Quarterly Progress Update

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North Carolina Statewide Telepsychiatry Program (NC-STeP)
Professor and Chair Emeritus
Department of Psychiatry and Behavioral Medicine
Brody School of Medicine - East Carolina University
39 hospitals in the network, 38 hospitals were live
• 29 hospitals reporting Telepsychiatry patients in their ED
  – not all live hospitals had telepsychiatry patients
• Total number of assessments for this quarter = 1,470
• Patient assessments billed for Model 1 hospitals = 1,032
• Total number of encounters for this quarter = 1,208
• Patient encounters for Model 1 hospitals = 770
NC-STeP Quality Management and Outcomes Monitoring Processes: January – March 2022

- The Median Length of Stay was 42.7 hours
- The Average Length of Stay was 74.5 hours
  - 73.9 hours for those discharged to home
  - 72.9 hours for those transferred to another facility
- Average Consult Elapsed Time (in Queue to Exam Complete) for Model 1 hospitals was 5 hours and 32 minutes.
• 806 ED patients who received telepsychiatry services had an IVC in place during their ED stay.
  – 367 (45.5%) of those patients did not have an IVC in place when discharged.

• Of the ED patients who received telepsychiatry services:
  – 50.0% were discharged to home
  – 42.5% were discharged to another facility
• 21 Community based sites were live as of 03/31/2022.
• There were 1,139 total behavioral health visits.
  – 103 visits with a Psychiatrist.
  – 1,036 visits with a behavioral health manager.
  – 21 visits with a Maternal and Fetal Medicine Specialist.
Since project inception in November 2013

<table>
<thead>
<tr>
<th></th>
<th>Since project inception in November 2013</th>
<th>Quarter Jul- Sep 2021</th>
<th>Quarter Oct- Dec 2021</th>
<th>Quarter Jan- Mar 2022</th>
<th>Quarter Apr- Jun 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Patient Encounters</td>
<td>40,295</td>
<td>1,179</td>
<td>1,218</td>
<td>1,208</td>
<td></td>
</tr>
<tr>
<td>Model 1 Hospital Patient Encounters</td>
<td>24,493</td>
<td>705</td>
<td>752</td>
<td>770</td>
<td></td>
</tr>
<tr>
<td>Model 2 Hospital Patient Encounters</td>
<td>15,802</td>
<td>474</td>
<td>466</td>
<td>438</td>
<td></td>
</tr>
<tr>
<td>Total Number of Assessments</td>
<td>52,764</td>
<td>1,403</td>
<td>1,477</td>
<td>1,470</td>
<td></td>
</tr>
</tbody>
</table>

(Billed Assessments for Model 1 Hospitals + Number of Patient Encounters for Model 2 Hospitals)
Since project inception in November 2013

| Model 1 Hospital Patient Encounters | 24,493 | 4,578 | 5,849 | 706 | 2,044 | 2,654 | 1,902 | 2,152 | 2,896 |
| Model 2 Hospital Patient Encounters | 15,802 | 566 | 1,279 | 1,190 | 1,927 | 3,450 | 2,933 | 2,153 | 1,866 |
| Total Number of Assessments (Billed Assessments for Model 1 Hospitals + Number of Patient Encounters for Model 2 Hospitals) | 52,764 | 8,130 | 13,573 | 1,942 | 4,348 | 6,680 | 5,287 | 4,820 | 5,640 |
### NC-STeP Benchmarks

<table>
<thead>
<tr>
<th>Goals</th>
<th>Values Reached</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative Target to be reached by (06/30/2022)</td>
<td>Value Reached as of most recent previous quarter (12/31/2021)</td>
</tr>
<tr>
<td>Number of IVCs</td>
<td>2,557</td>
</tr>
<tr>
<td>Number of IVCs Overturned</td>
<td>1,023</td>
</tr>
<tr>
<td>Total Number of Assessments (Billed assessments for Model 1 hospitals + Number of patient encounters for Model 2 hospitals.)</td>
<td>4,261</td>
</tr>
</tbody>
</table>
## NC-STeP Status as of March 31, 2022

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>BASELINE VALUES/MEASURES AS REPORTED ON 03/31/2021</th>
<th>TARGET TO BE REACHED BY 06/30/2022</th>
<th>VALUES/MEASURES REACHED AS OF 03/31/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The number of full-time equivalent (FTE) positions supported by these contracts</td>
<td>4.10 FTEs</td>
<td>4.30 FTEs</td>
<td>4.08 FTEs</td>
</tr>
<tr>
<td>2. The number of overturned involuntary commitments (inpatient admission prevented)</td>
<td>711</td>
<td>1,023</td>
<td>367 in this quarter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cumulative total since program inception 8,392</td>
</tr>
<tr>
<td>3. The number of participating consultant providers</td>
<td>40</td>
<td>48</td>
<td>52</td>
</tr>
</tbody>
</table>
### NC-STeP Status as of March 31, 2022

