

Does Telehealth Really Tele HELP?

CHECK-IN CODE: 3003

Does Telehealth Really Tele HELP?

A DATA-INFORMED STRATEGY TO IMPROVE HEALTH OUTCOMES FOR
INDIVIDUALS WITH COMORBID SMI AND CHRONIC MEDICAL
CONDITIONS

Disclosure to Learners

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Objectives



EXAMINE HOW USE OF TELEHEALTH TECHNOLOGY IN A POPULATION WITH COMORBID SERIOUS MENTAL ILLNESS (SMI) AND DIABETES IMPACTS ENGAGEMENT AND HEALTH OUTCOMES.



EXPLORE HOW EXPANDED USE OF TELEHEALTH TECHNOLOGY CAN BE COLLABORATIVELY LEVERAGED IN AN INTEGRATED CARE SETTING.



EXPLAIN HOW TO ADDRESS INTERNAL AND EXTERNAL BARRIERS TO IMPLEMENTATION OF TELEHEALTH TECHNOLOGY WITHIN AN INTEGRATED CARE SETTING.

Background

While some of the highest morbidity and mortality rates due to chronic disease persist in Texas, the situation is worse still for residents with Serious Mental Illness (SMI).

The even higher rates of co-morbid chronic medical illness in people with SMI, the unique challenges they face managing their illnesses, and their disproportionately high rates of premature death relative to the general population are well documented.



Texas BRFSS (2021)

- 11.5% (Diabetes)
- 36.1% (BMI > 30.0)
- 18.6% (Depressive Disorders)
- 32.2% (High Blood Pressure)

Background



Tropical Texas Behavioral Health (TTBH) is a Certified Community Behavioral Health Center (CCBHC) and Local Mental Health Authority (LMHA) for the region in South Texas known as the Rio Grande Valley and is composed of 1.3 million residents, with about 90% Hispanic population.

To address the high prevalence, and associated risks, of diabetes, prediabetes, and obesity, TTBH implemented a grant funded project with a focus on those with comorbid SMI and chronic medical conditions.

Project Overview

The project's focus was on clients who reside in the mid-Valley who were diagnosed with a SMI and comorbid Type 2 Diabetes or Pre-Diabetes, among other chronic conditions. In addition to program specific interventions, clients continued to receive outpatient behavioral health services in accordance with assessed need.



Integrated BH & PC



↑ Virtual
Touchpoints



↑ Telehealth
Visits



Assigned Remote
Monitoring Device



Glucometer



Sphygmomanometer



Scale

Program Participants

Data for analysis was pulled from an ongoing evaluation and quality improvement program. Included within the sample were individuals who received program services for greater than six months; those with incomplete data were excluded.

| Program Participants N=90 | | | | | | |
|------------------------------|----------------------|-------------|--------------|-------------------------|--------------|-------------|
| Sex | 44% Male | | | 56% Female | | |
| Age (years) | 1% 18-24 | 9% 25-34 | 26% 35-44 | 43% 45-54 | 17% 55-64 | 4% 65-74 |
| Ethnicity | 94.4% White Hispanic | | | 5.5% White Non-Hispanic | | |
| Preferred Language | 64.4% English | | | 35.6% Spanish | | |

Program Participants

| N=90 | MDD | Schizophrenia | Bipolar D/O |
|----------------------------|-----|---------------|----------------|
| Diabetes Status | | | |
| DM2 | 44 | 3 | 8 |
| Pre-Diabetes | 27 | 3 | 5 |
| Hypertension Status | | | |
| HTN | 54 | 3 | 8 |
| No Diagnosis | 17 | 3 | 5 |
| BMI Category | | | |
| 18.5-14.9 | 1 | 0 | 0 |
| 25-29.9 | 4 | 0 | 1 |
| ≥30.0 | 66 | 6 | 12 |

Findings

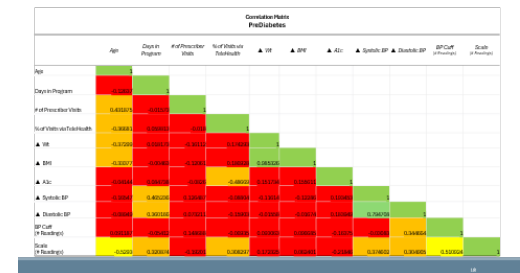
- More than half of the clients enrolled in the program experienced a reduction in their A1c
 - Over one third experiencing a clinically significant reduction.
- While over half of individuals experienced a decrease in BMI, most results were clinically insignificant.

