- For rural areas which straddle state lines, ensuring recovery agencies have in-state teams as potential donors cannot typically be transported interstate due to legal barriers
- Creating funding or policy initiatives to incentivize tissue banks to expand their reach into rural communities

By addressing these inequities, we can improve rural tissue donation rates and honor the generosity of donors and their families.

References

- American Association of Tissue Banks (AATB). (January 2025). Guidance Documents
- Muco E, Yarrarapu SNS, Douedi H, et al. Tissue and Organ Donation. [Updated 2023 Jul 24]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK557431/
- Axelrod, D. A., et al. (2008). Rates of solid-organ wait-listing, transplantation, and survival among residents of rural and urban areas. *JAMA*, 299(2), 202–207. https://doi.org/10.1001/jama.2007.50

Register to be an organ and tissue donor:

DONATE LIFE Arizona

DONE VIDA Arizona

Acknowledgements

NAU NORTHERN ARIZONA UNIVERSITY
College of Nursing

Typhoid

Chelsea Brumbaugh
College of Nursing, Northern Arizona University, Flagstaff, Az

Purpose

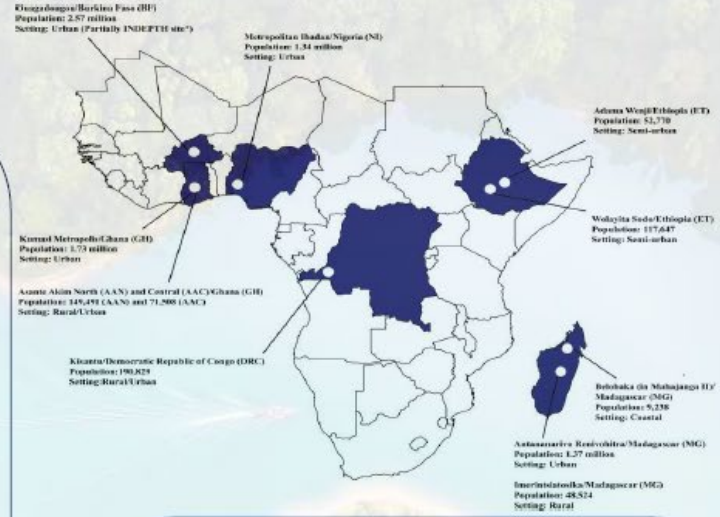
Provide recommendations on prevention and treatment for Typhoid fever.

Background

- Typhoid is a life-threatening systemic infection that is transmitted through ingesting contaminated food or water
- Caused by bacterium Salmonella Typhi
- Common symptoms: Headache, fever, abdominal pain, fatigue, nausea/vomiting, diarrhea or constipation, rose colored rash on chest or abdomen, muscle aches, weakness, sore throat, and cough
- As of 2019, 9 million people get infected with typhoid and 110,000 deaths occur worldwide 3
- Highest incidence is in South-East Asia, Eastern Mediterranean, and African regions
- CDC estimates 5,700 cases in the United States each year 3
- Prophylactic vaccination is available but prevalence of vaccination falls below in developing countries due to lack of access

Methods

- Investigate the burden and severity of typhoid infections with increased surveillance programs
- Education and community engagement on knowledge of the infectious disease
- Increase healthcare accessibility including vaccines, testing, and treatment



Recommended Treatment

- Prevention with education is crucial, especially where there is a lack of healthcare in rural areas
- Supportive measures for fevers and symptom management
- Antibiotics when warranted: Fluoroquinolones (ciprofloxacin or ofloxacin) 1
- Azithromycin if reduced susceptibility to fluroquinolones 1
- Adults Cipro 500mg BID x 7-10 days
  - Resistance then Azithromycin 1g daily for 5-7 days 1
- Children: Cipro 30mg/kg po BID x 7-10 days (Max 1000mg/day) 1
  - Resistance then Azithromycin 10-20 mg/kg/d for 10 days((Max 1000mg/day) 1

Summary and Recommendations

- Access to safe water (boiling water) and adequate sanitation, health education, and typhoid vaccination are all effective strategies for prevention
- Access to diagnosis for proper treatment
- Increasing antibiotic resistance is increasing and therefore providers need to be aware of local resistance patterns and prescribe accordingly
- The Strategic Advisory Group of Experts on Immunizations (SAGE) recommend the typhoid conjugate vaccine be added to routine childhood immunization programs in typhoid endemic countries 2

References

Goiters in Nigeria, Africa

Ciara Brumbaugh

College of Nursing, Northern Arizona University, Flagstaff, Az 86001

Iodine

Purpose

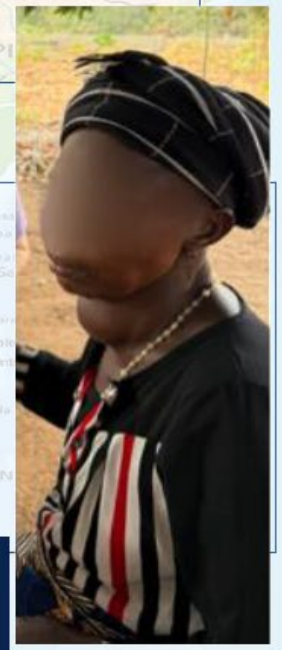
- To provide education for patients and providers in Nigeria, Africa on goiters.
- To educate patients and providers on common symptoms with goiters verses hypo/hyperthyroidism.
- January 2025, 8 providers went to Nigeria Africa to serve 8 villages.

Methods

- Increase education on iodine containing foods
- Educate patients on how to do self exams
- Educate healthcare providers proper exam

Recommendations

- Increase iodine intake in diet such as beans, fruit and fish
- Provide education on self examination and when to seek medical attention



Background

- In Africa, most patients present with a large goiter that is soft to touch, no nodules noted and typically asymptotic.
- The average meal for a person living in African includes vegetables, chicken and rice. Dairy products are limited and fish is very expensive and typically unusual.

Findings

- During our 8 clinic days, we had the privilege of serving 1,355 patients, of these patients approximately 320 patient's have goiters.
- Iodine deficiency disorders affect over 150 million people world wide.
- Goiters are about 4.7 % in USA where as Africa is about 28.3%

References

Acknowledgments

NAU NORTHERN ARIZONA UNIVERSITY

College of Nursing

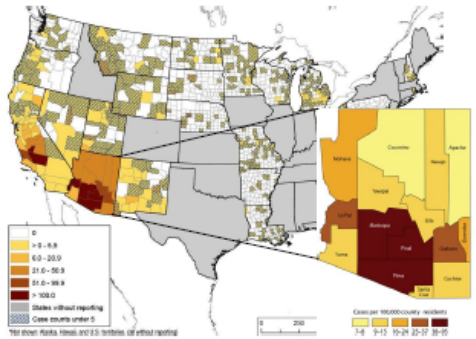
THE UNIVERSITY OF ARIZONA College of Nursing

Addressing the Valley Fever Knowledge Gap in Rural Arizona Primary Care

Rebecca R. Foley, DNP, FNP-BC, MPH; Dr. Lori Martin-Plank, PhD, BSN; Dr. Patricia Daly, PhD, FNP-BC; Dr. John Galgiani, MD

Background

- Coccidioidomycosis (Valley Fever) is a **fungal infection contracted by inhaling spores** found in dust of endemic regions[3]
- Southern Arizona has **highest incidence in the nation**[1, 3]
- Valley Fever (VF) **responsible for 1/3 of all pneumonia** in Southern Arizona[6]
- **However, only 2-13% of Arizona providers test** for VF[8, 13]
  - 80% providers never received prior VF training
- **Average 1-month diagnosis delay**, 80% are misdiagnosed[4,13]
- **Rural Arizona communities experience unique risks:**
  - High-risk occupations: agriculture, construction[9, 11]
  - Poor VF specialist access (all in urban areas)
  - Native Americans have 4-fold higher risk[10, 15]



Coccidioidomycosis Cases in the United States, 2017[1, 12]

Methods

- Partnership with **a rural community health organization** in Marana, Arizona with 14 clinics serving 60,000 patients
- Synchronous, **30-minute virtual educational training**
  - Content developed from IDSA clinical practice guidelines, VFCE PCP manual, CDC guidelines[2, 5, 14]
- **Virtual introduction to VF expert from Valley Fever Center for Excellence (VFCE)** during presentation
- Pocket-sized PCP manual and printed clinician VF decision-making flowchart provided
- Qualtrics post-pre survey link given to participants
  - Descriptive and inferential statistics used in analysis

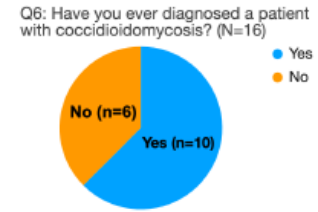
Participant Characteristics

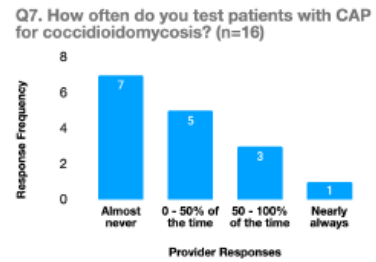
- 51 primary care providers invited to attend
- 31 attended, **19 surveys submitted (4 partial completions)**
- 11 NPs, 3 DOs, 5 unspecified
- Mean years lived in Arizona 21.4 (SD 3.4)
- Majority (67%) had less than 5 years experience practicing as a provider in Arizona
- Only 20% of Arizona trained providers reported receiving prior education on VF

Results: Provider Practice

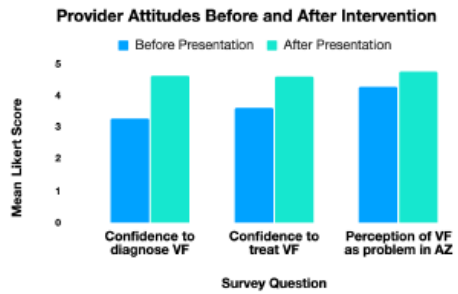
Current provider practice for VF:

- **Nearly 40% had never diagnosed a patient with Valley Fever**
- **Only 6% appropriately test for VF per guidelines**
- **44% report "almost never" testing for VF**





Results: Provider Attitudes & Beliefs



After Educational Training:

- **Statistically significant improvement (p = 0.001)** in provider confidence in **ability to diagnosis VF**
- **Statistically significant improvement (p = 0.011)** in provider confidence in **ability to treat VF**
- **Statistically significant improvement (p= 0.024)** in provider perception of **VF as a problem in Arizona**

Results: Provider Knowledge

After Educational Training:

- **Statistically significant improvement in provider knowledge of lab testing for VF**
- Improvement in knowledge of health department surveillance of VF
- Mixed results on whether improvement in knowledge of vaccine for VF

Provider Knowledge Before and After Training

	Pre-Intervention (n, %)	Post-Intervention (n, %)	p-value
Knowledge of VF lab testing	8 (50%)	16 (100%)	**.030**
Knowledge of AZ Health Dept Reporting	5 (31%)	15 (93%)	.091
Knowledge of VF vaccine availability	7 (41%)	11 (65%)	.289

Discussion

- Results of current provider practice correlated with prior studies, demonstrating significant knowledge gap VF management in Arizona providers[4, 8, 13]
- **Primary care provider in-service training may be an effective method for improving provider confidence to diagnose, manage, and treat VF**
- Statistically significant improvements in rural provider VF knowledge and confidence were demonstrated
- **Connecting rural providers with urban experts such as the VFCE could improve outcomes**
- Further support is needed to include VF training in curricula of Arizona academic health professions programs
- Development of free provider CEs on VF management may be helpful to further VF awareness

Future Research

- Continued research linking rural health professionals to urban specialty resources is needed
- Further research on Valley Fever in rural settings is indicated to mitigate risks, further examine rural risk factors, and plan interventions

Acknowledgements:

THE UNIVERSITY OF ARIZONA COLLEGE OF MEDICINE TUCSON
Valley Fever Center for Excellence

References

Satisfaction and Usefulness of Women's Health Telemedicine Video Visits Consults

Sodhi N[1], Yee C[3], Quillen J[3], Sobel T[2], Vegunta S[2], David PS[2]
[1]Univerisity of Arizona College of Medicine, Tucson, AZ [2]
Division of Women's Health Internal Medicine, Mayo Clinic, Scottsdale, AZ [3]
Division of Biomedical Statistics and Informatics, Department of Health Sciences Research, Mayo Clinic, Scottsdale, AZ

Objective

In the post-COVID era, telemedicine video visits has become common practice and is beneficial for both patients and providers. This is especially helpful for patients with limited mobility, and improves access for patients living in remote areas, saving them time and money.[1,2] In our women's health clinical practice, we hypothesized that women who are younger, employed, and live farther from clinic location, will be more satisfied with telemedicine video visits.

Design

- Mayo Clinic Survey Research Center developed a brief REDCap online survey to administer to patients who had attended a women's health consult via a telemedicine video visit across all three sites (AZ, MN, FL). IRB approval was obtained, and survey was directly sent to the patient's preferred email.
- Initial data was collected between October 2023 and June 2024.
- We collected patient characteristics, visit type, and satisfaction to be descriptively summarized by our biostatistical staff.
- The primary endpoints included four aspects of patient satisfaction with the telemedicine video visits experience:
  - → **Usefulness**: Assessed with a set of three items (e.g., "telemedicine video visits improves my access to healthcare services").
  - → **Satisfaction**: Measured using four items (e.g., "I would use telehealth services again").
  - → **Trust in Provider**: Measured with a single item ("I trust my doctor with sensitive information").
  - → **Technical difficulties**: Assessed by asking patients
    - to what extent they experienced technical difficulties
    - how frustrating were technical difficulties
      - Higher numbers reflect more technical difficulties and more frustration
- All primary endpoints were rated on a 1 (Strongly Disagree) to 7 (Strongly Agree) scale. All three items were averaged together to create a single composite according to published scoring instructions.[3]
- The primary analysis examined relationships between patient characteristics (age, employment, and distance from clinic) and a series of satisfaction outcomes (e.g., usefulness, satisfaction, trust in provider, and technical difficulties) using a set of independent samples t-tests.
- P-values < 0.05 were considered statistically significant.