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>BASELINE VALUES/MEASURES AS REPORTED ON 03/31/2021</th>
<th>TARGET TO BE REACHED BY 06/30/2022</th>
<th>VALUES/MEASURES REACHED AS OF 03/31/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. The number of telepsychiatry assessments conducted.</td>
<td>4,251</td>
<td>4,261</td>
<td>1,470 in this quarter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cumulative total since program inception 52,764</td>
</tr>
<tr>
<td>5. The number of telepsychiatry referring sites</td>
<td>48</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>38 Live</td>
</tr>
<tr>
<td>6. The reports of involuntary commitments to enrolled hospitals</td>
<td>2,061</td>
<td>2,557</td>
<td>806 in this quarter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cumulative total since program inception 23,801</td>
</tr>
</tbody>
</table>
## NC-STeP Status as of March 31, 2022

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>BASELINE VALUES/MEASURES AS REPORTED ON 03/31/2021</th>
<th>TARGET TO BE REACHED BY 06/30/2022</th>
<th>VALUES/MEASURES REACHED AS OF 03/31/2022</th>
</tr>
</thead>
</table>
| 7. The average (mean) Length of Stay for all patients with a primary mental health diagnosis across all dispositions. | 55 hours                                             | 55 hours                          | QTD Average = 74.5  
QTD Median = 42.7  |
| 8. The rate of "satisfied" or "strongly satisfied" among emergency department staff participating in NC-STeP. | 88%                                                 | 80%                               | 64%                                      |
### NC-STeP Status as of March 31, 2022

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>BASELINE VALUES/MEASURES AS REPORTED ON 03/31/2021</th>
<th>TARGET TO BE REACHED BY 06/30/2022</th>
<th>VALUES/MEASURES REACHED AS OF 03/31/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. The rate of &quot;satisfied&quot; or &quot;strongly satisfied&quot; among hospital CEOs/COOs participating in NC-STeP.</td>
<td>100%</td>
<td>100%</td>
<td>83%</td>
</tr>
<tr>
<td>10. The rate of &quot;satisfied&quot; or &quot;strongly satisfied&quot; among consulting (hub) providers participating in NC-STeP.</td>
<td>100%</td>
<td>85%</td>
<td>100%</td>
</tr>
</tbody>
</table>
### NC-STeP Status as of March 31, 2022

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>BASELINE VALUES/MEASURES AS REPORTED ON 03/31/2021</th>
<th>TARGET TO BE REACHED BY 06/30/2022</th>
<th>VALUES/MEASURES REACHED AS OF 03/31/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. The rate of &quot;satisfied&quot; or &quot;strongly satisfied&quot; among emergency department physicians participating in the statewide telepsychiatry program.</td>
<td>100%</td>
<td>85%</td>
<td>100%</td>
</tr>
<tr>
<td>12. Cumulative return on investment to state psychiatric facilities through overturned involuntary commitments (inpatient admission prevented)</td>
<td>$3,890,000</td>
<td>$5,522,256</td>
<td>$1,981,800</td>
</tr>
</tbody>
</table>

Cumulative average since program inception $45,316,800
Number of NC-STeP Patients by Hospital
January - March 2022

- Albemarle: 117
- Beaufort: 52
- Bertie: 42
- Chowan: 52
- Duplin: 52
- Edgecombe: 63
- Outer Banks: 168
- Lenoir: 9
- McDowell Cashiers: 9
- Blue Ridge Transylvania: 51
- St. Lukes: 17
- Angel Chatham: 17
- Maria Parham Franklin: 48
- Erlanger: 80
- *Bladen: 89
- Dosher: 8
- Northern of Surry: 8
- Lake Norman: 8
- Halifax: 140
- UNC Rockingham AdventHealth: 11
-cashiers
- Angel Chatham
- Maria Parham Franklin
- Erlanger
- *Bladen
- Dosher
- Northern of Surry
- Lake Norman
- Halifax
- UNC Rockingham AdventHealth
Percent of Use by Hospital
Jan-Mar 2022
(based on number of encounters)
Percent of Use for Model 1 Hospital
Jan-Mar 2022
(based on number of encounters)

- Albemarle: 15%
- Betsy Johnson: 18%
- Central Harnett: 2%
- Duplin: 6%
- Erlanger: 12%
- Halifax: 3%
- Hugh Chatham: 6%
- Iredell: 6%
- Lake Norman: 2%
- Lenoir: 8%
- Outer Banks: 7%
- St. Lukes: 2%
- UNC Rockingham: 6%
- All Others Combined: 7%

East Carolina University
CENTER FOR TELEPSYCHIATRY
NC-SteP
Number of Patients by Provider (Model 1)

