

**Digitizing Care: Enhancing Efficiency and Accuracy through a Mobile Electronic  
Observation Record on an Inpatient Behavioral Health Unit**

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The Journal of Informatics Nursing

A paper submitted in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

South Dakota State University

2025

**Abstract**

Implementation of a mobile electronic observation record (MEOR) on an inpatient behavioral health unit increased staff compliance of 15-minute safety observations from 50.2% to 56.7% (OR = 1.32,  $p < 0.001$ ) and reduced median observation intervals by 15 seconds ( $p < 0.001$ ).

Key words: *Behavioral health, digitalization, mobile application*

## **Digitizing Care: Enhancing Efficiency and Accuracy through a Mobile Electronic Observation Record on an Inpatient Behavioral Health Unit**

Suicide occurs more frequently on inpatient behavioral health units than on any other hospital unit. From 2014 to 2015, 73.9% of all hospital suicides occurred on these units (Williams et al., 2018). Because of this, behavioral health staff monitor patients on behavioral health units in frequent intervals, most often every 15 minutes, to ensure their safety (Daniels, 2016; Janofsky, 2009; Jayaram et al., 2010). The observed behavior or location of the patient is then documented by staff into an observation record (Daniels, 2016). Compliance with these observations can be limited by staff fatigue, distraction, and workload, potentially reducing timely intervention (Daniels, 2016; Jayaram et al., 2010). Transitioning from paper-based documentation to a mobile electronic observation record (MEOR), or an electronic health record (EHR) with observation documentation capabilities, has the potential to improve adherence, facilitate auditing, and enhance patient safety (Grundgeiger et al., 2016; Lehtovuori et al., 2020; McLoughlin, 2021).

### **Available Knowledge: Review of Literature**

Paper-based observation charting has several limitations in ensuring compliance and accuracy. They cannot digitally timestamp observations, allowing staff to record times within the 15-minute interval even if delayed, which can lead to inaccurate or falsified documentation (Adaba & Kebebew, 2018; McLoughlin et al., 2021; Sefton et al., 2016). Paper charts also lack electronic alerts and digital reminders, which have been shown to improve compliance by reminding staff to complete an intervention (Lehtovuori et al., 2020; Mikhael et al., 2019; You et al., 2021). Additionally, paper records pose a higher risk of unauthorized access, while electronic health applications offer enhanced

security with managed logins and access tracking (Department of Health and Human Services, 2007a; 2007b; 2007c). A MEOR has the ability to overcome these limitations by incorporating timestamping, electronic alerts, and access management (Adaba & Kebebew, 2018; Lehtovuori et al., 2020; McLoughlin et al., 2021).

### **Rationale: Framework/Theories**

The Johns Hopkins Nursing Evidence-Based Practice model guided the literature review on behavioral health safety observations and mobile electronic records to develop an evidence based project and to improve patient outcomes, support clinical decision-making, and enhance the health care system (Dang & Dearholt, 2017). The Technology Acceptance Model by Davis (1989) informed the implementation of the MEOR, emphasizing that adoption depends on perceived usefulness and ease of use. Locsin's Theory of Technological Competency as Caring in Nursing (Locsin, 2005) guided the integration of technology in a way that supports patient care without disrupting the nurse–patient connection.

### **Specific Aims**

The population, intervention, comparison, outcome, and time (PICOT) question that guided this project was: Among registered nurses (RN), licensed practical nurses (LPN), emergency medical technicians (EMT), and mental health technicians (MHT) completing routine observations on an inpatient behavioral health unit (P), how does the implementation of electronic safety check observations through an application (I) compared to the usual routine of paper charting (C) affect observation compliance and timeliness (O) over 30 days (T)?

The outcomes that were measured and compared were (a) observation compliance, or the ability of staff to complete these observations within the allotted 15-minute interval; and (b) observation timeliness, or the amount of time a noncompliant observation was overdue when it was finally completed. Paper charts were used for 30 days and were audited for observation compliance and timeliness. Following this, a tablet-based MEOR called Hyperchecks was implemented for 30 days and audited for observation compliance and timeliness.

## **Methods**

### **Setting**

The project was implemented on a five-bed inpatient behavioral health unit. The unit provides immediate psychiatric crisis care for youth and adults, with four adult beds and one pediatric bed. From September 2023 to September 2024, the unit had 630 admissions. The unit accepts patients from ages 8-years-old to 80-years-old. The unit is restricted access only and secured with card access. The unit houses patients who are there on both a voluntary and involuntary basis. Voluntary patients make up 63% of all admissions. The average length of stay on the unit is 2 days. The average daily census on the unit is 2.1 patients (M. Miller, personal communication, October 28, 2024). The unit is located in a rural town in the Midwest. The population of the community was 15,410 as of 2023 (United States Census Bureau, 2023). The research team entered into a project site agreement with the facility prior to the start of the project (see Appendix A).