Telemedicine video visits Survey Outcomes by Patient Employment Status, Age, and Distance

	Employed Full-time Average M (sd)	Not Employed Full-time Average M (sd)	Δ	95% CI	p
Usefulness	6.4 (0.9)	6.2 (0.9)	-0.2	(-0.5, 0.1)	0.2423
Satisfaction	6.3 (1.1)	6.3 (1)	0	(-0.3, 0.4)	0.8833
Trust in provider	4.8 (0.6)	4.7 (0.8)	-0.1	(-0.4, 0.2)	0.5108
Technical difficulties	1.6(1.6)	1.9 (1.7)	0.1	(-0.5, 0.7)	0.6823
	54 Years of Age or Younger Average M (sd)	**Older than 54 Years of AgeAverage M (sd)**	**Δ**	**95% CI**	**p**
Usefulness	6.5 (0.7)	6.2 (1.1)	-0.3	(-0.5, 0.1)	0.2423
Satisfaction	6.5 (0.8)	6.2 (1.2)	-0.3	(-0.3, 0.4)	0.8833
Trust in provider	4.8 (0.6)	4.7 (0.9)	-0.1	(-0.4, 0.2)	0.5108
Technical difficulties	1.5 (1.4)	1.7 (1.5)	0.2	(-0.4, 0.8)	0.4972
	<51 Miles Away Average M (sd)	**Not Employed Full-time Average M (sd)**	**Δ**	**95% CI**	**p**
Usefulness	6.3 (1)	6.4 (0.9)	0.1	(-0.2, 0.5)	0.3486
Satisfaction	6.3 (1)	6.3 (1.1)	0	(-0.3, 0.4)	0.8984
Trust in provider	4.7 (0.7)	4.8 (0.6)	0.1	(-0.2, 0.3)	0.5209
Technical difficulties	1.9(1.6)	1.9 (1.7)	0	(-0.5, 0.6)	0.8942

**Scale 1 (strongly disagree) to 7 (strongly agree) M = mean, sd = standard deviation

This poster presentation was previously presented at the National Menopause Conference in September 2024

Financial support for this poster presentation provided by the Arizona Telemedicine Program https://telemedicine.arizona.edu

Results

- Of the 696 surveys sent, 156 patients completed the questionnaire →19.5% response rate
- The average age was 54.3 years (SD=9.8)
- Primarily Caucasian (77.9%), employed full time (57%), living 50 miles or less than the clinic (54.8%), and in a suburban setting (68.7%)
- Results showed that overall, participants did not experience significant technical difficulties and there was no difference based on age, employment, or distance from clinic
- A majority of participants found telehealth useful and were satisfied with it, without differences based on age, employment, or distance from clinic
- Patients reported mostly neutral scores for trust in providers

Conclusions

In this study, most women found telehealth to be highly satisfying, useful, and had little to no difficulties with technology regardless of age, employment, or distance from clinic.

Patients reported mostly neutral scores surrounding trust in providers. This can be improved by providing reassurance and patient education regarding information security on telemedicine video visits portals.

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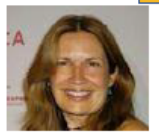
Significance of Routine Lung Cancer Screening

Ryan Ahmadi

College of Nursing, Northern Arizona University, Flagstaff

Introduction

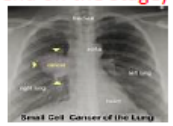


- Do you know this lady? (10 Secs)
- 44 Y/O female, died of Non-Small Cell Lung Cancer.
- Never Smoked Cigarettes.
- Could she have been saved? Yes

- Purpose: PCPs to Prevent & Detect Lung Cancer Early & Prevent Lung Cancer Deaths
- Early Prevention Method: Chest x-ray, LDCT
- Lung Diseases in Antiquity: Egyptians, Chinese, Greeks (Hippocrates, 2400 yrs ago), and Romans (Galen, 1900 yrs ago)
- Described: Imbalances of the Body & Mind Under Environmental Influences!
- Most Common Diseases: #1 CVD; #2 Cancers (including Lung cancer); #3 Resp. Diseases)
- New Cases: +250K/ yr (2023)
- Deaths: +130K/ yr
- Rate: ¼ Total Cancer Deaths (Preventable)
- 5-Year Relative Survival Rate: 23% (all stages combined)
- Lung Cancer: Very Low Survival Rate Compared to Other Cancers (Late Diagnosis)

Body

- Lung Cancer Causes:
  - ➢Smoking, Asbestos, Radon, Air Pollution, Genetics
  - ➢At Risk Population: Smokers, Former Smokers, Second-Hand Smoke Exposure, Occupational & Environmental Toxins Exposures, Old Age???
  - ➢Symptoms: SOB, Wheezing, Bloody Sputum, Chest Pain with deep breathing, Fatigue, Recurring Resp. Infections, Weight Loss
- Lung Cancer 2 Main Types:
  - ➢ 1) Small Cell Lung Cancer (SCLC)
    10-15%
    Most Aggressive
  - ➢2) Non-Small Cell Lung Cancer (NSCLC)
    85-90%
    Stages: I-IV (Early Stages, Better Outcomes)
- $$$: $60K-$200K or Higher/ Pt (Depend on the Stage)
- $$$: Chest X-Ray ($20- $100)



Discussion

➢Not Famous People:

- 1) 67 Y/O Male, Retired Decorated Navy Officer/ Smoked Cuban Cigars/ Covid/ Died 2 months after Dx
- 2) 64 Y/O Female Nurse/ Died 4 months after Dx

➢ Both Asked for Chest X-rays, PCP Refused.
➢ 1) Chest X-Ray Cost: $ 0.00 at the VA Clinic
➢ 2) Chest X-Ray Cost: $ 20.00 (Co-pay)
➢ Both went on Hospice
➢ Superman: "The Quest for Peace"

➢ 1) USPSTF Screening Recom.: Adults 50-80, 20 pack/ yr, Former smokers who quit within the past 15 yrs
➢ 2) ACS Screening Recom.: Adults 55-74, 30 pack/ yr, Former smokers who quit within the past 15 yrs
➢ 3) My Cardiology Preceptor Recom.: Anyone who smoked 15 cigarettes in a lifetime and explains his justification to the insurance company (Ex: LDCT will cost you less than treatment)

Treatment/ Solution: 1) Prevention (no control), 2)Detection (easiest), 3)Treatment (most difficult & costly)

Conclusion

Options: Prevention and Early detection of all or most Cancers are possible by an initial investment in public health. There will always be claims and counterclaims for limited resources to defeat diseases, but smart investments will undoubtedly save more lives and resources.

State of Florida: In February of 2025, the State allocated $ 200 KK for prevention, detection, and treatment of "Rare Diseases" including Lung cancers, and awarded its first $2KK to find new approaches to fight cancers.

Federal Mandates: Since we know that Non-smokers can get Lung cancer, we need to screen at a younger age and more often.

Lung Cancer Treatments: Not good enough.

Solution: Lung Cancer Prevention & Early Detection

Acknowledgements:
All my professors who allowed me to present my E-Poster, instead of traveling to Phoenix.

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Efficacy of Ozempic on HbA1c reduction in diabetic populations

College of Health & Human Services
School of Nursing
Paul Badger
Faculty Sponsor: *Shelley Vaughn, DNP*

Purpose of the Project

Ozempic has become a popular medication for patients with type 2 diabetes mellitus. It has many benefits including: HbA1c reduction, low risk of hypoglycemia, weight loss, and cardiovascular benefits (Clements et al., 2021)

The purpose of this project is to evaluate the efficacy of Ozempic on the reduction of HbA1c, and compare rural clinic data to national data.

Problem

Diabetes affects approximately 38 million people in the United States alone. Many health concerns in this population result from poorly controlled blood glucose, and cardiovascular related diseases are the leading cause of death and health complications for these patients. A one percent decrease in HbA1c can yield a 15-17% decrease in cardiovascular risk (An et al., 2020; Kelsey et., 2022).

Setting

Rural primary care clinic, Safford, Graham County, AZ.

Patient Population

Inclusion criteria: Adults with a diagnosis of type 2 diabetes who were prescribed Ozempic as part of their treatment regimen along with other diabetic medications.

Exclusion criteria: Fewer than 2 data points (HbA1c), Documented limited access to medication (pharmacy or insurance issues), and documented poor compliance with medication

Clinical Question

In diabetic patients, how does the use of Ozempic affect their HbA1c over a six to nine month period, when compared to prior treatment?

Review of the Literature

In a consensus report the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) established recommendations for diabetic management including the use GLP-1 medications in several scenarios with semaglutide as the preferred GLP-1 in most cases (Buse et al., 2019; El Sayed et al., 2022).

Systematic review and meta analysis of GLP-1 medications showed injectable semaglutide (Ozempic) to have a greater impact on HbA1c reduction than other medications in the same class with a mean reduction of 1.76% (Chun & Butts, 2020; Clements et al., 2021; Zaazouee et al., 2022)

Clinic Results

Clinic data showed a mean HbA1c reduction of 1.67%
Mean HbA1c prior to Ozempic - 8.98%
Mean HbA1c following Ozempic – 7.31%
50% of patients included in the sample had an HbA1c of 7% or less after 6-9 months on Ozempic.

Proposed Best Practice

Metformin remains the preferred initial treatment for patients with type 2 diabetes due to the high safety profile, efficacy, and cost (El Sayed et al., 2022).

For patients with persistent hyperglycemia despite metformin use a second medication can be added taking into account efficacy, risks for hypoglycemia, comorbid conditions, impact on weight, side effects and cost (El Sayed et al., 2022).

With that criteria in mind the a GLP1 such as Ozempic may be included as second agent. Current ADA recommendations prefer a trial of a GLP1 before basal insulin (El Sayed et al., 2022).

Conclusion

National data suggests that including Ozempic can reduce HbA1c by 1.76%.
Clinic data showed a mean HbA1c reduction of 1.67% with 50% of the sample population maintaining an HbA1c of 7% or less.

Ozempic is an effective treatment option for reduction of elevated HbA1c in Type 2 Diabetes.

References

Colorectal Cancer:

The Role of Primary Care in Prevention, Screening, and Latest Treatments

Overview of Colorectal Cancer

- The growth of cells in the colon and rectum, which often begins as a polyp [1]
- The second leading cause of cancer-related deaths in the United States [17]
- 153,000 new cases were diagnosed in 2023 [15]
- Costs over $24 billion dollars annually in the United States [5]

Primary Care Providers Role

- Educate patients on risk factors, modifiable behaviors, and the importance of screenings.
- Recommend, schedule, and interpret screening results

Modifiable/Non-Modifiable Risk Factors

- Diet (high-fat, low fiber), Obesity, Lack of physical activity
- Smoking, Excessive alcohol use
- Controlling inflammatory bowel disease such as Crohn's disease or ulcerative colitis [15, 18]
- Age (median age 65), Family history of cancer or polyps
- Genetic predispositions such as Lynch Syndrome or familial adenomatous polyposis

Figure 1: Image of the colon and rectum. [4]

Screening Guidelines

- Routine screening for ages 45-75 [6]
- Persons 76-85 may be screened based on risk factors.
- Screening may begin earlier than 45 dependent on risk factors

Screening Methods

- **Non-Invasive**
- Done every 1-3 years: Fecal Occult Blood test (FOBT), Fecal Immunochemical Tests (FIT), Stool DNA Tests (FIT-DNA)

- **Invasive**
- Done every 3-10 years dependent on risk: Colonoscopy, Sigmoidoscopy, or CT colonography [6]

Figure 3: Image of a stool DNA test. [11]

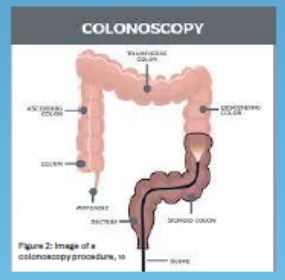

Figure 2: Image of a colonoscopy procedure. [10]

Figure 4: Image of a patient receiving IV therapy. [2]

Treatment Options

- **Surgical Resection:** First-line treatment for resectable cancer [12]
- **Chemotherapy, Radiation, Immunotherapy:** Common treatments for non-resectable cases [12]

Latest Research: Immunotherapy and gene therapies (e.g., T-cell receptor alterations, immune checkpoint inhibitors) are showing promising results [12]

Role of Primary Care During Treatment

- **Coordination of Care:** PCPs continue care by managing comorbidities, providing support during cancer treatments, and facilitating follow-up care with oncology teams [21]
- **Emotional and Psychological Support:** PCPs offer counseling, refer to support services, and monitor for treatment side effects [21]

Key Points

- 89% survival rate with early detection vs. 16% at later stages [5]
- Detecting and removing polyps early prevents cancer [6]
- Increased screening rates could reduce colorectal cancer by 22% and deaths by 33% by 2030 [5]

NAU NORTHERN ARIZONA UNIVERSITY
Office of Undergraduate Research and Creative Activity

References

Jamie L. Beuckman, College of Nursing, Northern Arizona University

Increasing vaccination rates against Human Papillomavirus (HPV) in the United States

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Purpose

- Review and evaluate barriers to high acceptance and uptake of HPV vaccination
- Examine methods of increasing HPV vaccination rates to reduce overall risk of acquiring HPV infections and subsequent HPV-related complications in the U.S.