Jan-Mar 2022

Oct-Dec 2021
Number of Patients by Model

Jan-Mar 2022

- Model 1: 770 patients
- Model 2: 438 patients

Oct-Dec 2021

- Model 1: 727 patients
- Model 2: 466 patients
38% percent of patients had a LOS of 30 hours or less

Number of NC-STeP Patients by LOS Category
Jan - Mar 2022
in hours

Median Length of Stay for Jan-Mar 2022 = 42.7 hours

32 patients had a LOS longer than 300 hours
51% percent of patients had a LOS of 30 hours or less

Number of NC-STeP Patients by LOS Category
Jan - Dec 2021
in hours

Number of patients with a LOS in this category

Median Length of Stay for Jan-Dec 2021 = 29.2 Hours

115 patients had a LOS longer than 300 hours over the 12 months
Median Length of Stay by Quarter
(in hours)

Year 1:
- Jan-Mar 2019: 25.3
- Apr-Jun 2019: 25.5
- Jul-Sep 2019: 27.2
- Oct-Dec 2019: 25.4
- Jan-Mar 2020: 25.6
- Apr-Jun 2020: 24.2
- Jul-Sep 2020: 27.3
- Oct-Dec 2020: 25.3
- Jan-Mar 2021: 27.5
- Apr-Jun 2021: 28.5
- Jul-Sep 2021: 30.4
- Oct-Dec 2021: 31.6
- Jan-Mar 2022: 42.7

Year 2:
- Jan-Mar 2019: 25.3
- Apr-Jun 2019: 25.5
- Jul-Sep 2019: 27.2
- Oct-Dec 2019: 25.4
- Jan-Mar 2020: 25.6
- Apr-Jun 2020: 24.2
- Jul-Sep 2020: 27.3
- Oct-Dec 2020: 25.3
- Jan-Mar 2021: 27.5
- Apr-Jun 2021: 28.5
- Jul-Sep 2021: 30.4
- Oct-Dec 2021: 31.6
- Jan-Mar 2022: 42.7

Year 3:
- Jan-Mar 2019: 25.3
- Apr-Jun 2019: 25.5
- Jul-Sep 2019: 27.2
- Oct-Dec 2019: 25.4
- Jan-Mar 2020: 25.6
- Apr-Jun 2020: 24.2
- Jul-Sep 2020: 27.3
- Oct-Dec 2020: 25.3
- Jan-Mar 2021: 27.5
- Apr-Jun 2021: 28.5
- Jul-Sep 2021: 30.4
- Oct-Dec 2021: 31.6
- Jan-Mar 2022: 42.7
Average Length of Stay by Quarter (in hours)

- Apr-Jun 2019: 47.7
- Jul-Sep 2019: 46.7
- Oct-Dec 2019: 42.7
- Jan-Mar 2020: 49.3
- Apr-Jun 2020: 53.9
- Jul-Sep 2020: 50.5
- Oct-Dec 2020: 63.4
- Jan-Mar 2021*: 57
- Apr-Jun 2021*: 72.5
- Jul-Sep 2021*: 72.6
- Oct-Dec 2021*: 74.5
- Jan-Mar 2022: 74.5
Average Length of Stay by Hospital
January - March 2022
(in hours)
Average LOS by Provider (in hours)

Jan-Mar 2022

Oct-Dec 2021

CBC  | ECU
---   | ---
|
93.5 | 97.5
|
|
77.6 | 70.6
Jan-Mar 2022 (in hours)

- Mission (412):
  - Cape Fear (26 patients):
    - CBC (537 patients):
      - ECU (233 patients):

Oct-Dec 2021 (in hours)

- Mission (410):
  - Cape Fear (50 patients):
  - CBC (513 patients):
  - ECU (214 patients):
    - UNC (6 patients):

Average Length of Stay by Provider
Average LOS by Model

Jan-Mar 2022 (in hours)

Model 1: 94.7 hours
Model 2: 39.1 hours

Oct-Dec 2021 (in hours)

Model 1: 75.6 hours
Model 2: 34.7 hours
Average Length of Stay by Quarter for Patients Discharged to Home or Transfer
(in hours)