Summary of Change in Health Outcomes

| | ▲ BMI | ▲ A1c | ▲ Systolic | ▲ Diastolic |
|---------|--------|---------|---------------|----------------|
| Mean | -0.835 | -0.5293 | -5.3258 | -2.6742 |
| Median | -0.75 | -0.2 | -4 | -3 |
| Mode | -2.5 | 0 | 0 | 0 |
| Range | 12.7 | 11.8 | 86 | 50 |
| Minimum | -6.8 | -6.5 | -54 | -26 |
| Maximum | 5.9 | 5.3 | 32 | 24 |
| Count | 90 | 90 | 90 | 90 |

Correlation Coefficient

| Size of Correlation | Interpretation |
|--------------------------------|---|
| .90 to 1.00 (-.90 to -1.00) | Very high positive (negative) correlation |
| .70 to .90 | High |
| .50 to .70 | Moderate |
| .30 to .50 | Low |
| .00 to .30 | Negligible |



Correlation Matrix PreDiabetes

| | Age | Days in Program | # of Prescriber Visits | % of Visits via TeleHealth | ▲ Wt | ▲ BMI | ▲ A1c | ▲ Systolic BP | ▲ Diastolic BP | BP Cuff (# Readings) | Scale (# Readings) |
|----------------------------|----------|-----------------|------------------------|----------------------------|----------|----------|----------|---------------|----------------|----------------------|--------------------|
| Age | 1 | | | | | | | | | | |
| Days in Program | -0.12637 | 1 | | | | | | | | | |
| # of Prescriber Visits | 0.431875 | -0.01573 | 1 | | | | | | | | |
| % of Visits via TeleHealth | -0.36681 | 0.059813 | -0.018 | 1 | | | | | | | |
| ▲ Wt | -0.37299 | 0.018173 | -0.16112 | 0.174293 | 1 | | | | | | |
| ▲ BMI | -0.33377 | -0.00463 | -0.12061 | 0.186928 | 0.985326 | 1 | | | | | |
| ▲ A1c | -0.04144 | 0.084738 | -0.0826 | -0.48669 | 0.151734 | 0.155611 | 1 | | | | |
| ▲ Systolic BP | -0.16547 | 0.465236 | 0.126487 | -0.08804 | -0.11614 | -0.12286 | 0.193453 | 1 | | | |
| ▲ Diastolic BP | -0.08949 | 0.360166 | 0.073211 | -0.15903 | -0.01558 | -0.01674 | 0.183949 | 0.794708 | 1 | | |
| BP Cuff (# Readings) | 0.091187 | -0.05412 | 0.148688 | -0.06935 | 0.093063 | 0.096685 | -0.16375 | -0.03083 | 0.344664 | 1 | |
| Scale (# Readings) | -0.5293 | 0.320874 | -0.19201 | 0.308297 | 0.172325 | 0.062401 | -0.21846 | 0.374602 | 0.304905 | 0.510924 | 1 |

Pre-Diabetes Findings

- No strong associations
- Age is positively correlated with the number of Provider Visits
- Age is negatively correlated with the proportion of telehealth visits.

| Summary of Change in Health Outcomes Prediabetes | | | | | | | | | |
|---|----------|---------|----------|---------|----------|---------------|----------|----------------|----------|
| ▲ Wt | | ▲ BMI | | ▲ A1c | | ▲ Systolic BP | | ▲ Diastolic BP | |
| Mean | -2.86923 | Mean | -0.53077 | Mean | -0.16923 | Mean | -3.69231 | Mean | -2.07692 |
| Median | 0.3 | Median | -0.05 | Median | -0.1 | Median | -5 | Median | -1.5 |
| Mode | 8.9 | Mode | #N/A | Mode | 0 | Mode | 8 | Mode | 0 |
| Range | 53.9 | Range | 8.1 | Range | 2.2 | Range | 49 | Range | 31 |
| Minimum | -36.6 | Minimum | -5.4 | Minimum | -1.4 | Minimum | -27 | Minimum | -20 |
| Maximum | 17.3 | Maximum | 2.7 | Maximum | 0.8 | Maximum | 22 | Maximum | 11 |
| Count | 26 | Count | 26 | Count | 26 | Count | 26 | Count | 26 |

