Combating Loneliness and Social Isolation Through Technology Solutions

ASU Summer Institute | September 3, 2020

PRESENTED BY:

Sandra Stein, MD
Medical Director for Complete Care, Banner Health Network

Cindy Jordan
CEO and Founder, Pyx Health
Meet the presenters

Sandra Stein, M.D.

Sandra Stein, M.D. has been the Medical Director for Complete Care at Banner Health Network in Arizona since October of 2017. Prior to this position Sandra served as the Chief Medical Officer for Intermountain Centers in Arizona, and the Behavioral Medical Director for the Arizona Comprehensive Medical Dental Program (CMDP)/State of Arizona Department of Child Safety (DCS). Notably, Dr. Stein served for 18 years as a Medical Director for the Community Partnership of Southern Arizona (CPSA), the Regional Behavioral Health Authority (RBHA). Dr. Stein graduated from Albany Medical College in New York state in 1992 and completed an internship, general psychiatry residency and child psychiatry fellowship at University of Arizona Health Sciences Center in Tucson, Arizona in 1997. She is double board certified in general and child and adolescent psychiatry.

Cindy Jordan

There aren’t many entrepreneurs whose careers include being a police officer, presidential campaign fundraiser, and founder of two healthcare IT startups, one of which led to a successful multi-million dollar exit.

Pyx Health is the first loneliness and social isolation technology focused on helping the most vulnerable. By combining Artificial Intelligence and compassionate human interventions, Pyx Health offers patients and healthcare providers an innovative, scalable solution that effectively addresses this U.S. health epidemic. Research from Banner Health shows that Pyx Health is working - after using Pyx Health for six months, 93% of users report feeling healthier and Banner Health saw a net 46% reduction in inpatient spend.
Learning Objectives

1. Identify a new way of approaching member engagement: strategies and applications for a member centric, member driven approach to supporting members in their times of need.

2. Discover how real-time knowledge of members thoughts, moods and needs impacts a plan’s actions and changes patient outcomes.

3. Observe how addressing key healthcare issues such as social determinants of health, social isolation and loneliness, anxiety and depression are related to positive outcomes associated with implementation and reduced inpatient utilization.
BUHP

- We have participated as an Arizona-based managed care plan since 1985
- Rooted in AZ, the only AZ-based provider-owned Medicaid (AHCCCS) health plan
- Began to fulfill UA Department of Family and Community Medicine’s desire to provide a patient base for teaching purposes
- Community focused: mission driven, non-profit
- Have ACC, ALTCS and DSNP plans-enrollment below

BHN

- Clinically Integrated Network (CIN) and Accountable Care Organization (ACO)
- Coverage in Arizona’s Maricopa and Pinal counties
- More than 400,000 BHN members and beneficiaries, including Banner employees
- A comprehensive array of services and providers including:
  - 5,000+ physicians and advanced practitioners
  - 28 Banner Health hospitals, including Banner MD Anderson Cancer Center, Cardon Children’s Medical Center, Banner BH hospital and 3 academic medical centers
  - 47 Banner Urgent Cares
  - Lab, Surgicenter, hospice, home care, and additional clinical services

<table>
<thead>
<tr>
<th>Product</th>
<th>Focus</th>
<th>Approx. Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banner-University Family Care</td>
<td>Complete Care/Integrated (formally Acute)</td>
<td>241,000</td>
</tr>
<tr>
<td>Banner-University Care Advantage</td>
<td>Dual Eligible Special Needs Plan (DSNP)</td>
<td>15,500</td>
</tr>
<tr>
<td>Banner-University Family Care</td>
<td>Arizona Long Term Care System (ALTCS)</td>
<td>6,600</td>
</tr>
</tbody>
</table>
In a sea of solutions...