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Avg LOS for patients discharged HOME</th>
<th>Avg LOS for patients discharged TRANSFER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr-Jun 2019</td>
<td>46.2</td>
<td>65.6</td>
</tr>
<tr>
<td>Jul-Sep 2019</td>
<td>45.3</td>
<td>50.3</td>
</tr>
<tr>
<td>Oct-Dec 2019</td>
<td>40.9</td>
<td>48.8</td>
</tr>
<tr>
<td>Jan-Mar 2020</td>
<td>53.2</td>
<td>61.5</td>
</tr>
<tr>
<td>Apr-Jun 2020</td>
<td>47.4</td>
<td>51.6</td>
</tr>
<tr>
<td>Jul-Sep 2020</td>
<td>56.8</td>
<td>62.4</td>
</tr>
<tr>
<td>Oct-Dec 2020</td>
<td>47.8</td>
<td>56.1</td>
</tr>
<tr>
<td>Jan-Mar 2021*</td>
<td>61.5</td>
<td>69.9</td>
</tr>
<tr>
<td>Apr-Jun 2021*</td>
<td>58.4</td>
<td>50.7</td>
</tr>
<tr>
<td>Jul-Sep 2021*</td>
<td>50.7</td>
<td>64.2</td>
</tr>
<tr>
<td>Oct-Dec 2021*</td>
<td>70.5</td>
<td>78.8</td>
</tr>
<tr>
<td>Jan-Mar 2022</td>
<td>73.9</td>
<td>72.9</td>
</tr>
</tbody>
</table>

[Graph showing average length of stay by quarter for patients discharged home or transfer]
**Average LOS by Discharge Disposition**

**Jan-Mar 2022** (in hours)

```
- AVG - ALL DISPOSITIONS: 74.5 hours
- Other: 85.8 hours
- Admit: 120.8 hours
- Transfer: 72.9 hours
- Home: 73.9 hours
```

**Oct-Dec 2021** (in hours)

```
- AVG - ALL DISPOSITIONS: 59.7 hours
- Other: 89.2 hours
- Admit: 120.5 hours
- Transfer: 62.4 hours
- Home: 52.5 hours
```
26% of encounters are 30 hrs or less

<table>
<thead>
<tr>
<th>Encounter length</th>
<th>Number of Encounters</th>
<th>Percent of All Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 hours or less</td>
<td>200</td>
<td>26%</td>
</tr>
<tr>
<td>50 hours or less (about 2 days)</td>
<td>352</td>
<td>46%</td>
</tr>
<tr>
<td>100 hours or less (about 4 days)</td>
<td>552</td>
<td>72%</td>
</tr>
<tr>
<td>150 hours or less (about 6 days)</td>
<td>652</td>
<td>83%</td>
</tr>
<tr>
<td>200 hours or less (about 8 days)</td>
<td>694</td>
<td>90%</td>
</tr>
</tbody>
</table>

**Average LOS**: 94.7

**Median LOS**: 57.5

<table>
<thead>
<tr>
<th>Very Long Encounters</th>
<th>Number of Encounters</th>
<th>Percent of All Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 hours or more (about 8 days)</td>
<td>76</td>
<td>9.90%</td>
</tr>
<tr>
<td>300 hours or more (about 12 days)</td>
<td>32</td>
<td>4%</td>
</tr>
<tr>
<td>400 hours or more (about 16 days)</td>
<td>21</td>
<td>3%</td>
</tr>
</tbody>
</table>
39% of encounters are 30 hrs or less

<table>
<thead>
<tr>
<th>Encounter Length</th>
<th>Number of Encounters</th>
<th>Percent of All Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 hours or less</td>
<td>1129</td>
<td>39%</td>
</tr>
<tr>
<td>50 hours or less (about 2 days)</td>
<td>1678</td>
<td>58%</td>
</tr>
<tr>
<td>100 hours or less (about 4 days)</td>
<td>2331</td>
<td>80%</td>
</tr>
<tr>
<td>150 hours or less (about 6 days)</td>
<td>2552</td>
<td>88%</td>
</tr>
<tr>
<td>200 hours or less (about 8 days)</td>
<td>2678</td>
<td>93%</td>
</tr>
<tr>
<td>Over 300 hours</td>
<td>136</td>
<td>4.60%</td>
</tr>
<tr>
<td>total number of encounters</td>
<td>2896</td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>Num of Encounters</td>
<td>Percent of Total Encounters</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>BETSY JOHNSON</td>
<td>140</td>
<td>18.18</td>
</tr>
<tr>
<td>ALBEMARLE</td>
<td>117</td>
<td>15.19</td>
</tr>
<tr>
<td>ERLANGER</td>
<td>89</td>
<td>11.56</td>
</tr>
<tr>
<td>LENOIR</td>
<td>63</td>
<td>8.18</td>
</tr>
<tr>
<td>OUTER BANKS</td>
<td>52</td>
<td>6.75</td>
</tr>
<tr>
<td>ROCKINGHAM</td>
<td>49</td>
<td>6.36</td>
</tr>
<tr>
<td>HUGH CHATHAM</td>
<td>48</td>
<td>6.23</td>
</tr>
<tr>
<td>IREDELL</td>
<td>43</td>
<td>5.58</td>
</tr>
<tr>
<td>DUPLIN</td>
<td>42</td>
<td>5.45</td>
</tr>
<tr>
<td>VIDANT NORTH HALIFAX</td>
<td>19</td>
<td>2.47</td>
</tr>
<tr>
<td>LAKE NORMAN</td>
<td>17</td>
<td>2.21</td>
</tr>
<tr>
<td>ST LUKES</td>
<td>17</td>
<td>2.21</td>
</tr>
<tr>
<td>HARNETT</td>
<td>16</td>
<td>2.08</td>
</tr>
<tr>
<td>BEAUFORT</td>
<td>13</td>
<td>1.69</td>
</tr>
<tr>
<td>ADVENTHEALTH</td>
<td>11</td>
<td>1.43</td>
</tr>
<tr>
<td>DOSHER</td>
<td>8</td>
<td>1.04</td>
</tr>
<tr>
<td>NORTHERN OF SURRY</td>
<td>8</td>
<td>1.04</td>
</tr>
<tr>
<td>EDGECOMBE</td>
<td>5</td>
<td>0.65</td>
</tr>
<tr>
<td>CHOWAN</td>
<td>4</td>
<td>0.52</td>
</tr>
<tr>
<td>PENDER</td>
<td>3</td>
<td>0.39</td>
</tr>
<tr>
<td>BERTIE</td>
<td>3</td>
<td>0.39</td>
</tr>
<tr>
<td>MARIA PARHAM</td>
<td>2</td>
<td>0.26</td>
</tr>
<tr>
<td>MARIA PARHAM FRANKLIN</td>
<td>1</td>
<td>0.13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>770</strong></td>
<td><strong>94.7</strong></td>
</tr>
</tbody>
</table>
Consult Elapsed Time: January – March 2022