Background

- HPV is a DNA virus with over 100 different genotypes[14]
- Remains the most common sexually transmitted infection (STI) in the U.S.[3]
- 85% of individuals will get an HPV infection[3]
- Low-risk HPV is associated with recurrent respiratory papillomatosis, condylomata acuminata lesions, verruca vulgaris, and papillomas[7, 14]
- High-risk HPV have oncogenic potential to develop into cervical, vaginal, vulvar, penile, anal, and oropharyngeal cancers[7, 14]
- Gardasil-9, a nonvalent vaccine, protects against most types of high and low risk HPV[2, 14]
- Despite efficacy and safety of this prophylactic vaccine, prevalence of vaccination in the US falls below other developed countries[2, 5]

Methods

- Resource awareness to increase healthcare accessibility, including programs such VFC[4]
- Address common barriers with evidence-based education[1, 2, 6]
  - Lack of awareness
  - Misinformation
  - Low perceived vulnerability to infection

Findings

- Burden of HPV and cervical cancer remains high in most countries, including the U.S., despite it being a largely preventable disease[10, 11, 12, 13]
- Provider endorsement remains a key determinant of HPV vaccination rates through education and addressing common misconceptions [1, 2, 6]

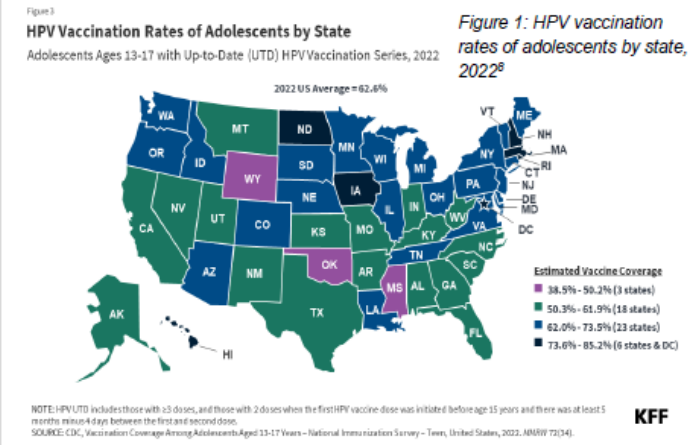

Figure 1: HPV vaccination rates of adolescents by state, 2022[8]

Summary/ Recommendation

- Ensure primary care providers (PCP) have necessary, evidence-based education on HPV and importance of Gardasil-9 vaccination to protect against low and high-risk HPV
- Increase vaccination rates to contribute to the WHO goal of eliminating cervical cancer through 90% vaccine coverage by 2030[1, 12, 13]
- Every effort should be made to overcome barriers to protect the population against morbidity and mortality of preventable HPV-associated cancers, genital warts, and respiratory papillomatosis

References

Acknowledgements

NAU NORTHERN ARIZONA UNIVERSITY
College of Nursing

THE UNIVERSITY OF ARIZONA College of Nursing

A Community Assessment of Nogales, Arizona

Andrea Roth Craig, BS, BSN, RN, DNP-FNP Candidate

Introduction & Demographics

Purpose

- This community assessment project in the city of Nogales, Arizona, seeks to comprehensively understand the community, specifically relating to healthcare resources available

Methods

- Experiential learning in collaboration with patients and staff at Mariposa Community Health Center (MCHC)
- Windshield surveys and reflections; observations in the community and along the US-Mexico border
- Publicly available data on the internet

Demographics & Economy

- Population: 19,702; 94.4% Hispanic
- Median age: 36.6 years
- Persons in poverty: 26.1%
- Median household income: $40,745
- Persons without health insurance: 24.9%
- Unemployment rate: 6%
- Land area: 20.82 square miles

Rurality & Environment

- Natural Amenities Score: 6 (maximum/best = 7)
- Average yearly temperature: 61.9° F
- Rural-Urban Continuum Code: 6 (Urban = 1 > Rural = 9)

History

- Thousands of years ago, Nogales was part of a migratory path & trade route called El Camino Real
- Two completed railroads, one international and one domestic, were completed in Nogales in 1882
- The city of Nogales was incorporated in 1893
- The Grand Avenue Port of Entry opened in 1903
- Interstate 19 allowed improved transportation by 1965
- The Arizona Mariposa Port of Entry opened in 1973

Politics & Government

- The Council-Manager form of government is established in the Nogales City Code; the Mayor is Jorge Maldonado
- City Council meetings are streamed on YouTube
- 58.77% of Santa Cruz County voted for the Democratic candidate in the 2024 Presidential Election

Transportation & Safety

- Average commute time to work: 19.8 minutes
- 4.5% of residents do not have access to a car
- 78% of residents have access to two or more cars
- No homicide or rape reported in the last two years
- Majority of crime is non-violent: burglary, theft, vehicle theft, controlled substances

Education & Recreation

- High school graduation rate: 94%
- Two sets of tennis courts
- Seven public parks
- Two public pools
- Several sports fields

Healthcare Resources

Primary Healthcare Providers

- MCHC for adults and pediatrics
- Very few other independent primary care providers

Specialty Healthcare Providers

- Dentists (MCHC)
- Ophthalmology
- Podiatry
- Cardiology, Urology, Gastroenterology, OB/GYN
- Nephrology; Dialysis center
- General Surgery

Acute Care

- Carondelet Holy Cross Hospital (ER, Imaging, Inpatient)
- NextCare (Urgent Care)
- High-level needs are transported to Tucson

Ratios	Santa Cruz County	Pima County
Patient to Primary Physician	2,229:1	1,146:1
Patient to Dentist	4,788:1	1,488:1
Patient to Therapist	2,394:1	462:1
Patient to Other Primary	3,420:1	844:1

Mental Health Providers

- Southern Arizona Behavioral Health Services
- Wellness Connections
- MCHC Behavioral Health
- Pinal Hispanic Council
- Stepping Stones Therapy PLLC
- Alliance Counseling Center
- Real Talk Therapy

Integrative Therapies

- Nogales Chiropractic and Sports Rehab Center
- Three spas – offer massage services

Rehabilitation & Social Services

- Community Medical Services – addiction services
- Carondelet Holy Cross Hospital for PT & OT
- St. Andrew's Children's Clinic: PT, prosthetics, audiology, speech therapy, vision services
- Santa Cruz County Arizona Workforce Solutions: employment agency & unemployment assistance
- Nogales Community Development: non-profit

Home Health

- Dependable Home Health

Long-Term Care

- Meadow Hills Assisted Living

End-of-Life Care

- Soulistic Hospice
- Dependable Home Health
- Casa de la Paz Hospice
- Aria Hospice Comfort Care

EMS

- Nogales Fire Department

Shelters

- House of Hope (DV shelter)
- Crossroads (homeless shelter, food pantry, addiction services)

Summary & Recommendations

Strengths

- MCHC offers primary care, behavioral health, pediatrics, OB/GYN & dental care and has an imaging center, procedure room, and pharmacy on-location in Nogales
- MCHC also offers complimentary transportation to its patients if they need assistance in getting to their medical appointments in town
- MCHC has local pharmacy delivery options for those patients who have difficulty driving or remembering to refill their prescriptions
- Santa Cruz County Health Department offers free vaccinations and Well Woman Health Check appointments (mammogram & pap) for uninsured individuals
- Southeast Arizona Health Education Center (SEAHEC) provides community health worker (CHW/Promotora) training and local capacity building to promote health & prevent disease in Santa Cruz County

Limitations

- MCHC is a massive asset to the community of Nogales in many ways; however, the primary care providers are overwhelmed with large panels of complex patients
- Limited specialty services are available in Nogales – and if they are in town, it may only be on select days of the week or month, thus limiting appointment availability
- Dentists are overwhelmed with the highest patient-to-provider ratio in Santa Cruz County; dental health is intricately linked to cardiovascular health, diabetes, healthy pregnancies, and so much more

Recommendations

- It is crucial to strengthen primary care facilities in Nogales to provide comprehensive, quality care. This could include both expanding hours of operation for increased accessibility or recruiting more physicians, PAs, and/or NPs to work at least part-time in Nogales
- Community outreach programs, led by DNPs, to educate community members on preventive healthcare, screenings, nutrition, and/or lifestyle choices could result in improved health outcomes
- Specialty healthcare providers are in high demand in Nogales. Upon recruitment with Carondelet, newly hired providers could be offered incentives to travel one day per week to Nogales – especially in demand are Neurologists, ENTs, therapists (PT/OT/ST), Endocrinologists, General Surgeons, and Orthopedic Surgeons
- The above incentive could also be offered to existing specialty providers in the Carondelet health system

References:

Pityriasis Rosea (PR): A Case Study

Rayn Dobson RN, BSN
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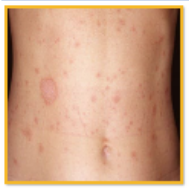
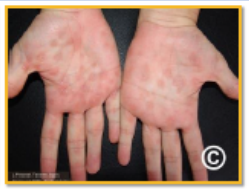
Initial Encounter

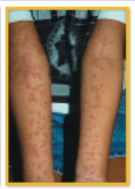
A 30-year-old male with a nonpruritic rash on the chest, bilateral arms, and hands that started 3 weeks ago. He developed a URI that preceded the development of the rash. Oval lesions were first noted on his abdomen, then spread to both arms, hands, and back. He is currently c/o of mild URI symptoms, rhinorrhea, congestion, and some fatigue.

- No PMH, no pertinent FH, and he is not taking medications.
- Vital signs were unremarkable.

Physical exam:

Oval, scaly, erythematous plaques scattered mainly across the Langer Lines of cleavage of the chest, forearms, and dorsal aspect of the hands. One distinct lesion with red, raised, scaly halo-like perimeter with pink/pale non-scaling center under the right pectoralis. No other findings were present.

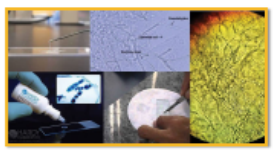





Diagnostic Testing

Most cases are diagnosed through **history and physical** [2]

KOH test for presence of fungus like that found in tinea corporis. [4,6]



Dermoscopy and Woods lamp exam can be helpful in ruling out other differentials, specifically Tinea Corporis [2]

Other Tests:

- Rapid plasma reagin or Venereal Disease Research Laboratory (VDRL) test r/o syphilis [6]
- Consider testing for HIV as a possible etiology [4,6]
- Skin biopsy is not recommended [6]

Differentials

Tinea Corporis (Ring worm)[4,6,9]

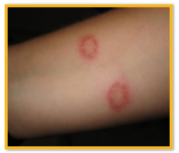
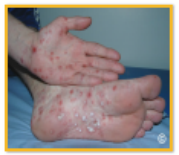
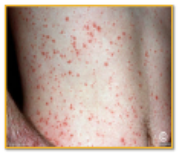
- Fungal etiology
- Scaling present throughout the entirety of the halo/ring like patch
- Usually more than one ring patch affecting the neck, trunk, and extremities
- Usually pruritic

Secondary Syphilis[2,4,6]

- Salmon colored plaques on the palms and soles
- Diffuse adenopathy
- White papules on the oral mucosa
- Wart like lesions around genitals or anus
- Patchy alopecia

Guttate Psoriasis[2,3]

- Rain drop shaped plaques on trunk
- Usually in children after a streptococcal URI

Management

Non-Pharmacological:

- Unscented moisturizers [2]
- Oatmeal bath [7]
- Protection against sun exposure [2]
- Loose fitting clothing [2]
- Avoid hot water and excessive sweating [2]

Pharmacological[1]:

- Emollients
- Antihistamines
- Low-med topical steroids: triamcinolone acetonide or prednicarbate ointment
- Med topical steroids: mometasone (Best), betamethasone dipropionate spray, hydrocortisone valerate ointment
- Antipruritic lotions containing pramoxine or menthol

Properly diagnosing PR, among a multitude of other dermatological conditions, is important to avoid inappropriate medication prescriptions and to provide reassurance to the patient or family.

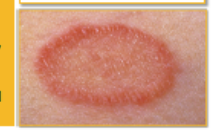
What is PR?

Background[2]:

- Self-limiting papulosquamous disorder
- Incidence of 0.5% - 2%
- Higher rates in women
- Most common in 15-30
- Viral, bacterial, non-infective, or autoimmune etiologies
- Eruptions can be seen after vaccinations, influenza, diphtheria, Hep B, pneumococcus, Covid-19, or certain medications
- Eruptions are usually sporadic, but some have been linked to exposure to other rashes
- Often preceded by a URI or URI-like symptoms
- Usual course 6-8 weeks but up to 3-6 months

Presentation:

- "Harald Patch" (50%-90% of cases) [2]
- Neck, trunk, proximal extremities along the Langer Lines of Cleavage [2]
- Scaly, or collarette scaling, oval plaque [2]
- Central salmon-pink area with red peripheral ring, 2-6cm diameter [1,7]
- Eruption can take 1-2 weeks after initial Harald Patch [1,2]
- Secondary lesions: oval, macules or papules, bilateral and have diffuse spread [1,2]
- Either non-pruritic or with severe pruritus [2]

Considerations

- Systemic corticosteroids are not usually recommended, but have been used for severe symptoms, but long-term use could lead to recurrent PR [1]
- Narrowband Ultraviolet B therapy can decrease skin immune response [2]

Follow up:

- Refer to dermatologist if there is difficulty diagnosing, non-resolving, or a complicated case. [2]
- Close monitoring from gynecologist in pregnant patients due to possible complications. [8]
- Follow-up is usually done as needed or if symptom management needs to be adjusted. [2]

References

Using the SOS Approach to Feeding and the Ketogenic Diet to Improve Outcomes in Children with Autism Spectrum Disorder

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NAU NORTHERN ARIZONA UNIVERSITY
Office of Undergraduate Research and Creative Activity

Pathology, Prevalence, and Economic/ Social Impacts

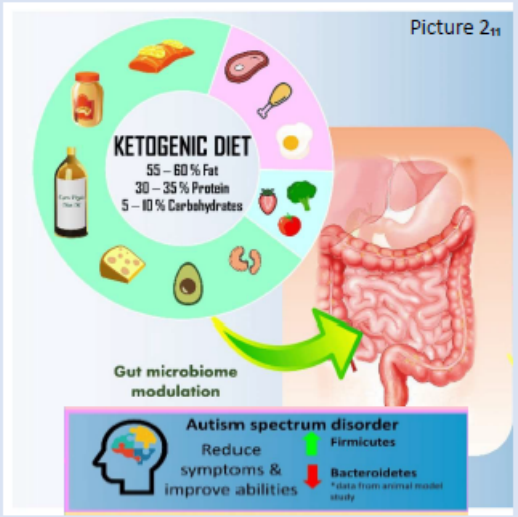
- Complicated neurodevelopmental disorder[1]
- Brain structure abnormalities, concentrations of various brain chemicals, and changes in neural networks[2]
- Characterized by both social interaction and communication deficits with changes in patterns of behavior and activity[3]
- "Epigenetic theory," suggests an irregular gene is "turned on" in early fetal development, altering gene expression[2]
- Hereditability of ASD is approximately 81%[2]
- Among males the prevalence is 1 in 23, and among females, 1 in 88, reflecting a male to female ratio of 3:1[2]
- Disproportionate access to healthcare between socioeconomic statuses[4]
- (Early) intensive behavioral intervention/treatment (EIBI), annual program costs range from $40,000 to $60,000[5]
- Many families report significant negative impacts to careers, home environment, social life, and parent-child relations[6]