WHY WE CHOSE PYX HEALTH

• Competitive Arizona Medicaid/AHCCCS bid focused on Complete/Integrated Care
• Historical strategies with complex members left opportunities for redesign and enhancements
• Tremendous amount of community input from think tanks, etc.
  • Identified a need to do something different!
  • Leverage technology to drive innovations and outcomes
• Desire to have real time solutions, when members need help!
  Member centric, member driven approach!
• Desire to focus on maximizing natural supports
• Address social isolation and loneliness proactively
• Ultimate goal: Achieve the quadruple aim!
90% of health-related issues happen outside of the traditional care setting.
How do we address loneliness to improve health outcomes?

Loneliness affects everyone.

The New York Times

“...associated with a reduction in life span similar to that caused by smoking 15 cigarettes a day and even greater than that associated with obesity.”

AARP

“...over one-third of adults in the US are chronically lonely – meaning more than 2.6 million of them may suffer from ongoing loneliness.”

“Among midlife and older adults earning less than $25,000 per year, 50% are likely to be lonely.”

BECKER’S HOSPITAL REVIEW

“...found that 80 patients accounted for 5,139 ED visits in one year, at an estimated cost of $14 million... loneliness as the number one factor for these ED visits...”

“...loneliness potentially increases a person’s risk of mortality by 45%. That statistic makes loneliness more dangerous than air pollution, obesity and excessive alcohol use.”

How do we address loneliness to improve health outcomes?
Who is Pyx Health?

- A first-to-market technology that offers a scalable loneliness and social isolation solution for healthcare organizations

- Provides 24/7 companionship and support for patients via a mobile app and compassionate call center

- Screens for anxiety, depression and SDOH allowing time sensitive interventions/supports

- Combines Artificial Intelligence and compassionate human interventions to serve patients who have historically been forgotten by technology - Medicaid and Medicare patients.
Our mission is to tackle loneliness, when it matters most, for everyone who needs it.

Pyx Health
WELCOME TO PYX HEALTH
Pyx Health Tenets

Intentional Delivery

Building Trust

Artificial Intelligence & Human Interventions
Andy will onboard Janet over the phone – 67% of the time a member is onboarded on the first call.
Pyx Health Tenets

Building Trust

Intentional Delivery

Artificial Intelligence & Human Interventions
Hi Janet!

Hi Pyxir! 👋

This made me smile today!

Cute!

Member Journey
Building Trust

Pyxir will establish a trusted connection with Janet and support her 24/7.
Member Journey
Building Trust

Once Pyxir establishes trust with Janet, he helps her complete necessary screenings around wellness, loneliness and social determinants of health.
Pyx Health Tenets

Building Trust

Intentional Delivery

Artificial Intelligence & Human Interventions
Member Journey
AI + Human Intervention

If Janet scores lonely or identifies another urgent need, Andy will reach out to provide support and resources.
Sustained engagement as a key metric is problematic

Study used machine learning to describe engagement among 54K users of a digital cognitive behavioral therapy tool during a 14-week program

**HYPOTHESIS**
Distinct, heterogenous patient behavior subtypes are associated with the tool’s success (improvement in mental health); and different subtypes of engagement are related to different clinical outcomes

**FINDING**
Clinical outcomes were not uniformly proportional to the amount of time patients spent with the intervention. Different types of engagement with the content among behavior subtypes

**EXAMPLE**
Mean depression score decreases were greatest among high engagers with rapid disengagement (high app usage, felt better, stopped using)
Implications of JAMA study

Although it is essential to take a longitudinal perspective with engagement and examine use over time, duration of use itself is not a reliable indicator of engagement.

Studies in human-computer interaction have shown that it is difficult to disambiguate negative, frustrating experiences with technology from positive, absorbing ones based on this measure, and that a person’s willingness to return is more telling of engagement.