CBC & ECU
Average Consult Exam Elapsed Time
In Queue to Exam Complete
FY22-Q3 January – March 2022
(5 hrs. 32 min.)

Comparison CBC & ECU
Average Consult Elapsed Time
In Queue to Exam Complete
FY22-Q3 January - March 2022

<table>
<thead>
<tr>
<th>In Queue Wait Time</th>
<th>Exam Elapsed Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:47:37</td>
<td>1:44:49</td>
</tr>
</tbody>
</table>

Comparison of In Queue Wait Time and Exam Elapsed Time between CBC and ECU.
Percent of Patients by Discharge Disposition

Jan-Mar 2022
- Home: 50%
- Transfer: 43%
- Other: 1%
- Admit: 6%

Oct-Dec 2021
- Home: 49%
- Transfer: 45%
- Other: 4%
- Admit: 2%
Investigating the Impact of Covid-19 on Telepsychiatry Use Across Sex and Race: A Study of North Carolina Emergency Departments

Yajiong Xue, PhD¹, Sy A. Saeed, MD², Huigang Liang, PhD³, Kathrine Jones, PhD⁴, and Kalyan S. Muppavarapu, MD²

Abstract

Introduction: The COVID-19 pandemic and the intervention measures have increased mental health problems among Americans. Telepsychiatry provides a safe and efficient way to serve mental health patients in emergency departments (EDs). The objective of this study is to evaluate the impact of COVID-19 on telepsychiatry consultations in North Carolina (NC) and analyze the differences across sex and race.

Methods: This longitudinal observational study used data from the NC Statewide Telepsychiatry Program to examine temporal changes in ED telepsychiatry consultations from January 2019 to March 2021 (117 weeks), including 4,739 telepsychiatry consultations conducted by 27 hospitals in 24 counties in NC during the period. The outcome measures were telepsychiatry consultation counts. Weekly ED telepsychiatry consultation counts were calculated overall and stratified by sex and race.

Results: The overall weekly ED telepsychiatry consultation counts were decreasing before the national lockdown but started increase after the lockdown. Moreover, the counts of telepsychiatry consultations for white patients had a stronger increasing trend than that for black patients. Comparing telepsychiatry counts during the lockdown period (March and April) in 2020 and the same period in 2019, male patients had higher counts while female patients had lower counts, and white patients had higher counts while black patients had lower counts.

Discussion: It seems that the COVID-19 crisis has led to a heightening demand for telepsychiatry consultations in NC, and there is a possible race disparity in these demands between black and white mental health patients. These findings underscore the need to further develop telepsychiatry services and enhance access to black patients.
The Impact of NC Statewide Telepsychiatry Program (NC-STEp) on Cost Savings by Reducing Unnecessary Psychiatric Hospitalizations During a 6½ Year Period

Sy Atezaz Saeed, Katherine Jones, Kalyan Muppavarapu

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Abstract

Objective To study the impact of the North Carolina Statewide Telepsychiatry Program in reducing unnecessary psychiatric hospitalizations and cost savings during a 6½ year period.