### **Sample**

The behavioral health unit is staffed with seven RNs, three LPNs, two EMTs, and eight MHTs. The unit is staffed per shift with one RN or LPN along with one EMT or

MHT. Per the standard order set, all patients are routinely observed every 15 minutes. All staff worked together to complete the observations within the allotted time frame. Prior to implementation, the standard practice was to document the observations on paper immediately after the observation took place. All staff were required to complete a Crisis Prevention Intervention class prior to working on the unit (M. Miller, personal communication, October 28, 2024).

### **Intervention**

A MEOR is a subset of an EHR that is specifically designed to document safety observations on an inpatient behavioral health unit via a tablet. For this project, a MEOR called Hyperchecks (Appendix B) was developed in collaboration with the project coordinator and a software engineer to allow behavioral health staff to electronically document safety observations in real time via an iPad. Hyperchecks was designed to incorporate features that were shown to increase intervention adherence as evidenced by the literature, such as electronic timestamping and alerts (Adaba & Kebebew, 2018; Lehtovuori et al., 2020; McLoughlin et al., 2021; Mikhael et al., 2019; Sefton et al., 2016; and You et al., 2021). The location and behavior options chosen for MEOR were identical to the ones on the paper observation record.

### ***Electronic Timestamping***

Hyperchecks incorporated electronic timestamping, which automatically recorded both the exact time each observation was completed and the identity of the staff member who performed it. Grundgeiger et al. (2016) demonstrated that timestamping improved documentation timeliness by 78%, making this feature essential. McLoughlin (2021) reported that timestamping helps prevent falsified documentation as it is unable to be

forged or tampered with by human influence. Hyperchecks was designed with immutable timestamping, ensuring that each observation's completion time was automatically recorded and could not be altered. Staff were instructed to document observations immediately after completion, consistent with paper charting. If an observation was completed outside the 15-minute interval, a warning icon appeared on the flowsheet, displaying the date, time, and the delay duration.

### ***Electronic Alerts***

Hyperchecks was integrated with electronic alerts indicating when an observation was overdue for submission. The literature indicated that electronic alerts improved both intervention adherence and patient outcomes (Lehtovuori et al., 2020; Mikhael et al., 2019; You et al., 2021). You et al. (2021) found a significant decrease in patient mortality after implementing an automatic alert system that triggered a rapid response based on vital sign data inputted into an EHR. Hyperchecks alerted staff with an audible bell noise when an observation was 1 minute past due. The 15-minute interval was reset once the observation was submitted.

### **Study of the Intervention**

#### ***Project Awareness***

Implementation preparation began 2 weeks prior to project launch. The project coordinator distributed flyers in breakrooms and on the unit to raise awareness (Appendix D) and formally introduced the project during the monthly team meeting via a presentation (Appendix E). All staff members responsible for routine observations were instructed to adopt the application for the 30-day period. A 1-hour educational session was conducted during a unit meeting to train staff, covering project objectives, step-by-

step application use (login, observation entry, patient assignment/discharge), and expectations for documentation. Visual aid handouts were distributed and displayed prominently on the unit as a reference throughout the intervention period.

### ***Recording Observations on Paper Charts for 30 Days***

Staff recorded observations into paper charts for a 30-day time period prior to the implementation of the application. Every 15 minutes, staff observed all of the patients on the unit to ensure their safety, and then recorded their locations or behaviors into a paper chart. This did not deviate from the facility's standard practice. The staff also documented the exact time that they completed all the observations in a separate "Observation Adherence Sheet," which did not contain patient data (See Appendix F). If the observation was noncompliant, or outside the 15-minute interval, the staff member made a notation next to the non-compliant check, as well as the actual time the observation was completed down to the second. The project coordinator provided a single wristwatch that was used by all staff completing the observations. The wristwatch stayed with the paper observation record to reduce the variation between different time capturing devices. At the end of each 24-hour period, the observation adherence sheet was collected by the manager and then scanned and emailed to the project coordinator.

The project coordinator totaled up the number of compliant and noncompliant observations for each 24-hour period. The amount of time that the noncompliant observations were overdue was also totaled up for each 24-hour interval. The data was tracked on the "Total Observation Adherence Sheet" for 30 days.