BOOMERANG USERS
37% of Pyx users who put the app down after a period, will come back as regular users within 12 months
Launching Pyx Health into our organization

We selected our most complex/vulnerable Medicaid/AHCCCS members
Focused initial implementation on the following:

- Transitions: DC from BH and PH hospitals and BH Residential Facilities (BHRFs)
- High cost, high risk members through care management
  - Supplement to traditional care management as well!
- Members with or at risk for anxiety, depression, loneliness, SDOH
- Provider member engagement as a supplement to traditional services
  - Critical piece to support efficiency!
- Social distancing associated with Covid-19-A natural solution!
  - Social distancing does not have to turn into social isolation
  - Prime opportunity to leverage technology!!!
- Risk of anxiety, depression, SDOH needs associated with Covid-19
  - Real time supports and timely coordination with health plan and provider
- Now exploring focus on ED overutilizers
BUHP member data
Screening Results

**Key Takeaways**
- Members are identifying significant clinical and support needs through the platform including high scores of anxiety, depression, loneliness and multiple SDOH needs.
- Information can be shared with BUHP Care Management and providers.
- Timely coordination and member support.

* UCLA, SDOH, PHQ-9 and GAD-7 are scheduled to each be completed at least 1x/month based on activity and time on the platform. Monthly cadence is UCLA, SDOH, PHQ-9 and then GAD-7.
When members score high on the UCLA, Pyx team of Andy’s reach out for a companion call.

Here is one member’s story:

A BUHP member scored an 8 on the UCLA. She suffers from major depression and has been having a hard time with her living situation lately. She is in a long-term relationship (2.5 years) and they have roommates. Her BF is a social person and loves having friends around. She finds herself spending a lot of time in her bedroom just going to sleep in order to cope with her sadness. She does have a therapist she sees biweekly and she does have self care techniques.

She talked with her Andy for 20 mins about life and was happy to realize that there was another resource available and that she will use it as needed.

She has made additional calls to Andy and engages in the platform a few times a week. Lately, her mood reading have been much more positive and happy!

Key Takeaways

Members are struggling with loneliness. Elderly may have significant increased risks. Technology/ PYX- innovative solution!
BUHP SDOH needs - breakdown

### SDOH Needs Assessment

<table>
<thead>
<tr>
<th>Category</th>
<th>Affirmative responses</th>
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<tr>
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<td>Employment</td>
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<td>Safety</td>
<td>54</td>
</tr>
<tr>
<td>Health Literacy</td>
<td>13</td>
</tr>
</tbody>
</table>

When members indicate an urgent SDOH need, the compassionate call center reaches out.

Here is one member’s story:

Member indicated in the platform that he was struggling with food after the expenses of moving into a new place. Our compassionate call center reached out and connected the member to resources, checking back in with him a few days later to ensure he was doing ok.

A few months latter, the member again indicated an urgent SDOH need in relation to income as he had just lost his job. The call center helped connect him to the food pantry and the Tucson Urban League Pyx also connected with OIFA at BUHP and they were able to help the member get into a job training program. They have since closed out his case as he is now successfully employed!

Key Takeaways

Food, housing and employment are the predominate urgent needs for the BUHP population.
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<th>GILA</th>
<th>GRAHAM</th>
<th>LA PAZ</th>
<th>MARICOPA</th>
<th>PIMA</th>
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<td>Income</td>
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<td>Transportation</td>
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<td>60</td>
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<td>4</td>
<td>86</td>
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</table>

**Grand Total**

52 12 23 3 109 868 49 8 88 1212

**Key Takeaways**

Employment, Food, Income, and Housing are the top SDOH needs of BUHP members, which holds true in all counties served.
Young female in Pima County scored highest score for lonely on the UCLA-3

She has indicated 4-6 SDOH needs over the last 3 months

The member indicated an urgent SDOH need and responded affirmative to the following categories:

<table>
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<tr>
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<td>Transportation</td>
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The compassionate call center has contacted the member 6 times. She needed help with housing, employment and childcare. She has a young son and is couch surfing.