Correlation Matrix
DM2: Starting A1c < 7.0%

| | Age | Days in Program | # of Prescriber Visits | % of Visits via TeleHealth | ▲ Wt | ▲ BMI | ▲ A1c | ▲ Systolic BP | ▲ Diastolic BP | Glucometer (Days Used) | Glucometer (# Readings) | BP Cuff (# Readings) | Scale (# Readings) |
|----------------------------|----------|-----------------|------------------------|----------------------------|----------|----------|----------|---------------|----------------|------------------------|-------------------------|----------------------|--------------------|
| Age | 1 | | | | | | | | | | | | |
| Days in Program | 0.254558 | 1 | | | | | | | | | | | |
| # of Prescriber Visits | 0.344653 | 0.34723 | 1 | | | | | | | | | | |
| % of Visits via TeleHealth | -0.19312 | 0.153351 | 0.3584837 | 1 | | | | | | | | | |
| ▲ Wt | 0.312163 | -0.3065 | 0.2699237 | -0.1607297 | 1 | | | | | | | | |
| ▲ BMI | 0.339882 | -0.31255 | 0.2340667 | -0.1367501 | 0.964707 | 1 | | | | | | | |
| ▲ A1c | -0.34285 | -0.23897 | -0.721296 | -0.3684748 | -0.15465 | -0.15312 | 1 | | | | | | |
| ▲ Systolic BP | 0.091364 | 0.345996 | 0.3764662 | -0.2652798 | 0.008231 | -0.07541 | 0.116854 | 1 | | | | | |
| ▲ Diastolic BP | 0.218968 | 0.15427 | 0.1511851 | 0.2420164 | -0.00233 | 0.145635 | 0.020739 | 0.256584 | 1 | | | | |
| Glucometer (Days Used) | 0.321914 | 0.445042 | 0.4582481 | -0.1920087 | -0.05488 | -0.06069 | -0.24817 | 0.241209 | -0.19665 | 1 | | | |
| Glucometer (# of Readings) | 0.316804 | 0.287302 | 0.5420217 | -0.1580396 | 0.083458 | 0.082136 | -0.28946 | 0.288835 | -0.06385 | 0.956171502 | 1 | | |
| BP Cuff (# Readings) | 0.276463 | 0.058119 | 0.1934606 | 0.2122024 | -0.05024 | -0.03123 | -0.38609 | -0.47473 | -0.10518 | 0.375862233 | 0.399629587 | 1 | |
| Scale (# Readings) | 0.014554 | -0.36965 | -0.479757 | -0.331289 | -0.057 | -0.07666 | 0.256946 | 0.005761 | 0.020825 | 0.03115577 | 0.05265597 | -0.29061 | 1 |

DM2: Starting A1c < 7.0% Findings

- The number of prescriber visits negatively correlated with A1c
- Prescriber visits positively correlated with increased use of remote monitoring glucometer
- Age is positively correlated with the number of Provider Visits

| Summary of Change in Health Outcomes DM2: Starting A1c < 7.0% | | | | | |
|--|----------|---------|----------|---------------|----------------|
| | ▲ Wt | ▲ BMI | ▲ A1c | ▲ Systolic BP | ▲ Diastolic BP |
| Mean | -6.25882 | Mean | -1.08824 | Mean | 0.894118 |
| Median | -4.2 | Median | -1.5 | Median | 0.4 |
| Mode | #N/A | Mode | -2.5 | Mode | -0.2 |
| Range | 56.9 | Range | 8.8 | Range | 5.5 |
| Minimum | -40 | Minimum | -5.6 | Minimum | -0.2 |
| Maximum | 16.9 | Maximum | 3.2 | Maximum | 5.3 |
| Count | 17 | Count | 17 | Count | 17 |