Recommendations

- Keto Diet (KD) improves the typical behavioral and social/cognitive deficits typically seen in ASD[9]
- A multidisciplinary team approach including the patient, their caregivers, cultural practices, traditions, and beliefs around diet and meals, should be used[10]
- The SOS (sequential-oral-sensory) approach to feeding can improve successful implementation of KD, and further research can increase utilization[10]

Statement of the Problem

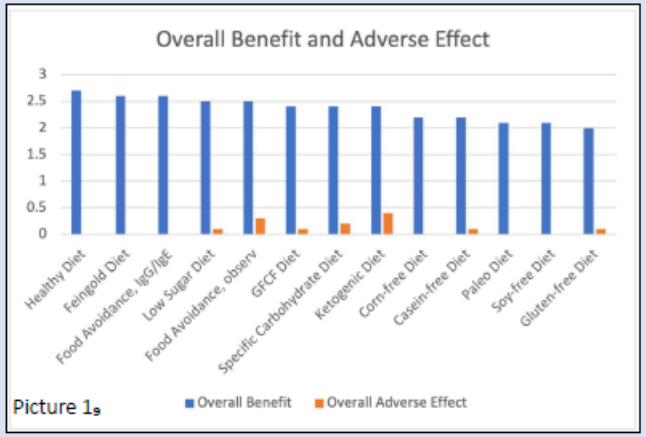
- Significant heterogeneity seen in ASD = varying success of current treatment options[2]
- ABA therapy is the cornerstone of treatment however efficacy varies widely[7]
- Varied inflammatory states and immunologic alterations[7]
- Research supports the theory that gut microbiota plays a significant role in brain development, provoking inflammatory processes within the central nervous system thus modifying neurodevelopmental brain activities, disrupting neuronal pathways, and causing the classic abnormal behaviors found in ASD[7]
- Barriers to implementation of KD treatment plan:
  - Resistance to change
  - Food sensitivities/aversions[8]



Picture 2[11]

Ketogenic Diet & ASD

- Second most researched diet for ASD[9]
- The KD diet shows promising results in response to the GI microbiota-CNS connection theory[7]
- A 2023 national survey study showed that the KD was the highest rated diet out of 13 surveyed diets for nine symptoms of ASD[9]
- 2023 RCT animal study demonstrated reduced pro-inflammatory cytokines, oxidative stress levels and gut microbiota remodeling and correlating improvement or total reversal of typical ASD behaviors in BTBR mice treated with KD.[7]



Picture 1[9]

References

Improving Competency of Polycystic Ovary Disease in Primary Care Providers

Madison Halbach, RN, BSN, FNP-S

Department of Nursing, Northern Arizona University, Flagstaff, AZ

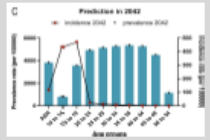
NAU Northern Arizona University
Office of Undergraduate Research and Creative Activity

Defining PCOS

- Polycystic Ovary Disease (PCOS) is the most common endocrine disorder of women of reproductive age.
- It's characterized by hyperandrogenism, chronic ovulation dysfunction, and polycystic morphology of the ovaries.

Significance

- PCOS is the leading cause of infertility worldwide.
- PCOS has a worldwide prevalence of 21%.Incidence rate of 50.5 per 10,000 person years.
- U.S. PCOS rates have doubled since 2006.
- Costs the U.S. economy > 8 billion dollars annually.



Room for Improvement

- Approximately 75% of patients in the U.S. with PCOS are undiagnosed and not receiving treatment.
- Diagnosis takes on average > 1 year and >2 providers.
- Specialists are hard to get and not required for diagnosis.
- PCPs need to increase their familiarity with PCOS and improve their comfortability with independent management.
- Timely intervention preserves fertility and reduces comorbidities.

Risk Factors

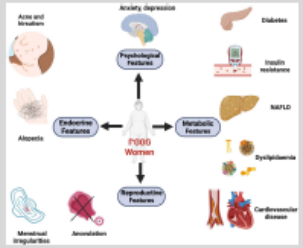
- Genetic predisposition
- Neuroendocrine dysfunction
- Obesity
- Regular exposure to chemicals.
- Family or personal history of diabetes / gestational hypertension

Presentation

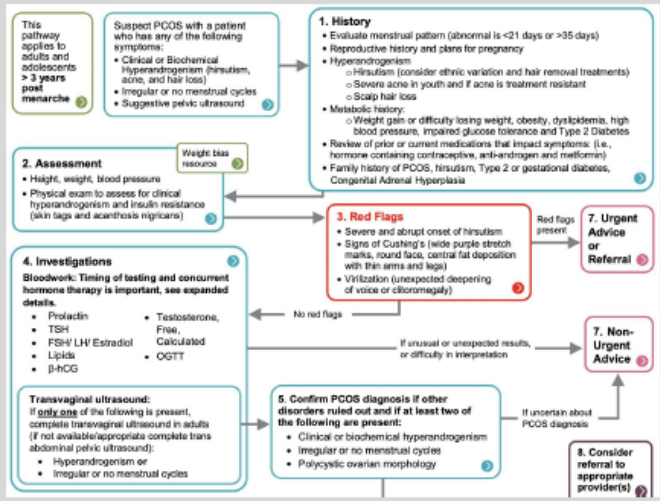
- Typical ages 15-35 years old.
- Weight gain / inability to lose weight
- Irregular menstrual cycles
- Hair loss around scalp.
- Facial hair growth / acne
- Deepening of voice.

Diagnostic criteria

- Initial diagnosis can be made with ⅔ Rotterdam Criteria.
  - Hyperandrogenism
  - Irregular Periods
  - Cysts on ovaries.
- Definitive diagnosis requires ruling disorders that mimic PCOS
  - thyroid disease
  - adrenal hyperplasia
  - hyperprolactinemia
  - androgen secreting tumors



Diagnostic pathway



Comorbidity Screening

- Poor PCOS patient outcomes are most commonly caused by the comorbidities.
- Cardiometabolic profile: serum lipids, BP log, BMI.
- Insulin resistance: Oral glucose tolerance test is the gold standard. HbA1c is secondary.
- Non alcoholic fatty liver is 3x more likely in PCOS patients.
  - Obtain serum LFTs, ultrasound if elevated.
- Obstructive sleep apnea
  - STOP-BANG symptom screening
  - Polysomnography test.
- Mood and eating disorders
  - PHQ9 and GAD7 recommended every 6 months.
  - Diet assessment, screening for bulimia and anorexia.

Current Gold Standard Treatment

6. PCOS Management: *Ask the patient about their perception of PCOS related symptoms, impact on quality of life,*

a. For all PCOS patients offer nutrition, exercise, and lifestyle counselling:

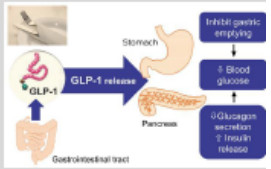
- A balanced, healthy diet following Canada's Food Guide.
- Encourage daily physical activity.
- Encourage weight maintenance, moderate weight loss, and prevent weight gain.
- Encourage reduction or quitting of smoking and alcohol use.

b. Specific symptom management

- **Menstrual regulation (amenorrhea/oligomenorrhea)**: Consider hormonal contraceptive options, metformin, and progesterone therapy.
- **Hirsutism, acne or alopecia:** Consider hair removal options, use of combined oral contraceptive pill (COCP), antiandrogens and encourage management outlined in 6a.
- **Pre-diabetes:** Consider 6a, metformin and other insulin sensitizers.
- **Fertility**: Assess reproductive plans. Determine if referral is appropriate.
- **Weight management**: Continue and intensify 6a. Addition of anti-obesity medications can be considered.

Emerging Treatments

- GLP-1 agonists
  - potential to restore equilibrium to many complex hormone pathways that are disrupted in PCOS.
  - Reduces obesity and insulin resistance common in PCOS.
  - Expensive and not covered by insurance for PCOS unless there is a true DM II diagnosis present.
- Stem Cell Injections
  - Researching is showing that stem cells can
    - increase estrogen and progesterone, decrease androgens
    - Increase insulin sensitivity
    - decreasing inflammatory markers
    - promote fertility



The Future

There is currently no cure for PCOS
The future lies in the hands of genetic researchers.

Advancements in genetic research can;

- Clarify the etiology of PCOS
- Improve time and certainty of diagnosis by producing genetic screening blood tests
- Customize treatments to genetic markers

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Holistic Health Practices and Hashimoto's Thyroiditis

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NAU NORTHERN ARIZONA UNIVERSITY
School of Nursing

Abstract

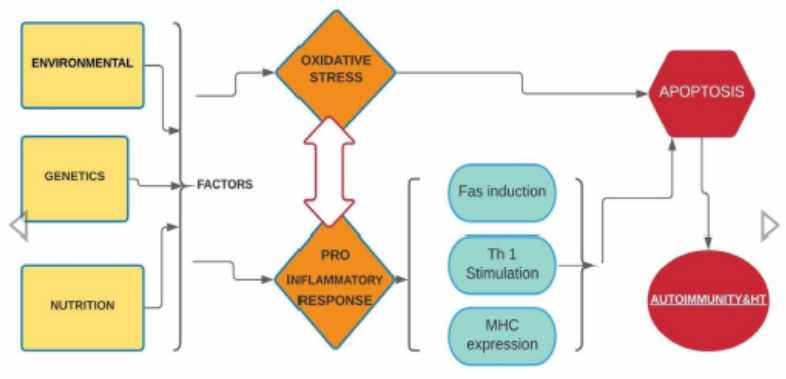
- Hashimoto's thyroiditis (HT) significantly affects women aged 25–45, presenting unique challenges such as fatigue, pregnancy, and metabolic disruptions.
- Conventional treatment (levothyroxine) addresses thyroid hormone deficiencies but often leaves symptoms unresolved and persistent high levels of antibodies.

Statement of purpose:

- To explore the integration of holistic health practices—dietary modifications, stress management, and herbal medicine—into primary care management of Hashimoto's thyroiditis in women aged 25–45 to complement conventional treatment, improve patient outcomes, and enhance overall well-being.

Methods

- Evaluation of holistic practices for HT management:
  - Dietary Interventions: Selenium supplementation, gluten-free diets, and caloric restriction.
  - Stress Management: Relaxation techniques and mindfulness
  - Herbal Medicine: Trials of Yiqi Huayu Recipe and other formulations
- Integrated with levothyroxine therapy to address both symptoms and autoimmune activity.



Results

- Dietary Changes: Reduced inflammation, improved thyroid function and TPO antibody levels with selenium and gluten-free diets.
  - Selenium found to dramatically lower TPO antibody levels
- Stress Management: Significant decrease in anti-TPO antibodies and improved well-being.
- Herbal Medicine: Lower thyroid antibodies without adverse effects, enhancing traditional treatments.

Practical Considerations

- Integration into Primary Care: Guidelines for incorporating holistic practices alongside conventional treatment.
- Patient Education: How to counsel patients on diet, stress management, and herbal medicine.
- Solutions: Addressing barriers like patient adherence and provider knowledge.
- Evidence-Based Approach: Emphasizing research-backed strategies to gain provider and patient buy-in.

Conclusion

•Holistic strategies complement conventional treatment for HT beyond conventional hormone replacement therapy.

•Addressing diet, stress, and inflammation improves patient outcomes.

•Providers should consider integrating holistic practices in an individualized plan for their patients in primary care.

•More research is needed on the impacts of holistic practices for HT

References

HPV Prevention Through Vaccination

Jennifer Jones, Faculty Sponsor: Terry Smith, FNP
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NAU NORTHERN ARIZONA UNIVERSITY
Office of Undergraduate Research and Creative Activity

Purpose of the Project The purpose of this project is to determine the importance of patient education related to HPV vaccination at an early age.

Problem While HPV vaccination rates have increased, the rates of death from HPV related cancer remains steady.[1] There remains a lack of knowledge regarding HPV, diseases it causes, and vaccination against HPV[8]

Review of the Literature

References

HPV is the most common sexually transmitted infection in the United States.[3]

Nearly every person will be infected by HPV during their lifetime.[4]

Prevalence of this infection peaks at the onset of sexual activity. Most infections go undetected as no symptoms are present.[4]

HPV is the main cause of cervical cancer.[2]

Cervical cancer is the fourth most common cancer affecting women across the world and the 6th most common cause of cancer mortality in women.[4]

In 2022, there were 14,100 new cases of cervical cancer as well as 4,280 deaths related to cervical cancer in the United States.[1]

HPV can cause cervical cancer as well as warts, anal and oropharyngeal cancers, respiratory papillomatosis, and Bowen's disease.[5]

The HPV vaccine can prevent up to 90% of cervical cancers.[1]

The HPV vaccine has been shown to be safe and can prevent up to 90% of cervical cancers.[1]

There are three vaccines available to protect against HPV. The newest vaccine, Gardasil-9, protects against 9 different genotypes of the HPV virus.[2]

HPV vaccines do not eliminate the risk of cervical cancer, as they only protect against the most common cancer-causing genotypes. Therefore, it is still important that women are utilizing other screening methods such as regular gynecological screenings which can identify precancerous lesions early.[7]

While cervical cancer remains such a prominent medical concern today, public knowledge of HPV remains low. Fortunately, HPV infections are largely preventable through vaccinations that have recently become available and approved for use.[3]

While HPV can cause many cancers other than cervical cancer, it is mainly associated with cervical cancer. Many men are unaware of the harm that HPV can cause them.[8]

Healthcare providers have cited that there is a time constraint for delivering sufficient information to patients. Many providers feel that they simply don't have the time available to educate their patients on the importance of vaccination.[6]

Only one-fifth of primary care providers recommend HPV vaccination at age 9. However, a majority stated they would be willing to begin offering this vaccination at age 9.[9]

A recent study which included recommending the HPV vaccine at age 9 showed a 15% increase in 11- to 12-year-olds who were vaccinated against HPV.[9]

Proposed Best Practice

Begin discussion of HPV and vaccination at well child visits beginning at age 9. Vaccination can be given as early as 9, but it's generally recommended at ages 11-12. [9]

This will introduce the topic and allow parents to do their own research as well as develop questions they may have.