One their first call, her Andy referred her to a local behavioral health agency and provided instructions on how to apply for housing. They walked through ensuring she had food stamps and a place to stay for the night. Andy contacted Colleen from OIFA for a warm hand-off.

On a follow-up call, the member wanted to share that they found employment! She was still struggling with housing, so Andy reached out to the housing liaison at OIFA and facilitated another referral.
Arizona Medicaid/AHCCCS case study roadmap

01 Initial Study
July 2019
81 Pyx / 200 Control Group

02 Follow Up Study
March 2020
417 Pyx / 2175 Control Group

03 Expanded Cohort
Sept. 2020
Minimum 500 Pyx / 2500 Control Group

Future
• **Participants:** 81 Pyx Health User Group vs. 200 Medicaid Non-User Control Group

• **Timing:** 12 months of data

• **Criteria:** Continuous Enrollment

• **Claim Status:** Final/paid claims

• **Focus:** Cost savings & utilization
Does Pyx Health *actually* improve outcomes?

**Average Inpatient Cost/User for 6 months**

- **6 Months Prior**
  - Pyx User: $6,312.48
  - Control Group: $7,171.25

- **6 Months Post**
  - Pyx User: $2,707.30
  - Control Group: $6,409.39

**% Reduction of Total Dollars***

- **6 Months Prior**
  - Pyx User: 11% Reduction
  - Control Group: 57% Reduction

*Planned admissions and maternity stays are excluded from this analysis
Inpatient stays in Arizona for Medicaid members are paid on a DRG format using condition, age, gender, principal diagnosis and procedure to base pricing. Additional payments may be made for rural hospitals and special circumstances.

Inpatient Stay Before vs After

Pyx Cohort: $511,310.81
Control Group: $1,434,250.13

Pyx Health users saw a total savings of $281,090.47 in just 6 months

Cost Savings
- Saving $3,470 per member

89% of your members say they go to the Pyx Health app when they need help.
93% of your members reported that they feel healthier after just 30 days of using the app!
65% of your members reported that the app made them feel more connected to their healthcare team.

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Inpatient stays in Arizona for Medicaid members are paid on a DRG format using condition, age, gender, principal diagnosis and procedure to base pricing. Additional payments may be made for rural hospitals and special circumstances. [Link](https://www.azahcccs.gov/PlansProviders/Downloads/FFSProviderManual/FFS_Chap11_Addendum.pdf)
The Follow Up Study expanded both the Pyx User Group as well as the Control Group.

Attributes
- Chronic Diseases
- Hospitalization Stays
- Inpatient Stays
- Expected Future Cost
- Race
- County
- Age
- Sex
- Plan Tenure
- Line of Business
- Claims Utilization
- Pharmacy Utilization

A random machine learning model was used to match Pyx users to up to 10 members of the control group based on the attributes available in claims data.
Pyx members are statistically less likely to return to the hospital within 3 months

Pyx users in the second study had a 36–53% reduction in a hospitalization event occurring within 3 months after Pyx encounter.

The average cost reduction for Pyx users is 6.2% in just 3 months.

P-value near 0 indicating a strong statistical significance.

Pyx users had 11% less readmissions than the control group.

Admits to hospital within 3 months

% of members who readmitted to the hospital

- Pyx User
- Control Group

- 24%
- 13%
- 0.00%
- 10.00%
- 20.00%
- 30.00%
- 40.00%
- 50.00%
- 60.00%
- 70.00%
- 80.00%
- 90.00%
- 100.00%
Pyx is making a difference!

Increasing the sample size and duration of claims analysis between the two studies has continued to show very positive trends in reduction of readmissions for Medicaid/AHCCCS members. The study demonstrates positive outcomes:

- Reduction in hospitalization rates for Pyx users with a strong statistical significance.
- While users in both the Pyx User group and the Control group show decreased utilization in inpatient stays, the Pyx group had a much lower rate of readmission than the control group.
- Cost is difficult to quantify with small datasets due to high variability. More members would have to be enrolled to find savings with more certainty see comment.
“We should use the quiet of these suddenly uncrowded days to think a little about how much we’ve allowed social isolation to grow in our society, even without illness as an excuse… Loneliness turns out to be a huge factor in diminishing human lives.”