Correlation Matrix
DM2: Starting A1c 7.0% - 9.0%

| | Age | Days in Program | # of Prescriber Visits | % of Visits via TeleHealth | ▲ Wt | ▲ BMI | ▲ A1c | ▲ Systolic BP | ▲ Diastolic BP | Glucometer (Days of Used) | Glucometer (# Readings) | BP Cuff (# Readings) | Scale (# Readings) |
|-------------------------------|----------|-----------------|------------------------|----------------------------|----------|----------|----------|---------------|----------------|---------------------------|-------------------------|----------------------|--------------------|
| Age | 1 | | | | | | | | | | | | |
| Days in Program | 0.079468 | 1 | | | | | | | | | | | |
| # of Prescriber Visits | -0.20993 | 0.180845 | 1 | | | | | | | | | | |
| % of Visits via TeleHealth | 0.391421 | 0.158101 | -0.1574634 | 1 | | | | | | | | | |
| ▲ Wt | 0.504686 | 0.084234 | 0.0138134 | -0.0016779 | 1 | | | | | | | | |
| ▲ BMI | 0.508791 | 0.263088 | 0.0284691 | 0.3214028 | 0.871964 | 1 | | | | | | | |
| ▲ A1c | 0.051115 | 0.287006 | 0.0339795 | -0.1987026 | 0.233605 | 0.100372 | 1 | | | | | | |
| ▲ Systolic BP | -0.19332 | 0.253244 | -0.0616241 | 0.0643085 | 0.073702 | 0.18666 | 0.011467 | 1 | | | | | |
| ▲ Diastolic BP | -0.4715 | -0.02683 | 0.1813608 | -0.0710882 | -0.13156 | -0.02998 | 0.106983 | 0.517104 | 1 | | | | |
| Glucometer (Days of Readings) | 0.50552 | 0.330665 | 0.1001106 | 0.2362678 | 0.417166 | 0.565597 | -0.11251 | 0.311136 | 0.170573 | 1 | | | |
| Glucometer (# of Readings) | 0.423215 | 0.218251 | 0.0366135 | 0.0043983 | 0.505991 | 0.618393 | -0.29214 | 0.22087 | 0.077813 | 0.88298889 | 1 | | |
| BP Cuff (# Readings) | 0.390173 | 0.214159 | 0.3308267 | 0.1725823 | 0.101016 | 0.107642 | 0.013493 | 0.027287 | 0.024254 | 0.68328486 | 0.41111213 | 1 | |
| Scale (# Readings) | 0.496502 | 0.084662 | -0.114992 | -0.1302146 | 0.053448 | -0.0551 | 0.442651 | -0.0584 | -0.08885 | 0.28908012 | 0.23118504 | 0.13797 | 1 |

DM2: Starting A1c 7.0 - 9.0% Findings

- Age is positively correlated with changes in BMI and use of glucometer
- Use of glucometer positively correlated with changes in BMI
- Use of scale positively correlated with changes in A1c

| Summary of Change in Health Outcomes DM2: Starting A1c 7.0 - 9.0% | | | | | | | | | |
|--|--------|---------|--------|---------|--------|---------------|-------|----------------|-------|
| ▲ Wt | | ▲ BMI | | ▲ A1c | | ▲ Systolic BP | | ▲ Diastolic BP | |
| | | | | | | | | | |
| Mean | -7.925 | Mean | -1.135 | Mean | -0.265 | Mean | -7.45 | Mean | -3.45 |
| Median | -6.55 | Median | -0.85 | Median | -0.1 | Median | -4 | Median | -4 |
| Mode | #N/A | Mode | #N/A | Mode | 1.2 | Mode | -2 | Mode | 4 |
| Range | 122.2 | Range | 12.7 | Range | 4.4 | Range | 46 | Range | 32 |
| Minimum | -85.4 | Minimum | -6.8 | Minimum | -3.1 | Minimum | -32 | Minimum | -20 |
| Maximum | 36.8 | Maximum | 5.9 | Maximum | 1.3 | Maximum | 14 | Maximum | 12 |
| Count | 20 | Count | 20 | Count | 20 | Count | 20 | Count | 20 |