### ***Recording Observations via the MEOR for 30 Days***



The MEOR was then implemented for 30 days. Every 15 minutes, staff visually observed all patients on the unit and then recorded their locations or behaviors into the MEOR. The process of recording an observation in the application is demonstrated in Appendix E. The staff members would tap on the location or behavior of the patient. To make the process efficient, the next patient's observation box automatically opened up once the previous patient's observation was chosen. Staff recorded any observed detriments to the environment of care, such as contraband or ligature risk. Once staff completed their observations of all patients, the staff member documented and submitted the observations. A screen would appear, giving an overview of the location or behavior that has been selected for each patient. The staff member would review for accuracy, type in their initials, and then click confirm, which would officially submit the observation. The timer would then reset.

The time that the staff member submitted the observation was the definitive time that the observation was completed. If the timer reached 0:00 (minutes: seconds), the clock would begin to time how overdue the observation was. At -1:00, or one minute after the observation was due, an alert sound was triggered to remind staff to complete an observation. The alert going off at -1:00, rather than 0:00, was chosen to help reduce the risk of alarm fatigue.

The project manager filled out a "Total Observation Compliance Sheet," for each day of the 30-day project based on the information from the master flow sheet of the application (See Appendix F). The project manager recorded the number of non-compliant and compliant observations as well as the total overdue time in each 24-hour period of the 30-day project.

**Measures**

For both interventions, over the respective 30-day period, the total number of compliant observations was divided by the total number of observations completed to calculate a compliance rate. The total amount of time the noncompliant observations were overdue was found for both interventions. The average time interval between each observation was also determined for both interventions.

**Analysis**

Statistical analysis was conducted by the project coordinator using R and Excel software programs and verified by a university biostatistics professor. To assess observation timeliness, all observation time intervals for both interventions were parameterized into quantiles (0.10, 0.25, 0.50, 0.75, and 0.99) and analyzed using quantile regression to evaluate the intervention's effect across the full distribution. To evaluate observation compliance, longitudinal compliance data for both the pre- and post-intervention periods were modeled using a binomial generalized linear model with a logit link function, which is equivalent to logistic regression. This approach was selected because compliance is a binary outcome (1 = compliant, 0 = noncompliant) and thus not normally distributed. Logistic regression modeled the likelihood of compliant observations as a binary outcome, accounting for repeated measures. Descriptive statistics, including mean observation times and compliance rates, were also calculated to contextualize the analyses. These methods were used to determine the effect of the MEOR system on the efficiency and compliance of patient observation practices.

**Ethical Considerations**

The project was approved by the university's institutional review board prior to execution (see Appendix C). No patient identifiable information was collected, stored, or utilized in the project. Staff were informed of what data was collected, stored, and utilized prior to participating. The data stored is: (a) staff member initials indicating who completed the observation; (b) observation data, such as the location and behavior of the patient; (c) environment of care concerns; and (d) patient initials. Patients were listed as initials with no other identifiers. All digital observation data is stored on a Microsoft Azure cloud storage platform. Azure automatically encrypted the database within its cloud storage. Since the application uses Hypertext Transfer Protocol Secure endpoints to communicate with the database, the data is automatically encrypted in transit. Observation data was automatically emailed to the secretary of the unit as a portable document format (PDF) once the patient was discharged. The PDF was uploaded into the patient's EHR by the facility's secretary. Staff were paid their regular wage as checks occurred during their paid shift.

The project coordinator acknowledges the potential presence of a conflict of interest related to the possible financial success of the application. Hyperchecks is owned by Hyperchecks, a limited liability company (LLC). Hyperchecks, LLC is a private company co-owned and operated by both the project coordinator, Robert Baune, and software engineer, Claudio Tejada. Hyperchecks, LLC plans to eventually commercialize the application. Steps were taken to mitigate any bias, specifically by having the auditing of compliance be completed by individual staff members when using the paper chart and by electronic timestamping function when using the application. Both of these functions

were not able to be tampered with by the project coordinator. A university biostatistics professor, independent of the project, reviewed the data and verified its validity.

## **Results**

### **Paper Observation Record Results**

A total of 2,305 observations were completed during the 30-day period while using the paper charting system. Of these, 1,157 observations were deemed compliant, resulting in a compliance rate of 50.2%. Five observations were excluded from analysis because their intervals were either less than 1 minute or greater than 1 hour, in order to limit the influence of outliers. The mean time between observations was 15 minutes and 5 seconds ( $\pm$  2 minutes and 48 seconds). The mean overdue time was 1 minute and 51 seconds, and the cumulative overdue time across the 30-day period was 35 hours, 22 minutes, and 4 seconds. Full comparisons of results are provided in Appendix G.