The New Yorker
Banner Health Network expansion

Positive outcomes for BUHP implementation and Covid-19 drove decision to expand to BHN

Swift to market implementation: Decision April 2020 >>>> Launched May 2020

Current: • Target members – Commercial Medicare
  • Observing differences in need with the Medicare population
    • Loneliness and more needs around access to care and DME
    • Access to and adoption of technology
    • 30+ minute calls (sometimes twice the average call time of previous populations)

Future: Plans to expand targeted outreach to additional populations such as high ED users and employee plan members
BHN Has 210 Pyx Members!

- Female: 126, 62%
- Male: 66, 33%
- Other: 5, 4.2%

Female to male ratio is 2 : 1

- Largest population of 65+

- On track to hit 215 members by end of month
Member Enrollment Continues to Grow!

BHN Member Onboarding Total

Running Total

Apr-20 | May-20 | Jun-20 | Jul-20 | Aug-20
---|---|---|---|---
10 | 57 | 114 | 155 | 210
Members are using the platform a lot!

Key Takeaways

75% of all members are choosing to spend additional time in the platform engaging in meaningful content.
BHN Member Data
Screening Results

### Key Takeaways
38 BHN Members completed the GAD-7 or PHQ-9. We have seen members reporting significant support needs when completing screenings.

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When members score high on the UCLA, our team of Andy’s reach out for a companion call.

Here is one member’s story:

A 70-year-old BHN member has been using the platform for over 3 months and has consistently scored lonely on the UCLA-3. Each time the compassionate call center has reached out and talked with the member in a companion call. Our call center also checks in on the member every few weeks to say hi and see how he is doing.

Though married with a young adult child in the home, he struggles with feeling connected in his community. Each call with the member resulted in positive mood and wellness readings over the following days and covers topics such as his coping skills, DIY projects he is working on, his health, and resources available to him.

The members always reports how much he appreciates the calls and chatting with Pyxir. Often relating a funny gif or joke that he found amusing.

Key Takeaways

35% of screenings completed by BHN Members are indicating support with Loneliness. We are also seeing members who do not have smart phones needing support by our Compassionate Call Center.
BHN SDOH Needs - Breakdown

SDOH Needs Assessment

What Resource Types are Members Reporting Needing Help With?

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Count of Affirmative Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>9</td>
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<tr>
<td>Follow Up</td>
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<td>Income</td>
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<td>1</td>
</tr>
<tr>
<td>Childcare</td>
<td>1</td>
</tr>
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</table>

Key Takeaways  28% of respondents identified needing assistance with more than one SDOH need.
In summary...

- Technology solution that’s helping us achieve the quadruple aim
- Member-centric, member-driven: Supporting members in real time, when they need help; gathering info about their mood and wellness
- Encouraging self-management and natural supports
- Proactive solution to address social isolation, loneliness and SDOH
- Timely support for Covid-19 related anxiety, depression and loneliness
- Successful implementation strategies
- Minimal provider burden; provides supports to traditional case management and services
- Support for traditional health plan care management
- Positive health outcomes + member satisfaction= reduced costs
- Further expansion coming!
A lack of social contacts among older adults is associated with an estimated $6.7 billion in additional federal Medicare spending annually. (AARP 2017)

If we treat the loneliness, we improve medical outcomes and, in turn, reduce spending. Using technology enables a scalable solution that makes helping more people, more attainable.
You have no idea how good it felt today to answer the phone and have someone ask me, ‘How are you feeling today?’. It felt like I really do have friends.

Oh my god I love that little robot. Every time I open the app he makes me smile! That cannot be a computer speaking to me because he sounds so human!