Conclusion By introducing the HPV vaccine and providing information about HPV at an earlier age, parents and children will have more opportunities to learn more about HPV and better understand why vaccination against HPV is important, thereby increasing the rates of HPV vaccination.

Lung Cancer Screening in Primary Care

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Purpose

Applying evidence-based guidelines to increase lung cancer screening rates in primary care settings.

Background

U.S. Incidence & Mortality[4]

- 234,580 new lung cancer cases expected in 2024
- 125,070 lung cancer deaths expected in 2024

Arizona By Top Cancer Sites[3]

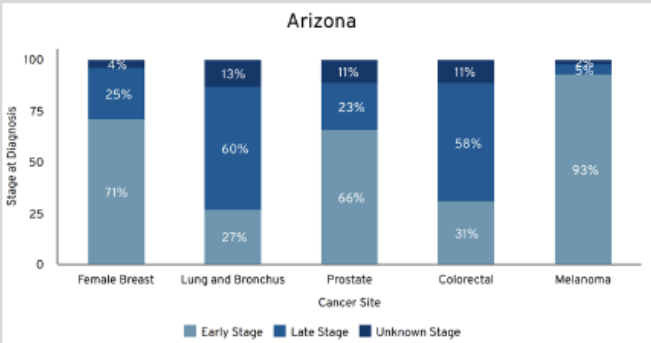
Incidence	Mortality
1. Female Breast	**1. Lung & Bronchus**
2. Lung & Bronchus	2. Colorectal
3. Prostate	3. Pancreatic

[3]

Lung and Bronchus cancer is the leading cause of cancer death in Arizona and the United States.

Stage at Diagnosis

[3]



Findings

- Most lung cancer cases diagnosed at stages III and IV[6]
- In AZ 60% of lung cancers are diagnosed at late stage[3]

➢ **AZ high-risk lung cancer screening rate 1.3%[2]**

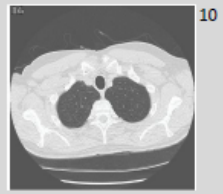
Screening Clinical Trials

European NELSON Trial[7]

- 26% reduction in lung cancer mortality in male patients and a 39% reduction in women patients who were screened with LDCT versus non-screening control group

American National Lung Screening Trial[10]

- 20% reduction in lung cancer mortality among test group screened with LDCT compared to chest radiography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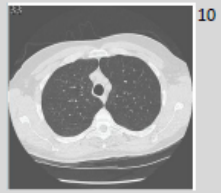
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[10]

Screening Guidelines

United States Preventive Services Taskforce[13]

- Annual low dose computed tomography (LDCT) of chest for adults aged 50 to 80 years with a 20-pack-year smoking history and current smoker or former smoker within the past 15 years

American Cancer Society[4]

- Annual low dose computed tomography (LDCT) of chest for adults aged 50 to 80 years with a 20-pack-year smoking history and current smoker or former smoker ~~within the past 15 years~~

Summary & Recommendations

- Lungs have minimal nerve sensory receptors allowing malignant tumors to grow without the patient experiencing pain or discomfort[1]
- 25% of patients diagnosed with lung cancer may be asymptomatic at the point of diagnosis[6]
- Symptoms of lung cancer may be vague and associated with many differential diagnoses and allude a low self-perceived risk among patients [1,6,12]
- Social stigma associated with smoking is a barrier to seeking lung cancer screenings[12]
- Lung cancer screening with referral for smoking cessation is associated with higher quit rates and improved outcomes[8,9]
- Increase lung cancer screening rate among high-risk patients residing in AZ from 1.3% to 6%[2]

Special Acknowledgements

U.S. Preventive Services TASK FORCE

American Cancer Society

References

Marfan Syndrome

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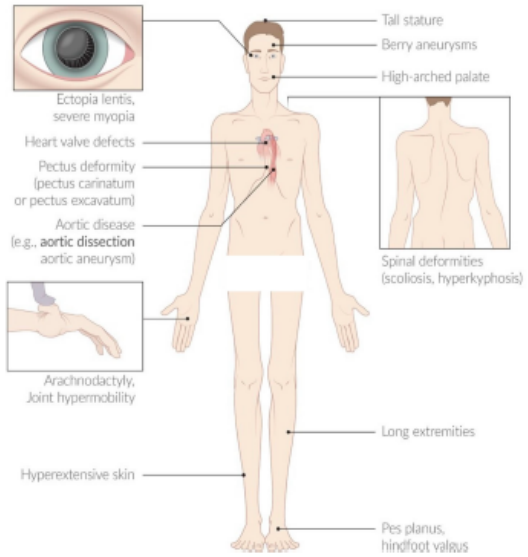
Office of Undergraduate Research and Creative Activity

Stephanie Mills, MSN, RN

Family Nurse Practitioner Certificate Program College of Nursing, Northern Arizona University, Flagstaff, AZ

Case Presentation

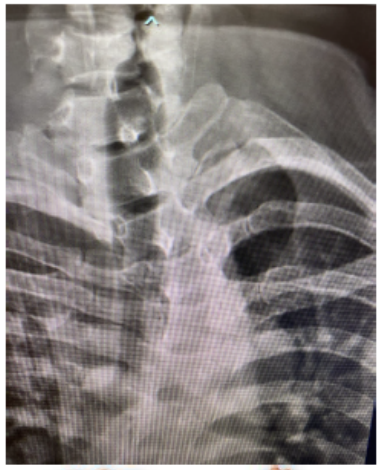
Patient J.S. was followed through a portion of his medical journey within the family practice setting, spanning approximately five clinic visits over six months including the initial consultation, diagnostic imaging, specialty provider referrals, and medication management.

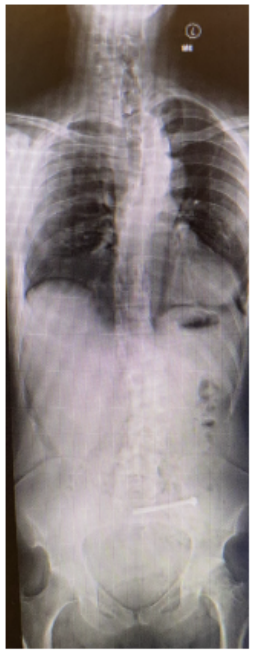


(Amboss Clinician, 2024)

- Autosomal-dominant genetic disorder affecting 1 in 3,000 to 5,000 individuals globally. [9]
- Caused by mutations in the FBN1 gene, which encodes fibrillin-1, key component of connective tissue. [6]
- Multidisciplinary care – cardiology, ophthalmology, and orthopedics with patient education to optimize long-term outcomes. [7]
- Out-of-pocket expenses often exceeding $5,000 annually. [7,8]

Patient Imaging and Testing





(Amboss Clinician, 2024)

Steinberg Sign
The thumb projects beyond the border of the ulna while completely opposed within the clenched hand

Walker-Murdoch Sign
The distal phalanges of the first and fifth fingers overlap when wrapped around the opposite wrist

Interdisciplinary Team

References

SCAN ME

Ongoing Treatment

Diagnosis

Marfan syndrome requires a thorough clinical evaluation, family history, imaging, and genetic testing for accurate diagnosis, focusing on aortic dilation and ectopia lentis.[2,3,6,9] Early detection is critical for initiating appropriate interventions and preventing life-long complications.[1,3]

Management

A multidisciplinary team (cardiology, ophthalmology, orthopedics, genetics) provides monitoring, medication, and surgery, with additional support services like physical therapy and counseling.[2,5,8,9] Personalized treatment is essential to address the specific challenges for each patient.[7,8,9]

Psychosocial and Financial Impact

Patients face psychosocial challenges and significant financial burdens due to ongoing care, genetic testing, and treatments, highlighting the need for insurance and support.[1,2,7] Emotional distress and uncertainty about the future can also affect patients' mental well-being.[7,8]

Ongoing Care

Continuous education and monitoring improve quality of life and long-term health outcomes.[3,7,8] Regular follow-up appointments and patient empowerment through knowledge are key to managing the condition effectively over time.[5,7,8]

Acknowledgements

To Patient J.S. – Thank you for allowing me to use your case as an example in my studies. Your willingness to share your experience has been invaluable and I truly appreciate your support and encouragement in allowing me to follow you through my clinical rotations.

Thank you to Christine Rocks-Lopez, FNP-C and the dedicated team at Desert Bloom Family Practice.

Charting the Course in GLP-1 RA Therapy:
Integrating Efficacy, Safety, and Patient-Centered Management

Gemavie Montaño | Northern Arizona University College of Nursing

Purpose

To introduce GLP-1 receptor agonists as a transformative drug class for managing type 2 diabetes mellitus (T2DM), obesity, and cardiovascular risk.

Rationale for Nurse Practitioners:
Emphasize the need for primary care providers to understand the complexities—from indications, dosing, side effects to patient selection—to safely incorporate these therapies into practice (Brown et al., 2021; Dungan & DeSantis, 2024).

Background

Evolution of GLP-1 Therapies:
Initially developed for glycemic control in T2DM, these agents (e.g., semaglutide, tirzepatide) have expanded to address weight management and cardiometabolic health (Drake et al., 2024).

Mechanism of Action:
They mimic endogenous GLP-1 by enhancing insulin secretion, suppressing glucagon release, and delaying gastric emptying to increase satiety, thereby reducing caloric intake (Neumiller, 2009; Kalra et al., 2021).

Research Methods & Evidence

Literature Review Approach:
The capstone synthesizes clinical trials, retrospective analyses, and FDA data to evaluate efficacy, safety, and emerging indications.

Key Findings:
- GLP-1 agonists reduce major adverse cardiovascular events and hospital admissions for heart failure (Brown et al., 2021).
- They show promising weight loss effects comparable to surgical interventions (Dutta et al., 2024).
- Ongoing research is expanding their role in conditions such as nonalcoholic steatohepatitis and neurodegenerative diseases such as Alzheimer's and Parkinson's disease, polycystic ovary syndrome, addiction management, and late dumping syndrome (Zhao et al., 2021).

Clinical Management & Patient Education

Dosing & Administration:
- For T2DM and weight loss indications: gradual dose escalation (e.g., starting at 0.25 mg for semaglutide) helps minimize side effects.
- The medication dose is administered with a once weekly subcutaneous injection.

Patient Education:
Teach proper injection techniques, discuss potential gastrointestinal side effects, and stress lifestyle modifications such as smaller, frequent meals and adequate hydration.

Clinical Pearls:
- Thyroid and Cancer History: A personal or family history of medullary thyroid cancer (MTC) or multiple endocrine neoplasia (MEN) contraindicates GLP-1 therapy; providers should palpate the thyroid for nodules before starting treatment (Dungan & DeSantis, 2024).
- Pancreatitis and Kidney Screening: Screen for pancreatitis by checking baseline amylase and lipase, and monitor kidney function (serum creatinine, eGFR) regularly, as both conditions can be worsened by GLP-1 agonists (Dungan & DeSantis, 2024).
- Retinal Evaluation: Perform a retinal exam prior to administering GLP-1 agonists—particularly semaglutide or tirzepatide—and use caution with slow dose titration in patients who have diabetic retinopathy (Dungan & DeSantis, 2024).

Clinical Management | FDA Recommendations

Medication	Ozempic	Wegovy	Mounjaro	Zepbound
Active Pharmacuetical Ingredient	Semaglutide	Semaglutide	Tirzepatide	Tirzepatide
FDA Approval	Type 2 diabetes management, cardiovascular risk reduction, and chronic kidney disease progression in adults with diabetes.	Chronic weight management and cardiovascular risk reduction in patients with cardiovascualr disease and obesity.	Type 2 diabetes management.	Chronic weight management and obstructive sleep apnea (OSA) in adults with obesity.
When to Prescribe	Recommended for patients with type 2 diabetes with cardiovascular and renal disease. In patients with diabetes type 2 and atherosclerotic vascular disease, semaglutide is recommended due to their known cardioprotective effects (Dungan & DeSantis, 2024) GLP-1 RAs may also help prevent renal complications of type 2 diabetes (Nauck et al., 2021).	Recommended for patients with obesity (BMI 30 or greater) or overweight (BMI of 27-29.9) with at least one weight related comorbidity such as hypertension, type 2 diabetes, or dyslipidemia. Patients with obesity and cardiovascular disease.	Recommended for patients with type 2 diabetes without cardiovascular or renal disease. Tirzepatide is recommended in patients with type 2 diabetes alone due to having better long term control on blood sugar levels (Dungan & DeSantis, 2024). Patients with diabetes type 2 and obesity- tirzepatide results in greater body weight reductions compared to semaglutide (Heise et al., 2023). Consider prescribing Mounjaro for improved tolerability of GI side effects, as tirzepatide shows fewer gastrointestinal side effects compared to semaglutide.	Recommended for patients with obesity (BMI 30 or greater) or overweight (BMI of 27-29.9) with at least one weight related comorbidity such as hypertension, type 2 diabetes, or dyslipidemia. Patients with obesity and OSA. When prescribed for the indication of obesity, zepbound is the recommended medication due to dual mechanism of action. It is more effective in weight reduction compared to GLP-1 receptor agonists alone (Dutta et al., 2024).
Dosing Recommendations Frequency	**Dose**	**Dose**	**Dose**	**Dose**
Starting Dose Weeks 1-4	0.25 mg	0.25 mg	2.5 mg	2.5 mg
Weeks 5-8 (If tolerating well - can increase)	0.5 mg	0.5 mg	5 mg	5 mg
Weeks 9-12 (If tolerating well - can increase)	1.0 mg	1.0 mg	7.5 mg	7.5 mg
Weeks 13-16 (If tolerating well - can increase)	2.0 m (Maximum dose)	1.70 mg	10 mg	10 mg
Weeks 17-20 (If tolerating well - can increase)		2.4 mg (Maximum dose)	12.5 mg	12.5 mg
Weeks 21+			15 mg (Maximum dose)	15 mg (Maximum dose)

Risk Factors & Adverse Events

Common Side Effects:
Gastrointestinal issues (nausea, vomiting, constipation) are most frequent and usually transient (Filippatos et al., 2014).