Methods Patient encounter data was extracted from the NC-STEp database that captured records of 19,383 patients who received services over a 6½ years’ period. We analyzed the data to calculate the total number of patient encounters, the number of encounters with an IVC, and the number of encounters with an IVC that was overturned. For encounters with an overturned IVC, we also determined the patient discharge disposition. We estimated the cost of a typical mental health hospitalization to measure the savings generated by the overturned IVCs in the NC-STEp program.

Results Over the 6½ year period there were 19,383 NC-STEp patient encounters at partner hospital emergency departments. There were 13,537 encounters where the patient had an IVC in place during the ED stay, and 4,627 where the IVC was overturned (34%). For patients where there was an IVC that was overturned, 85.9% of those patients were ultimately discharged home. Using the “three-way bed” cost estimate of $4,500 for each overturned IVC, the cost savings generated by the NC-STEp program from November 2013 to June 2020 were $20,821,500.

Conclusions Telepsychiatry consultation services in the emergency departments can decrease unnecessary psychiatric hospitalizations and contribute to significant cost savings to the healthcare system and society and improve the outcomes for patients and families by decreasing financial burden and stress associated with a hospital stay.
Jan-Mar 2022

Model 1 (54.5% Turnover)

Model 2 (7.2% Turnover)

Oct-Dec 2021

Model 1 (52.3% Turnover)

Model 2 (3.1% Turnover)

Number of IVCs and IVC Turnovers by Model
Jan-Mar 2022

Number of IVCs and IVC Turnovers by Provider

Oct-Dec 2021
Satisfaction Surveys

- Satisfaction surveys are done twice a year.
- Most recent surveys were conducted in March 2022.
- Invitations to participate were sent via electronic mail.
- For groups that use the portal (Model 1 ED staff, psychiatrists, and intake specialists) there was a link to the survey on the portal log-in page.
- Surveys were completed online via Qualtrics software.
  - 41 individuals responded to the survey (N = 41).
  - The overall satisfaction rate is 76%.
Satisfaction surveys were conducted in March 2022 with 9 groups

1. Model 1 Emergency Department Physicians
2. Model 1 Emergency Department Staff
3. Model 1 Provider Psychiatrists
4. Model 1 Psychiatric Intake Specialists
5. Model 1 Hospital CEOs
6. Model 2 Emergency Department Physicians
7. Model 2 Emergency Department Staff
8. Model 2 Provider Psychiatrists
9. Model 2 Hospital CEOs

Each group was given a different survey (with different questions) based on their role in the program.
• 41 individuals responded to the survey (N = 41).
• For each group, one summary question is selected for an overall “satisfaction” rate.
• The overall satisfaction rate is 76%.
Model 1 ED Staff: Telepsychiatry consults have enhanced behavioral health patient care in our ED
**this question used to measure overall satisfaction**
Model 1 Hospital ED Staff Results (n=25)

Model 1 ED Staff: The telepsychiatry equipment is easy to use
- Agree: 96%
- Disagree: 4%
- Undecided: 0%

Model 1 ED Staff: I received adequate training/instruction preparing me to use the telepsychiatry cart
- Agree: 84%
- Disagree: 8%
- Undecided: 8%

Model 1 ED Staff: The telepsychiatry equipment is reliable and seldom goes down.
- Agree: 72%
- Disagree: 20%
- Undecided: 8%

Model 1 ED Staff: Patients appear comfortable using the telepsychiatry equipment to talk with the provider
- Agree: 76%
- Disagree: 8%
- Undecided: 16%
Model 1 Hospital ED Staff Results (n=25)

Model 1 ED Staff: The NC-STeP portal is easy to use.

- Disagree: 8%
- Undecided: 8%
- Agree: 84%

Model 1 ED Staff: The training and resources provided adequately prepared me to use the NC-STeP portal.

- Disagree: 0%
- Undecided: 16%
- Agree: 84%

Model 1 ED Staff: The NC-STeP portal is reliable and unscheduled downtime is rare.

- Disagree: 8%
- Undecided: 16%
- Agree: 76%

Model 1 ED Staff: The level of technical expertise provided by NC-STeP support is adequate.

- Disagree: 16%
- Undecided: 12%
- Agree: 72%
Model 1 Psychiatrist: I am satisfied with providing psychiatric consults via telepsychiatry

**this question used to measure overall satisfaction

- Disagree: 0%
- Undecided: 0%
- Agree: 100%

East Carolina University
CENTER FOR TELEPSYCHIATRY
NC-STeP
Model 1 Provider Psychiatrist Results (n=6)

Model 1 Psychiatrist: Telepsychiatry is an effective and efficient way of assessing and treating behavioral health patients
- Agree: 83%
- Undecided: 17%
- Disagree: 0%

Model 1 Psychiatrist: I believe the quality of psychiatric care I provide via telepsychiatry is comparable to the quality of care I deliver face to face
- Agree: 67%
- Undecided: 17%
- Disagree: 17%