Correlation Matrix
DM2: Starting A1c > 9.0%

| | Age | Days in Program | # of Prescriber Visits | % of Visits via TeleHealth | ▲ Wt | ▲ BMI | ▲ A1c | ▲ Systolic BP | ▲ Diastolic BP | Glucometer (Days Used) | Glucometer (# of Readings) | BP Cuff (# Readings) | Scale (# Readings) |
|----------------------------|----------|-----------------|------------------------|----------------------------|----------|----------|----------|---------------|----------------|------------------------|----------------------------|----------------------|--------------------|
| Age | 1 | | | | | | | | | | | | |
| Days in Program | 0.149179 | 1 | | | | | | | | | | | |
| # of Prescriber Visits | -0.21341 | 0.538417 | 1 | | | | | | | | | | |
| % of Visits via TeleHealth | -0.21612 | 0.405576 | -0.099143 | 1 | | | | | | | | | |
| ▲ Wt | 0.133116 | -0.27475 | -0.144906 | 0.1498758 | 1 | | | | | | | | |
| ▲ BMI | 0.224312 | -0.28939 | -0.181202 | 0.0893968 | 0.902495 | 1 | | | | | | | |
| ▲ A1c | -0.24376 | 0.078701 | -0.251913 | 0.468966 | -0.01747 | 0.142868 | 1 | | | | | | |
| ▲ Systolic BP | -0.01096 | 0.040115 | -0.4639 | 0.4089546 | 0.038424 | 0.118219 | 0.423046 | 1 | | | | | |
| ▲ Diastolic BP | -0.11737 | -0.26783 | -0.326765 | 0.0460481 | 0.115739 | 0.203383 | 0.005479 | 0.448925 | 1 | | | | |
| Glucometer (Days Used) | 0.197446 | 0.580933 | 0.6905661 | -0.0616332 | -0.26685 | -0.39358 | -0.41053 | -0.36589 | -0.24452 | 1 | | | |
| Glucometer (# of Readings) | 0.159821 | 0.53466 | 0.6303664 | -0.0355342 | -0.34635 | -0.41268 | -0.18441 | -0.34449 | -0.20501 | 0.942971 | 1 | | |
| BP Cuff (# Readings) | -0.04841 | -0.10911 | -0.017245 | 0.0053227 | -0.3692 | -0.50842 | -0.10825 | 0.059766 | 0.060242 | 0.362516 | 0.39253 | 1 | |
| Scale (# Readings) | -0.24656 | -0.16148 | -0.350951 | 0.4631681 | -0.12394 | -0.12122 | 0.531011 | 0.42225 | 0.251526 | -0.11536 | -0.01711 | 0.818 | 1 |

DM2: Starting A1c > 9.0% Findings

- Age is positively correlated with changes in BMI and use of glucometer
- Use of scale positively correlated with changes in A1c
- Significant reduction in A1c

| Summary of Change in Health Outcomes DM2: Starting A1c > 9.0% | | | | | | | | | |
|--|----------|---------|----------|---------|----------|---------------|-----|----------------|----------|
| ▲ Wt | | ▲ BMI | | ▲ A1c | | ▲ Systolic BP | | ▲ Diastolic BP | |
| Mean | -2.20526 | Mean | -0.45526 | Mean | -2.88421 | Mean | 0 | Mean | -2.21053 |
| Median | 0 | Median | -0.3 | Median | -2.2 | Median | 0 | Median | -8 |
| Mode | 1 | Mode | -1.9 | Mode | -1.9 | Mode | -4 | Mode | -8 |
| Range | 38.8 | Range | 9.2 | Range | 5.8 | Range | 79 | Range | 44 |
| Minimum | -20.8 | Minimum | -6.4 | Minimum | -6.5 | Minimum | -47 | Minimum | -20 |
| Maximum | 18 | Maximum | 2.8 | Maximum | -0.7 | Maximum | 32 | Maximum | 24 |
| Count | 19 | Count | 19 | Count | 19 | Count | 19 | Count | 19 |

Symptom Scale Findings

Summary of Change (Symptom Scale Scores)

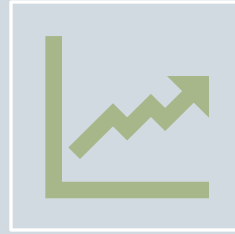
| ▲ <i>QIDS</i> | | ▲ <i>BDSS</i> | |
|---------------|-------|---------------|------|
| Mean | -1.30 | Mean | 0.75 |
| Median | -1 | Median | -4 |
| Mode | 0 | Mode | -9 |
| Range | 29 | Range | 38 |
| Minimum | -19 | Minimum | -9 |
| Maximum | 10 | Maximum | 29 |
| Count | 71 | Count | 12 |