Serious Adverse Events:
- Pancreatitis & Pancreatic Changes: Elevated amylase/lipase levels and rare cases of pancreatitis have been noted (Filippatos et al., 2014).
- Thyroid Concerns: Preclinical studies link GLP-1 agonists with thyroid C-cell effects; thus, they are contraindicated in patients with a personal or family history of medullary thyroid cancer or MEN 2 (Bezin et al., 2023; Dutta et al., 2024).

Monitoring & Pre-Treatment Evaluation:
Screening for thyroid issues, pancreatitis history, kidney function, and diabetic retinopathy is essential before starting therapy (Dungan & DeSantis, 2024).

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Preventing Venous Wounds in Rural Patients

NAU NORTHERN ARIZONA UNIVERSITY
Office of Undergraduate Research and Creative Activity

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Purpose and Background

Purpose
To provide future family nurse practitioners and other primary care clinicians with knowledge on appropriate screening, diagnosis, and management of ulcerations of venous origin.

Background:
Venous wounds make up 70% of wounds presented in primary care.

Without proper diagnosis, treatment, and management; only 40% of wounds will attain closure within a 3 month timeframe.

Of this 40% of patients who attain closure, 80% of individuals will experience recurrence of their wound.

Financial Ramifications
The costs can range between $13,653- $18,986 per year to manage a venous wound.

American taxpayers are left to handle the $14.9 billion burden of managing these wounds.

Rural Risk Factors

Lack of access to specialty providers, insurance coverage, and lack of access to transportation can be several determinants to obtaining care.

Many wound care clinics/practices are clustered in bigger cities such as Phoenix, Tucson, and Flagstaff.

Delaying treatment can increase risk of infection, wound closure and recurrence.

Epidemiology and Pathophysiology

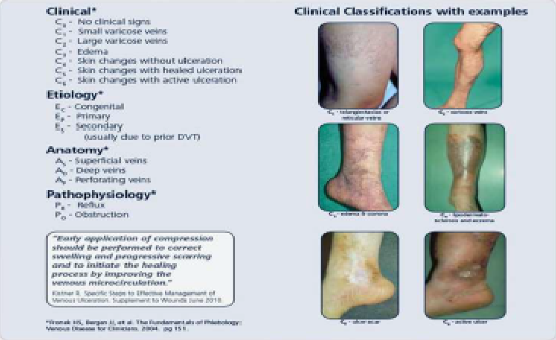
Epidemiology
Chronic venous insufficiency is usually seen in older adults but can be seen in individuals with a pertinent medical history of obesity, lymphedema, and thrombosis.

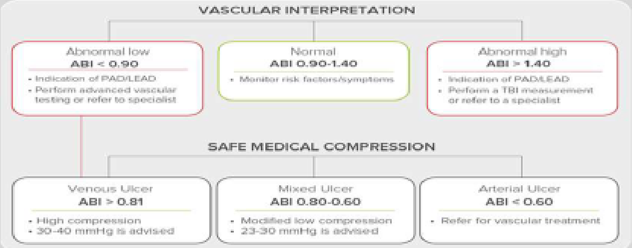
Pathophysiology
Several pathological changes that may also encompass this chronic condition include development of varicose veins, lower extremity edema due to incompetent calf muscle contraction, and deep vein thrombosis.

Other dermatological manifestations that can be appreciated on physical exam include refractory erythema, lichenification, and hemosiderin staining from stagnant and ruptured red blood cells

Over time, chronic venous insufficiency can lead to venous ulcers. These ulcers manifest over the medial malleolus of the lower leg with edges that are serpiginous, shallow wound beds where slough may or may not be present, and due to their nerve exposure, are very painful to palpation

Staging and Diagnostics

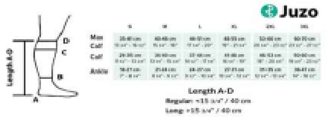

Clinical*
C0 - No clinical signs
C1 - Small varicose veins
C2 - Large varicose veins
C3 - Edema
C4 - Skin changes without ulceration
C5 - Skin changes with healed ulceration
C6 - Skin changes with active ulceration
Etiology*
Ec - Congenital
Ep - Primary
Es - Secondary (usually due to prior DVT)
Anatomy*
As - Superficial veins
Ad - Deep veins
Ap - Perforating veins
Pathophysiology*
Pr - Reflux
Po - Obstruction
Clinical Classifications with examples
"Early application of compression should be performed to correct swelling and progressive scarring and to initiate the healing process by improving the venous microcirculation."


VASCULAR INTERPRETATION
Abnormal low
ABI < 0.90
• Indication of PAD/LEAD
• Perform advanced vascular testing or refer to specialist
Normal
ABI 0.90-1.40
• Monitor risk factors/symptoms
Abnormal high
ABI > 1.40
• Indication of PAD/LEAD
• Perform a TBI measurement or refer to a specialist
SAFE MEDICAL COMPRESSION
Venous Ulcer
ABI > 0.81
• High compression
• 30-40 mmHg is advised
Mixed Ulcer
ABI 0.80-0.60
• Modified low compression
• 23-30 mmHg is advised
Arterial Ulcer
ABI < 0.60
• Refer for vascular treatment

Treatment Options

There are three mainstays of treatment for venous ulcers:

1) **Compression wrap-** therapeutic range is 30-40 mmHG, this is dependent on ABI reading and patient tolerance. Some wraps can even go up to 60 mmHG!

2. Pharmceuticals- Pentoxifylline has been used in the past to help reduce aggregation of platelets and decrease blood viscosity. Most common side effects are GI disturbances. Supplements like horse chestnut have been have been used to reduce sensations of leg heaviness and pain but the evidence on these claims are weak.

3) Surgery- The most common surgical procedures arehigh ligation vein stripping and ablation. The ablation procedure is reserved for individuals with smaller, more superficial varicosities. High ligation and stripping is reserved for more profound varicosities. The evidence on efficacy of these procedures is weak to moderate at best.

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I would like to thank my classmates and peers for taking the time to review my capstone project and listen to a subject I'm very passionate about.

How GLP-1 Medications Effect Patients and Aid in Weight Loss

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NAU NORTHERN ARIZONA UNIVERSITY
School of Nursing

Risk Factors for Obesity

- Unhealthy eating behaviors, stress, genetics, lack of physical activity, and smoking[2]
- Poor sleep habits, genetics and medications[4]
- Chronic medical conditions (DM, thyroid, heart disease, hypertension, liver disease, lung conditions, cancer, stroke, joint problems)[2]

Figure 1
Waist circumference[1]

Background

- Use of subcutaneously injected medications for weight loss increased in 2022.[6]
- Signal the brain to tell the body that the stomach is full.[4]

Three types

1) Ozempic (Semaglutide): a GLP-1 medication considered **"off label" for weight loss.**[5]
- First medication available[8]
- Manage BG control with type 2 diabetes[5]
- Lower risk of heart and blood vessel disease[5]

2) Wegovy (Semaglutide): a GLP-1 medication approved by the FDA.[5]
- Used for: **long term weight loss** with BMI > 30[5]
- BMI >27 with chronic health conditions: ↑BP, DMII, ↑cholesterol[5]
- Children > 12 with BMI in 95th percentile[5]

3) Tirzepatide (Mounjaro), a glucose-dependent insulinotropic polypeptide (GIP) and GLP-1 receptor approved by FDA.[6]
- Used for **10-15% overall weight loss**, glycemic improvement, ↓triglycerides
- GIP improves beta-cell function[9]
- Improves secretion of insulin[9], lowers Hgb A1C <6.5%[10]

Ozempic (semaglutide), Wegovy (semaglutide) and Tirzepatide (mounjaro) effectively decrease weight by 10-15% in obese patients.[19]

Figure 2
Tirzepatide Vial[13]

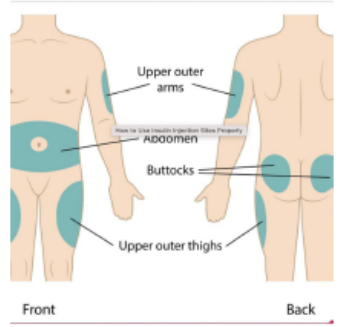

Figure 3
Injection sites for subcutaneous medication[7]

Figure 2
Semaglutide Vial[17]

Medication Shortage

- Ozempic and Wegovy became popular alternatives to lose weight in 2021; **pharmacies started running out of medication.**[16]
- Compounded incretin-based therapy was then supplied to patients from compounding pharmacies.

Cost / Benefit Analysis

- Research was done on the cost effectiveness of Ozempic versus Tirzepatide. **The compounded form of Ozempic varied from $200-$500** for a month supply, with insurance, depending on the dosage.[5]
- **The out-of-pocket cost with cash, if not covered by insurance was $932.77 per month for Ozempic, and $1349.02 per month for Wegovy.**[16]
- The cost of Tirzepatide was $1064 per month with health insurance. At $12,768 per year patients could not afford it.[18]

Practical Considerations

- Wegovy (Semaglutide) is approved by the FDA for weight loss while Ozempic is mainly used for diabetic patients.[10]
- Regular exercise, and an active lifestyle in addition to medication is beneficial.[18]
- Patients should know that the side effects are moderate or mild in severity and include nausea, vomiting, and diarrhea.[18]

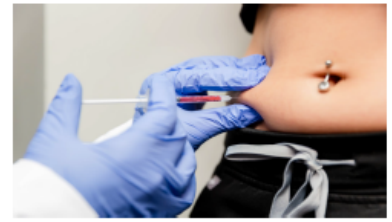

Figure 5
Injection of Semaglutide with subcutaneous needle[1]

Results

Ozempic (Semaglutide) / Wegovy (Semaglutide)

- Controls appetite and decreases energy intake through the hypothalamus and area postrema in the brain.[4]
- Increased cardiometabolic effects that included lower lipid levels, decreased blood pressure, and a lower heart rate.[4]
- Both Ozempic (Semaglutide) and Wegovy (Semaglutide) lower Hemoglobin A1C levels, protective effects of developing greater cardiovascular problems, and better glycemic control with diabetic patients.[20]

-Patients taking Semaglutide 0.5 mg weekly **lost 6 pounds over 30 weeks.** Patients taking 1 mg weekly **lost a total of 7.9 lbs. over 30 weeks**[14]

-In the first 20 weeks participants **lost an average of 10.6% body mass.** During weeks 20-68 they **lost another 7.9% body mass.**

-The placebo group gained 6.9% body mass in comparison.[16]

Tirzepatide

- Improved blood sugar control and lowered the A1C of diabetic patients.[9]
- Aided in weight loss; did not increase risk for cardiovascular events.[9]
- Improved liver fat content, reduced subcutaneous abdominal adipose tissue, and a smaller waist circumference.[19]

-Study 1: Patients took Tirzepatide at doses of 2.5 mg for 3 weeks, 7.5 mg for 4 weeks, and 15 mg for the final 4 weeks. The **average weight loss was 21.6 pounds** in comparison to the placebo group.[9]

-Study 2: Tirzepatide was injected once weekly in addition to diet and exercise.

-The participants took 10-15 mg of Tirzepatide for 36 weeks and their **weight was reduced by 20.9%.** Those that continued to take Tirzepatide for an additional 16 weeks **lost 5.5% more body mass.** The placebo group experienced a 14% weight gain.[10]

-Tirzepatide in comparison to Ozempic, was more effective in decreasing excessive body weight.[9]

References

Site Engagement for Practice-Based Research & QI: Improving Clinical Practice & Patient Outcomes

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Overview

Role of practice-based research, QI

Opportunity for clinicians and health professions students to participate in or conduct clinical site-specific projects, impacting:

Workforce development

- Statewide and national workforce shortages across multiple disciplines[1]
- Training health professions students is a critical part of workforce development
- Participation shown to impact recruitment and retention[2]

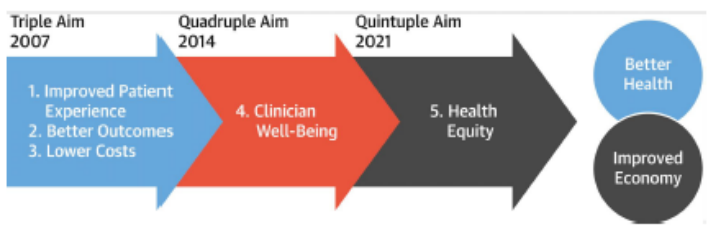
Interprofessional collaboration

- Engagement of preceptors and stakeholders in professional development

Improving outcomes

- Projects aim to improve quality or access to care, maximizing limited site resources and mitigating health disparities. Opportunity to incorporate EBP.

Consider the Quintuple Aim[3]



Practice-Based Projects

Plan-Do-Study-Act (PDSA) Model[4]

Academic Resources

- Health professions students frequently have opportunity to participate in or conduct projects at clinical sites.
- Doctor of Nursing Practice (DNP) NP student requirement

Patient Benefits

- Opportunity to evaluate practice patterns, incorporate evidence into practice, improve patient care

Leverage academic resources of doctoral programs for design, implementation, evaluation.

Quality Improvement vs Research

- QI tailored to needs of site, resources
- Ask and answer locally clinically relevant question
- Systems approach
- Design for site feasibility, sustainability

Process

Collaboration

- Engagement of site stakeholders
- ID problem and project purpose
- Project Design

Preceptor role

- Consultant
- Member, Doctoral Committee

Approvals

- Site approval for project
- University IRB – ensure human subjects protection

Implementation

- Tailored to site, considering feasibility, sustainability

Dissemination

- Executive summary of findings and future recommendations provided to site

Project Examples

Provider education - Evidence-based practice

- Chronic disease management, Mental health
- Advance directives
- Implement screening tools - depression, sleep apnea

Patient education - tools

- Chronic disease management – DM, HTN
- Prevention

Program evaluation

- Transitional care, telehealth programs

References available upon request

Prolonging the Honeymoon: Use of GLP-1 Receptor Agonists for Refractory Obesity

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Abstract

- Obesity is a chronic metabolic disorder characterized by excess energy storage, dysfunctional energy use, and disrupted hormonal feedback loops between the gut and the brain (Hollier, 2021).
- Current treatments for obesity include both medical and surgical modalities (O'Brien, 2016).
- Sleeve gastrectomy and Roux-en-Y gastric bypass are the most common surgical procedures for obesity (O'Brien, 2016).
- As obesity is a chronic, relapsing condition, 20 to 50% of patients who undergo surgery will experience some amount of problematic weight regain (El Ansari & Elhag, 2021; Noria et al., 2023).
- GLP-1 RA medications are safe and effective medications for obesity as a primary intervention and may be used as an adjunct to surgery for weight regain (Redmond et al., 2021).