Model 1 Psychiatrist: Telepsychiatry increases my productivity and/or efficiency
- Agree: 83%
- Undecided: 0%
- Disagree: 17%

Model 1 Psychiatrist: The telepsychiatry desktop unit is straightforward to use
- Agree: 100%
- Undecided: 0%
- Disagree: 0%
Model 1 Provider Psychiatrist Results (n=6)

- Model 1 Psychiatrist: The telepsychiatry desktop unit is reliable and seldom down
  - Agree: 100%

- Model 1 Psychiatrist: The NC-STeP portal is straightforward to use.
  - Agree: 83%
  - Undecided: 0%

- Model 1 Psychiatrist: I received adequate training and resources preparing me to use the NC-STeP portal
  - Agree: 100%

- Model 1 Psychiatrist: The NC-STeP portal works well without excessive delays or downtime
  - Agree: 83%
Intake Specialist: I am satisfied with providing psychiatric consults via telepsychiatry

**this question used to measure overall satisfaction**

- Disagree: 0%
- Undecided: 0%
- Agree: 100%
Model 1 Psychiatric Intake Specialist Results (n=3)

Intake Specialist: Telepsychiatry is an effective and efficient way of assessing and treating behavioral health patients

- Disagree: 0%
- Undecided: 0%
- Agree: 100%

Intake Specialist: I believe the quality of psychiatric care I provide via telepsychiatry is comparable to the quality of care I deliver face to face

- Disagree: 0%
- Undecided: 33%
- Agree: 67%

Intake Specialist: Telepsychiatry increases my productivity and/or efficiency.

- Disagree: 33%
- Undecided: 0%
- Agree: 67%

Intake Specialist: The telepsychiatry desktop unit is straightforward to use

- Disagree: 33%
- Undecided: 0%
- Agree: 67%
Model 1 Psychiatric Intake Specialist Results (n=3)

Intake Specialist: The telepsychiatry desktop unit is reliable and seldom down

- Disagree: 33%
- Undecided: 0%
- Agree: 67%

Intake Specialist: The NC-STEp portal is straightforward to use

- Disagree: 33%
- Undecided: 0%
- Agree: 67%

Intake Specialist: I received adequate training and resources preparing me to use the portal

- Disagree: 33%
- Undecided: 0%
- Agree: 67%

Intake Specialist: The NC-STEp portal works well without excessive delays or downtime

- Disagree: 0%
- Undecided: 0%
- Agree: 100%
Model 1 Hospital CEO: The overall quality of care for psychiatric patients utilizing our ED has improved

**this question used to measure overall satisfaction

- Disagree: 0%
- Undecided: 17%
- Agree: 83%
Model 1 CEO/CNO/CFO Results (n=6)

Model 1 Hospital CEO: The LOS for psychiatric patients in our ED has reduced

- Agree: 83%
- Disagree: 17%
- Undecided: 0%

Model 1 Hospital CEO: Overall, ED throughput has improved.

- Agree: 100%
- Disagree: 0%
- Undecided: 0%

Model 1 Hospital CEO: Overall, ED staff satisfaction has improved

- Agree: 100%
- Disagree: 0%
- Undecided: 0%

Model 1 Hospital CEO: There has been an improvement in discharge planning and referrals for psychiatric patients in our ED

- Agree: 67%
- Disagree: 33%
- Undecided: 0%
Model 1 CEO/CNO/CFO Results (n=6)

Model 1 Hospital CEO: Medical staff’s understanding of mental health issues and treatment options in our ED has improved

Model 1 Hospital CEO: Our hospital’s use of NC-STeP consultants has been cost effective

Model 1 Hospital CEO: I would recommend NC-STeP to other hospitals

Model 1 Hospital CEO: I would pursue additional uses of telemedicine technology for other medical specialty areas
NC-STeP Charge Mix
QTD FY2022 - Quarter 3

- Self-Pay, 24%
- Blue Shield, 12%
- Medicare, 13%
- LME/MCO's, 27%
- Medicaid, 8%
- LME/PRS, 4%
- Commercial, 7%
- Other, 5%
- Medicaid, 8%
NC-STeP Charge Mix - Project to Date

Service Dates: October 1, 2013 – March 31, 2022

- Self-Pay: 33%
- Other: 5%
- Medicare: 17%
- LME/MCO's: 25%
- Medicaid: 4%
- LME/IPRS: 3%
- Commercial: 6%
- Blue Shield: 7%
### NC-STeP Community-Based Sites’ Patient Visits