QIDS = Quick Inventory of Depressive

Symptomatology Self-Report, BDSS = Brief Bipolar

Disorder Symptom Scale

Clinician Perspective



Bridging Gaps

Convenience
Enhanced Access
Efficiency



Trade Offs

Client Setting
Privacy Issues
Technological Issues
Impaired Therapeutic Alliance

- Carlos Alicea, MD (Psychiatrist)

Clinician Perspective

While telehealth has its role in healthcare, I have found, with the population we serve (those with SMI and chronic medical conditions) it's best to see them in person for primary care visits. There are vital pieces of a clinic visit that can't be replicated via telehealth, the physical health exam chief among them. Are there times when telehealth can be beneficial? Yes, as we saw during the pandemic – virtual visits allowed us to continue treating our patients safely, and even now, when someone is unable to come in it can be helpful.

Remote monitoring devices, particularly the glucometers, allowed for additional information that was helpful in making treatment decisions. Patients often forget to bring in their logs, have difficulty recalling results, or just don't check at home. To be able to refer to a dashboard that showed at home results allowed me to provide more immediate adjustments in care and more effectively treat patients.

Some clients experienced significant improvements in physical health outcomes while receiving project services, and I strongly suspect those that didn't were among those that had difficulties in obtaining medication-it would certainly be a contributing factor. Overall, as is the case with clinicians, there is mixed satisfaction with telehealth among my patients. As indicated by the data, there are also mixed results – telehealth is not a one size fits all tool.

-Jose Ledezma, MD (Primary Care)

Discussion

Total Results

Distribution of remote monitoring devices and high frequency use of telehealth services led to little change in physical health indicators

Aggregated

When stratified by diagnosis and starting A1c we find patterns that assist in shaping program structure and allocation of resources.

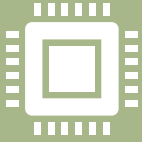
Program improved access and engagement in care.

Takeaways

↑ starting A1c : ↑ frequency of visits ≈ ↑ use of monitoring devices and greater ↓ in A1c and BMI.

↓ Age: ↑ proportion of Telehealth Provider Visits

Telehealth useful tool for retention



Provision of additional follow-up training and support regarding utilization of remote monitoring devices.



While frequent virtual touchpoints with nursing and clinic staff will continue, most psychiatric and primary care visits will take place face-to-face within the clinic, with telehealth services reserved for extenuating circumstances.



Following an additional six months of in-person clinic services, health outcomes (i.e., A1c, BMI, BP, symptom scale scores) will be collected and aggregated. These outcomes will be evaluated against initial and post-telehealth period findings; results will inform future program service structures and modalities.

Next Steps

Key Takeaways

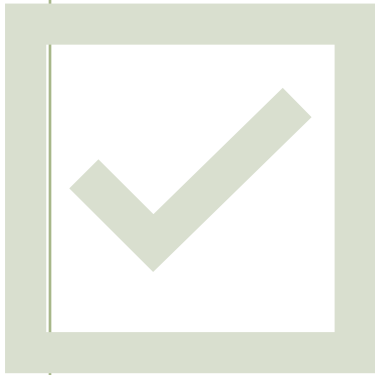
Is Telehealth helpful for individuals with comorbid SMI and Diabetes?

- Key to provision of clinical services in pandemic and beyond.
- Facilitates access and continuity of care (i.e., individuals were more likely to keep appointments).
- Greatest impact to physical health indicators were among those with uncontrolled A1c's.
- Regardless of starting A1c, clients' health status remained relatively stable.

What role did remote monitoring devices play in the provision of care?

- One-to-one training and support prior to distribution was crucial to client buy-in and participation.
- Improved overall engagement in treatment.
- Real time monitoring of blood glucose readings enabled rapid adjustments to insulin when needed.

Lessons Learned



- Remote monitoring devices to measure blood pressure and weight were ineffective in monitoring health status due to use (and subsequent upload of results) by others in the household.
- Uniform definition and documentation of No-Show visits imperative.
- Many individuals served struggled to make space for telehealth visit (e.g., lack of private space, background noise, multiple people in the household, connectivity issues).
- Complex interplay of SMI, chronic medical comorbidities, and various psychosocial issues makes face-to-face service provision preferable for individuals whose symptoms and chronic conditions are not yet well controlled.



Questions?

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