Methods

- A systematic search of the available literature was undertaken to identify the prevalence of weight regain in the post-operative bariatric population and the safety and effectiveness of GLP-1 RA medications for these patients.
- Inclusion criteria included adult patients, postoperative from either vertical sleeve gastrectomy or Roux-en-Y gastric bypass, in the United States, who received treatment with a GLP-1 RA in the postoperative period.
- GLP-1 RAs reviewed included liraglutide (Saxenda, Victoza); semaglutide (Wegovy, Ozempic); and tirzepatide (Zepbound, Mounjaro).
- Exclusion criteria included age, non-English-language studies, and adjustable gastric banding or no bariatric surgery history.

Results

- There is no consensus in the literature defining a threshold for problematic weight regain after surgery.
- Jensen et al (2023) found that semaglutide could induce a loss of 63% of regained weight.
- Redmond et al (2021) compared all of the FDA-approved treatments for obesity including stimulants, antidepressants, and GLP-1s and found that only the GLP-1s produced statistically significant losses of regained weight.
- Semaglutide (-13%) was superior to liraglutide (-9%) for postoperative weight regain (Murvelashvili et al., 2023).
- None of the studies found a higher incidence of side effects when comparing GLP-1 treatment in the medical versus surgical groups.

Conclusion

A chronic, relapsing, metabolic definition of obesity is still controversial. Previously, obesity was considered a condition of sloth and excess, and its degrees were used to stratify risk, rather than being viewed as a comorbid condition in its own right. The efficacy of GLP-1 RA medications for obesity creates evidence for a metabolic dysfunction as the cause, and semaglutide and tirzepatide are now considered first-line treatments for obesity (Perreault & Reid, 2024). When a permanent intervention like surgery leads to impermanent remission of obesity or other comorbidities, proven and safe medical management can provide ongoing support to the patients who need it.

Further research is still needed in this area. Obesity researchers should work to develop a consensus on how to quantify and diagnose problematic weight regain, and to identify patients at risk prior to surgery. Further study into the pathophysiology of obesity from a biochemical, hormonal perspective could answer questions about root causes of the obesity epidemic in the United States. GLP-1 drugs are costly and often not covered by insurance for the indication of obesity, so research into cost savings through reduction in cardiovascular and pulmonary risk could change the calculations on health spending.

References

The effectiveness of lifestyle interventions in preventing cardiovascular disease

Leah Reali

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Abstract

- Cardiovascular disease (CVD) is one of the leading causes of morbidity and mortality worldwide.
- Modifiable risk factors include hypertension, dyslipidemia, obesity, smoking, physical inactivity, and diabetes.
- Economic burden: High healthcare costs associated with hospitalizations, surgeries, and long-term treatments.

Statement of Purpose

- To highlight the role of lifestyle interventions in preventing CVD and improving patient outcomes through non-pharmacologic measures.

Methods

Results

- Lifestyle interventions reduced cardiovascular disease risk by 30–50%, with benefits seen in diet, exercise, and smoking cessation (Zhu et al., 2024).
- Dietary changes, such as reducing saturated fats and increasing fiber intake, improved lipid profiles and blood pressure.
- Regular physical activity enhanced cardiovascular fitness, weight management, and glucose regulation.
- Smoking cessation significantly lowered the risk of atherosclerosis and myocardial infarction.

Conclusion

- Lifestyle interventions provide cost-effective solutions compared to pharmacological treatments.
- Prevention strategies lower the incidence of major cardiovascular events, improving quality of life.
- Socioeconomic, cultural, and psychological barriers impact adherence to lifestyle changes.
- Digital health technologies and personalized interventions improve patient engagement.

Practical considerations

- **Solutions:** Community-based programs, culturally competent care, digital health monitoring.
- **Healthcare Provider Strategies:** Motivational interviewing, education, goal-setting, ongoing support.

References

Desert Storm: Coccidioidomycosis and Its Impact on Arizona's Healthcare System

Abigail Saldana
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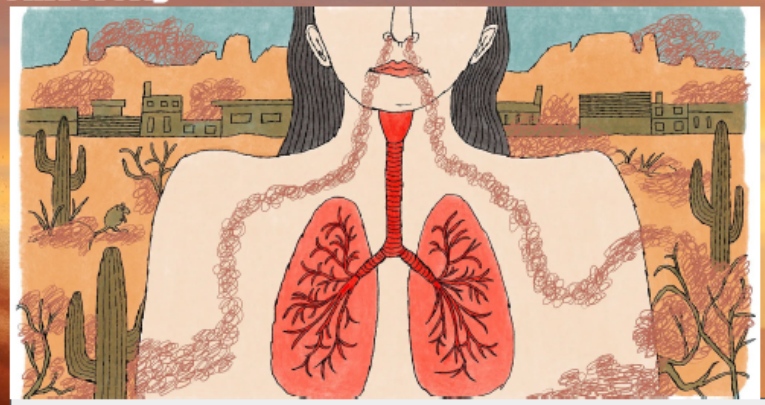
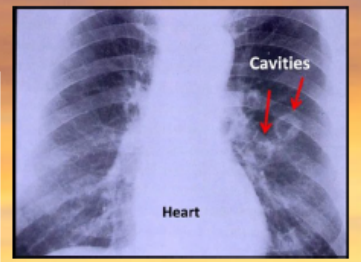
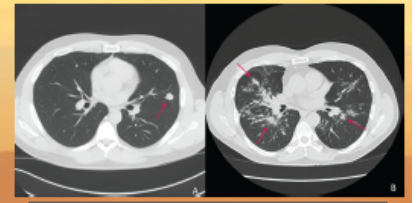
Purpose: To elucidate the challenges of diagnosing and managing Coccidioidomycosis in Arizona.







Background:

- Coccidioidomycosis, also known as Valley Fever, is caused by the inhalation of spores from Coccidioides fungi, prevalent in the southwestern United States.
- Arizona reports over 15,000 cases of Coccidioidomycosis annually, with the highest prevalence in Maricopa County,influenced by rapid urban expansion and agricultural dust disturbances.
- The economic impact of Coccidioidomycosis exceeds $736 million annually, reflecting both direct medical costs and substantial productivity losses.

Risk Factors: Environmental:

- Located in U.S. Southwest, especially Arizona and California.
- Dry, dusty climates following rainy periods.
- Exposure to disturbed soils (e.g., construction, farming).

Occupational:

- construction, agriculture, military

Individual:

- Immunocompromised status (e.g., HIV/AIDS, chemotherapy).
- Ethnic background with higher susceptibility (African, Filipino descent).
- Third-trimester pregnancy.
- Chronic conditions like diabetes.

Early Signs and Symptoms (Clinical Presentation):

- **Initial Symptoms:**
  - Approximately 60% of individuals infected with Coccidioidomycosis present with flu-like symptoms such as cough, fever, and fatigue within two weeks of exposure.
- **Imaging and Diagnostic Observations:**
  - Initial misdiagnosis rates are high, with up to 45% of Coccidioidomycosis cases initially mistaken for bacterial pneumonia, based on chest X-ray findings.

Late Signs and Symptoms (Complications):

- **Pulmonary and Systemic Complications:**
  - If untreated, 30% of symptomatic patients may develop chronic conditions, including pulmonary cavitary lesions that can persist and deteriorate lung function over time.
- **Severe Outcomes:**
  - Disseminated Coccidioidomycosis, occurring in about 1% of cases, can lead to severe meningitis, with a mortality rate exceeding 50% among untreated patients.

Outcomes if Left Untreated:

- **Long-Term Health Impacts:**
  - Studies indicate that untreated Coccidioidomycosis leads to chronic respiratory problems in 20% of cases, significantly increasing long-term healthcare dependency.
- **Economic and Social Consequences:**
  - The long-term treatment of chronic Coccidioidomycosis cases can cost upwards of $300,000 per patient, aggregating substantial economic burdens on public health resources.

Diagnosis: * Serology:

- Detect antibodies with enzyme immunoassay (EIA), complement fixation (CF), and immunodiffusion (ID) tests.
- **Sputum Culture:**
  - Cultivate Coccidioides from respiratory specimens
- **PCR Testing:**
  - Detect Coccidioides DNA in tissue or respiratory secretions, offering rapid and sensitive confirmation
- **Chest X-Ray:**
  - Identify pulmonary coccidioidomycosis through features like nodules or cavities.
- **CT Scan:**
  - More detailed imaging to assess severe or complicated pulmonary involvement

Treatment Guidelines:

- **Mild to Moderate Cases:**
  - Often self-limiting; symptomatic treatment with rest and fluids.
  - For persistent or severe symptoms, consider antifungal therapy with fluconazole or itraconazole.
- **Severe or Disseminated Disease:**
  - High-dose antifungal therapy with fluconazole, itraconazole, or amphotericin B depending on severity and site of infection.
  - Long-term or lifelong antifungal treatment may be required for immunocompromised patients or those with CNS involvement.
- **Monitoring and Follow-Up:**
  - Regular monitoring of symptoms and laboratory values to adjust therapy and manage side effects, especially in chronic or disseminated cases.

Summary:

- **Epidemiology:** Endemic to the Southwestern U.S., especially Arizona and California.
- **Symptoms:** Range from mild flu-like to severe pulmonary and systemic forms.
- **Diagnosis:** Involves serological tests, PCR, and imaging like chest X-rays and CT scans.
- **Treatment:** Symptomatic care for mild cases; antifungal therapy for severe or disseminated infections.

Recommendations:

- **Education:**
  Enhance provider awareness of symptoms and risk factors.
  - Regular training on diagnostic and treatment updates.
- **Diagnostic Protocol:**
  - Employ serological and PCR testing for at-risk patients.
  - Prompt imaging for those with respiratory symptoms.
- **Treatment Strategy:**
  Start antifungals early in severe cases or for those at risk of dissemination.
  - Monitor and adjust treatment based on response and side effects.
- **Public Health Initiatives:**
  - Strengthen disease surveillance and reporting.
  - Support research into vaccines and new treatments.

References

Irritable Bowel Syndrome- Lifestyle Management

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Abstract

Irritable Bowel Syndrome (IBS) is described as a chronic condition that affects the interaction between the brain and digestive system, resulting in persistent abdominal pain and altered bowel habits. This occurs in the absence of any other underlying disease.

The exact cause of IBS remains unknown, but several factors have been identified, such as: Abnormal intestinal muscle contractions, Disruptions in the gut-brain connection, Increased sensitivity to digestive pain, Stress and Hormonal fluctuations.

Symptoms include abdominal pain, bloating, gas, alternating patters of constipation and diarrhea, often causing severe disruption to daily living.

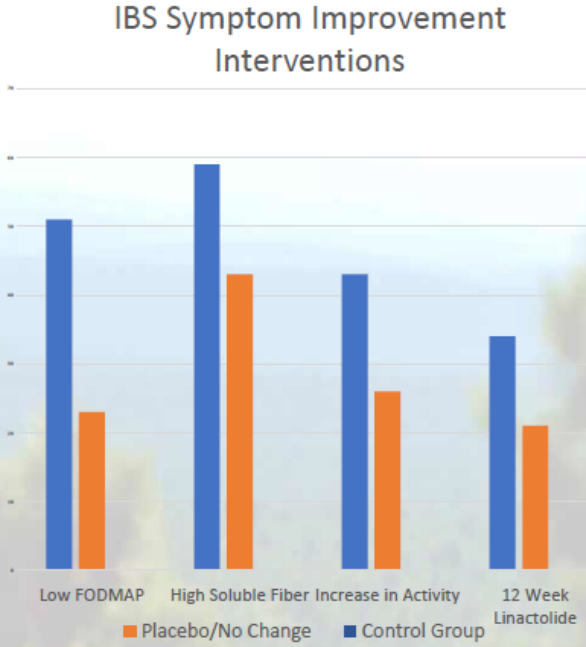
While managing IBS can be challenging, dietary changes are among the most effective strategies for symptom control.

Methods and Results

Results compare patient improvement in symptoms such as abdominal pain, gas, bloating, stool consistency and urgency based on:

Low FODMAP Diet 51% vs Moderate FODMAP Diet 23%.
92 total patients. Randomized Control Trial.
High Fiber (Soluble) 59% vs Low Fiber Diet 43%.
946 total patients. Meta Analysis.
Increase in Physical Activity (20-60 minutes of moderate intensity exercise based on pt baseline)
Increase Physical Activity 43% vs Maintenance of Current Activity 26%.
204 total patients. Randomized Control Blind Trial.
Pharmacology: 12-week course of Linactolide 34% vs Placebo 21%.
800 total patients. Randomized Control Trial.

Results



Conclusion

- **Low FODMAP to identify triggers**
  - Seek **guidance** from a **registered dietitian** to identify triggers and to **create a meal plan** that ensures proper nutrition.
  - Common triggers include wheat, dairy products, onions, apples, legumes, caffeine, alcohol, and artificial sweeteners
- **High Fiber**
  - At least 25-35 grams per day
- **Low Carbohydrate**
  - Limit or avoid all refined carbohydrates and sugars
- **Increase Physical Activity**
  - Aim for 20-60 minutes of daily activity, most days of the week.
- **Stress management**
  - Find positive ways to manage daily stress with use of yoga, meditation, crafts/hobbies, listening to music, or spending time outdoors.
- **Proper Hydration**
  - 100 oz of non-caffeinated beverages per day

Scan for References

GLP-1s:Do Good & Do No Harm

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NAU NORTHERN ARIZONA UNIVERSITY
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Abstract

FNPs face *ethical challenges as* the demand for GLP-1 receptor agonists (GLP-1RAs) for weight loss increases in primary care.