<table>
<thead>
<tr>
<th>Since project inception in October 2018</th>
<th>During Calendar Year 2018</th>
<th>During Calendar Year 2019</th>
<th>During Calendar Year 2020</th>
<th>During Calendar Year 2021</th>
<th>During Quarter Jan-Mar 2022</th>
<th>During Quarter Apr-Jun 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Visits with Medical Doctor</td>
<td>1,228</td>
<td>8</td>
<td>536</td>
<td>265</td>
<td>316</td>
<td>103</td>
</tr>
<tr>
<td>Patient Visits with Mid-Level Provider</td>
<td>10,388</td>
<td>7</td>
<td>2,006</td>
<td>3,217</td>
<td>4,122</td>
<td>1,036</td>
</tr>
<tr>
<td>Total Patient Visits</td>
<td>11,704</td>
<td>15</td>
<td>2,633</td>
<td>3,477</td>
<td>4,440</td>
<td>1,139</td>
</tr>
</tbody>
</table>

Since project inception there are 93 visits that listed no provider and 5 visits that listed both a mid-level and a doctor. As a result, the number total patient visits is higher than the doctor visits and mid level visits summed.
<table>
<thead>
<tr>
<th>Patient Visits</th>
<th>Since project inception in October 2018</th>
<th>During Calendar Year 2018</th>
<th>During Calendar Year 2019</th>
<th>During Calendar Year 2020</th>
<th>During Calendar Year 2021</th>
<th>During Quarter Jan-Mar 2021</th>
<th>During Quarter Apr-Jun 2021</th>
<th>During Quarter Jul-Sep 2021</th>
<th>During Quarter Oct-Dec 2021</th>
<th>During Quarter Jan-Mar 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Medical Doctor</td>
<td>1,228</td>
<td>8</td>
<td>536</td>
<td>265</td>
<td>316</td>
<td>77</td>
<td>59</td>
<td>71</td>
<td>109</td>
<td>103</td>
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<td>With Mid-Level Provider</td>
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<td>7</td>
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<td>3,477</td>
<td>4,440</td>
<td>1,092</td>
<td>1,060</td>
<td>1,069*</td>
<td>1,219</td>
<td>1,139</td>
</tr>
</tbody>
</table>

* There was 1 visit that didn’t say whether it was with MD or LCSW, and it is in the total but not in the breakouts.
NC-Step Appointments by Site
Appointments, Visit Kept, Rescheduled, Cancelled, No Show
January - March 2022
NC-STeP Community Visits by Site
by Provider Type
January - March 2022

<table>
<thead>
<tr>
<th>Site</th>
<th>Psychiatric Provider Visits</th>
<th>BH Mgr Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaufort</td>
<td>9</td>
<td>39</td>
</tr>
<tr>
<td>Bertie</td>
<td>53</td>
<td>47</td>
</tr>
<tr>
<td>Camden</td>
<td>8</td>
<td>112</td>
</tr>
<tr>
<td>Carteret</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Cherokee</td>
<td>5</td>
<td>170</td>
</tr>
<tr>
<td>Chowan</td>
<td>3</td>
<td>44</td>
</tr>
<tr>
<td>Craven</td>
<td>3</td>
<td>63</td>
</tr>
<tr>
<td>Currituck</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Duplin</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Gates</td>
<td>9</td>
<td>217</td>
</tr>
<tr>
<td>Hyde</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>MTW</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Pasquotank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perquimansville</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vidant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edenton</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- **Psychiatric Provider Visits**
- **BH Mgr Visits**
<table>
<thead>
<tr>
<th>Site</th>
<th>New Visits</th>
<th>Follow up Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaufort</td>
<td>19</td>
<td>29</td>
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</tr>
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<td>1</td>
<td>20</td>
</tr>
<tr>
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<td>11</td>
<td>160</td>
</tr>
<tr>
<td>Craven</td>
<td>1</td>
<td>43</td>
</tr>
<tr>
<td>Currituck</td>
<td>14</td>
<td>57</td>
</tr>
<tr>
<td>Duplin</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Gates</td>
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</tr>
<tr>
<td>Hyde</td>
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<td>212</td>
</tr>
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<td>MTW</td>
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<td>10</td>
</tr>
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<td>15</td>
</tr>
<tr>
<td>Edenton</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

NC-STeP Community Visits by Site
New and Follow-Up
January - March 2022
NC-STeP Status as of March 31, 2022

• 39 hospitals in the network. 38 live.
• 52,764 total psychiatry assessments since program inception
• 8,392 IVCs overturned
  – Cumulative return on investment = $45,316,800
    (savings from preventing unnecessary hospitalizations)
• Four Clinical Provider Hubs with 52 consultant providers
• Over 32% of the patients served had no insurance coverage
NC-STeP Status as of March 31, 2022

• 21 community-based sites.
• 11,704 total patient visits since program inception in October 2018.
  – 1,228 total patient visits with a psychiatrist
  – 10,388 total patient visits with a mid-level provider
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Brody School of Medicine | East Carolina University

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