- Limited access
- High costs
- Potential prescriber bias
- Informed consent
- Ethical prescribing practices
- Obesity stigmatization

Literature Review

Beneficence (Do Good):

- Address personal bias to provide unbiased recommendations.
- Proactively treat obesity, similar to other chronic conditions.
- Utilize a multidisciplinary team for comprehensive patient care.
- Engage in shared decision-making, respecting patient preferences and concerns.

Non-maleficence (Do No Harm):

- Understand the risks of GLP-1 RAs, including potential side effects, rare complications, and proper administration.
- Offer alternative treatments when GLP-1 RAs are unsuitable.
- Exercise caution with compounding pharmacies, prioritizing patient safety.
- Consider the financial burden of medications on patients.
- Emphasize the chronic nature of obesity and the need for long-term management.

Key Findings

72.6%
CDC data from 2015-2018 percent of population 20 yrs and older overweight or obese (NCHS, 2019)

2%
Percent of US patients meeting criteria for GLP-1s currently prescribed (Brown et al., 2024)

31.4%
Percent of AZ adults 20 yrs old and up with a BMI >30.0 (USAFacts, 2023)

15%
Mean participant weight loss after 2 years on semaglutide. (Garvey et al., 2022)

22.5%
Mean weight loss @ 72 weeks on Terzepitide from SURMOUNT RCT. (Brown et al., 2024)

<1%
Risk for pancreatitis or cholecystitis from GLP-1 use. (Brown et al., 2024)

>90%
Percent of patients who continue GLP-1s despite side effects (Garvey et al., 2022)

20%
Reduction in major cardiovascular events (Lincoff et al., 2023)

10-15%
Clinically significant weight loss, associated with improved health outcomes. (Brown et al., 2024)

Recommendations

A stepwise approach to prescribing weight loss medications and managing obesity.

- Step 1: Initiate lifestyle modifications and evaluate progress after one month.
- Step 2: If lifestyle modifications prove insufficient or for patients with urgent needs, maintain lifestyle modifications and add GLP-1 RAs with regular monitoring and apparent weight loss milestones (e.g., 5% at 6 months, 10% at 1 year, 15-20% or more long-term).
- Step 3: If GLP-1 RAs are ineffective, intolerable, or unaffordable, consider a trial of alternative interventions (e.g., behavioral health), including older oral medications with ongoing evaluation.
- Step 4: If pharmacological management and lifestyle modifications are unsuccessful, consider referral for bariatric surgery.

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Social Determinants of Health in an Underinsured Population at a LGBTQ-focused Student-Run Free Clinic: A Needs Assessment

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Background

- Social determinants of health (SDOH) are well-documented in the LGBTQ+ community, including access to housing, food insecurity, insurance coverage, mental health conditions, and discrimination[1]
- Trans and nonbinary individuals have unique concerns interacting with the healthcare system d/t compounded minority stress[2]
- LGBTQ+ individuals are more likely to be uninsured and less likely to have a personal healthcare provider, i.e. losing health insurance d/t familial rejection → delayed care and worse health outcomes[3,4]
- Addressing SDOH in a clinical setting can reduce health disparities, hospitalizations, and cumulative healthcare costs[5]
- Our student-run free clinic was restarted after COVID to address the needs of the LGBTQ+ community in Tucson and increase medical student exposure to treating these populations

Objectives

1. Quantify the disparities experienced by the population seen by the LGBTQ+ student-run clinic

1. Inform future clinic leaders on unique disparities experienced by this population

1. Propose recommendations for QI projects to address underlying disparities

Methods

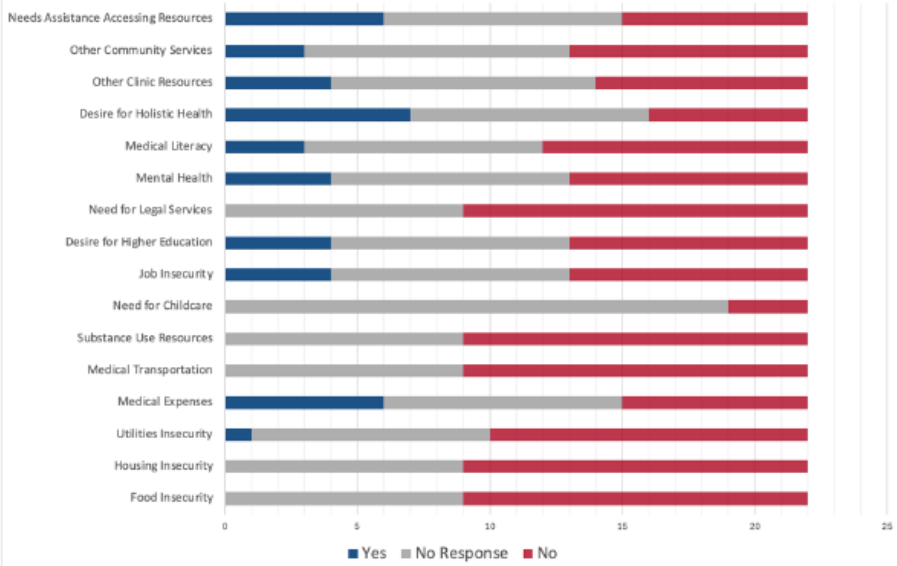
- Retrospective chart review was completed on patients scheduled for the LGBTQ+ CUP clinic between March 2023 - February 2025
- Demographic data including age, gender identity, and sex assigned at birth was collected (Table 1).
- Social determinants of health were collected via needs assessment sheet completed by each patient upon intake (Chart 1).
- Data analysis and graphing was completed in Excel

Results

Table 1: Demographic Data

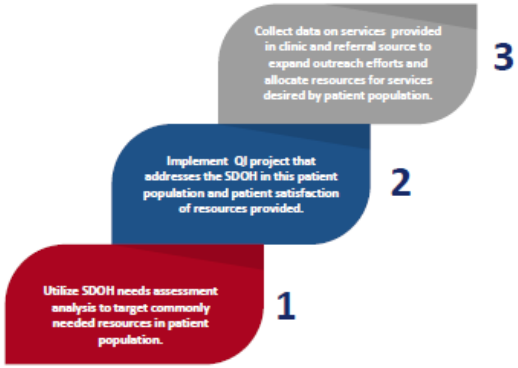
Sex Assigned at Birth	AMAB	9	**Pronouns**	He/Him	5
	AFAB	5		She/Her	5
				They/Them	1
Gender	Cis Male	3		Any	2
	Cis Female	2			
	Trans Male	2	**Age**	10-19	5
	Trans Female	4		20-29	5
	Questioning	1		30-39	3
	Non-binary	1		40-49	0
				50+	1

Chart 1: SDOH Needs Assessment



Conclusions

- Over the time period of this retrospective review (March 2023-February 2025), there has been a total of 14 new patients who received care at this clinic.
- Our patient population is made up of primarily transgender, questioning, and gender non-binary individuals (n=8) as opposed to cisgender individuals (n=5).
- The majority of our patient population who received services are in the age ranges of 10-19 (n=5) and 20-29 (n=5). As such, we serve a primarily young adult population.
- Access to holistic health services, access to community resources, and medical expenses are among the most commonly experienced disparities in this patient population.



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Urban Versus Rural Residence and the Incidence of Depression in Older Adults

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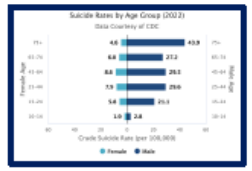
Abstract

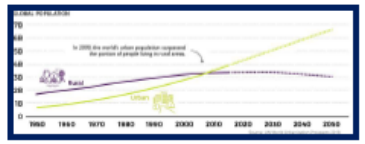
Problem: Major depression disorder (MDD) is a common and treatable mental disorder characterized by changes in mood, and cognitive, and physical symptoms over a 2-week period (Brody et al., 2018). Symptoms could consist of feeling "sad" or "blue," frequent tearfulness, loss of interest in activities (anhedonia), or anger and irritability.

Population: Older adults have a stronger association between MDD and suicide than any other age group (Purtle et al., 2019).



https://www.nimh.nih.gov/health/statistics/suicide#part_2557

Area of Interest: Between 2015 and 2050, global life expectancy at birth is projected to increase from 70 to 77 years. The proportion of the world's population living in cities increased from 43% to 54% between 1990 and 2014 and is projected to increase to 66% by 2050 (Xu et al., 2023).

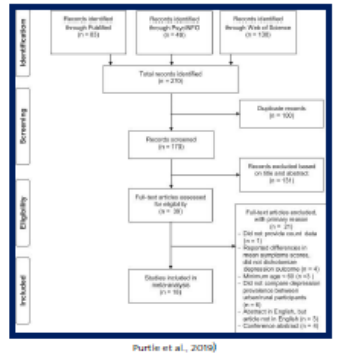


Research Question

Question: Given the recent trends in both urbanization and population aging, could rurality of residence be a risk factor for depression in older age?

Methods

Data Acquisition: A literature review was used to generate data on rural and urban residence type and co-existing rates of depression. In total, two meta-analyses and three comparative studies were included in the research.

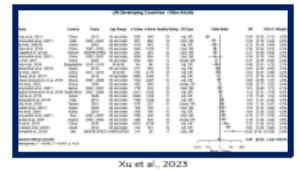


Purtle et al., 2019)

Data Limitations: Most studies were conducted in China. Specifics on population size or criteria for the basis of urbanicity was not disclosed.

Results

- Both meta-analyses concluded that depression prevalence was significantly higher among urban residents. The three comparative studies were consistent with the data collected in the meta-analyses.



Xu et al., 2023

- Variables relating to health status, personal autonomy, and social support seemed to be strongly associated with mental well-being (Alcañiz et al., 2020).
- Developing countries have higher rates of depression in rural areas (Purtle et al., 2019).
- Urban settings, with higher pace and environmental stressors, might lead for co-occurring and propagating depressive symptoms (Xue et al., 2024).
- Rural areas, characterized by close communities and proximate relationships, could evoke distinct coping strategies and resilience for depression (Xue et al., 2024).

Conclusion

- Incentivizing older people to live in rural environments could lead to greater well-being in later life (Alcañiz et al., 2020).
- Future research is needed to identify the specific factors that moderate the impact of urban living on depression and the most effective intervention strategies (Purtle et al., 2019).

https://doi.org/10.1038/s41598-024-76813-z

- The United Nations (2018) predicts that by 2050, two-thirds of the global population will reside in urban areas.
- The global trend of increased urban living has raised concerns about the impacts of urbanization on mental health (Xu et al., 2023).

References

Emerging Therapeutics Beyond Statins in Hypercholesterolemia Management

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Office of Undergraduate Research and Creative Activity

Purpose

- To explore and evaluate emerging therapies, such as Inclisiran, PCSK9 inhibitors, CRISPR-Cas9, lipid nanoparticles, and bempedoic acid, as alternatives or adjuncts to statins for hypercholesterolemia management.

Background

- Hypercholesterolemia is a major risk factor for cardiovascular diseases, contributing to 17.9 million global deaths annually.
- Statins are the first-line treatment, but limitations include intolerance and side effects such as myopathy and hepatotoxicity.
- ~38% of U.S. adults have elevated LDL-C levels, with 12% requiring medical treatment.
- Innovative therapies are necessary for patients intolerant to or unresponsive to statins.

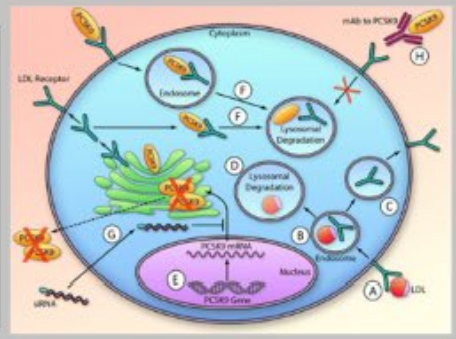
Methods

- Conducted a comprehensive literature review using MeSH terms like "hypercholesterolemia," "Inclisiran," "PCSK9 inhibitors," and "CRISPR."
- Analyzed data from clinical trials (e.g., ORION-9, ORION-10, ORION-11) and peer-reviewed studies.
- Evaluated therapies based on LDL-C reduction, safety, and patient adherence potential.

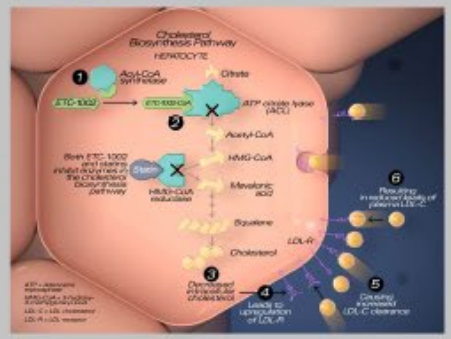
Results

- Inclisiran
  - Reduces LDL-C by ~50% with two annual doses.
  - Targets PCSK9 expression, increasing LDL receptor recycling.
- PCSK9 Inhibitors
  - Reduces LDL-C by up to 60%.
  - Effective for patients with familial hypercholesterolemia and statin intolerance.
- CRISPR-Cas9
  - Promising for genetic hypercholesterolemia; correct mutations in LDL receptor genes.
  - Experimental with potential safety concerns.
- Bempedoic Acid
  - Reduces LDL-C by 20–30%.
  - Minimal muscle-related side effects, suitable for statin-intolerant patients.
- Lipid Nanoparticles
  - Improve targeted drug delivery for cholesterol reduction therapies.

Inclisiran



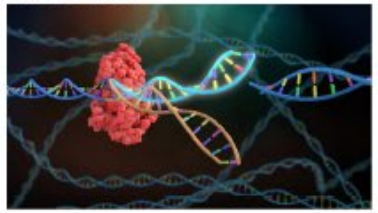
Bempedoic acid



Conclusion/Recommendations

- Emerging therapies provide effective alternatives to statins, with significant LDL-C reduction and improved adherence. However, challenges like cost, accessibility, and long-term safety need resolution. Continued research is essential to integrate these innovations into routine practice and improve cardiovascular outcomes.
- Incorporate novel therapies for statin-intolerant or high-risk patients.
- Address cost and accessibility issues to improve widespread adoption.
- Promote further research to evaluate long-term safety and cardiovascular outcomes.

CRISPR-Cas9



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