### **MEOR Results**

In comparison, during the 30-day period using the MEOR system, 2,718 observations were completed. Of these, 2,718 were deemed compliant, resulting in a higher compliance rate of 56.7%. Sixty-six observations were excluded for the same outlier criteria. The mean time between observations was 14 minutes and 34 seconds ( $\pm$  1 minutes and 51 seconds). The mean overdue time was 1 minute and 51 seconds, and the cumulative overdue time was 35 hours, 47 minutes, and 49 seconds.

### **Quantile Regression Indicates Decreased Observation Time Intervals with MEOR**

All observation times for both interventions were parameterized into quantiles (0.10, 0.25, 0.50, 0.75, and 0.99) and analyzed using quantile regression to assess the effect of the intervention across the distribution of observation times. At the median (0.50

quantile), the MEOR was associated with a 15-second reduction in observation time ( $p < 0.001$ ). Significant reductions were also observed at the 0.10, 0.25, and 0.75 quantiles ( $-3.950$ ,  $-0.367$ , and  $-0.167$ , respectively; all  $p < 0.05$ ), indicating that the intervention consistently shortened observation times across the lower and middle portions of the distribution. The 0.99 quantile was the only point at which an increase in observation time was observed ( $+2.350$  minutes;  $p = 0.168$ ), which is most likely attributable to high outliers. Staff departures during the project did not affect data inclusion, as the statistical model accommodated incomplete longitudinal data. These findings demonstrate that implementation of the MEOR system led to a consistent and statistically significant reduction in observation times across most of the distribution, suggesting improved efficiency and timeliness of patient monitoring.

### **Logistic Regression Indicates Improvement in Compliance Rate with MEOR**

Logistic regression analysis indicated that the MEOR significantly increased compliance. On the log-odds scale, the intervention coefficient was  $0.277$  ( $SE = 0.057$ ,  $z = 4.87$ ,  $p < 0.001$ ), corresponding to an odds ratio of approximately  $1.32$ . On the probability scale, the intervention resulted in an average absolute increase in compliance of  $6.9\%$  ( $SD = 1.41\%$ ) compared with the paper-based approach.

### **Qualitative Feedback from Staff**

At the conclusion of the intervention, 4 staff members provided feedback regarding the MEOR. Appendix H details a full account of staff feedback. Feedback was relatively mixed. Some preferred paper charting, noting it allowed them to “write notes on mood or snacks, add an activity like coloring... [and] see what their activity was like during a different shift” and was not dependent on Wi-Fi or charging. Others valued

MEOR for promoting accountability and efficiency, stating that “submitting checks for all clients on the unit with a push of the button is a huge time saver” and reduces paper waste and administrative burden.

### **Discussion**

Implementation of the MEOR system significantly improved observation compliance and timeliness, increasing compliance from 50.2% to 56.7% (OR = 1.32,  $p < 0.001$ ) and reducing median observation intervals by 15 seconds ( $p < 0.001$ ). Mean observation intervals also improved (0:14:34  $\pm$  0:03:19 vs. 0:15:05  $\pm$  0:02:48). While a 6.9% increase may appear modest, even small improvements in adherence can be clinically meaningful in high-risk settings where missed or delayed observations may contribute to adverse outcomes, including inpatient suicide. This pattern indicates that the MEOR improved intervention compliance, likely by reducing lapses due to human error, distraction, or competing clinical demands. These findings align with prior studies demonstrating the utility of electronic alerts and automated timestamping to improve compliance and reduce documentation errors (Lehtovuori et al., 2020; Mikhael et al., 2019; You et al., 2021).

Although the MEOR improved compliance and timeliness of observations, the mean overdue time remained unchanged at 1 minute and 51 seconds. This finding indicates that when staff were delayed, the length of the delay was not shortened by the intervention. Staff may still have experienced unavoidable delays during certain periods, particularly in high-acuity scenarios. Staffing ratios, patient acuity, and emergent clinical events likely account for the most substantial observation delays, as these factors can divert staff attention to direct patient care priorities. Such delays may be largely outside

the influence of any observation recording intervention, whether paper-based or digital. This highlights the importance of considering workflow factors when interpreting compliance data.

The qualitative feedback provided valuable context for understanding the quantitative results and potential barriers to full adoption of MEOR. Staff appreciated the system's efficiency and accountability features, suggesting that the MEOR may enhance workflow once optimized. Staff did voice concerns about limited flexibility, reliance on network connectivity, and the inability to document nuanced behaviors. Incorporating staff recommendations, such as adding mood and activity field and simplifying use during high-acuity periods, could further improve adoption, user satisfaction, and ultimately patient monitoring outcomes.

Overall, this project demonstrates that a MEOR can enhance compliance, improve observation timeliness, and streamline quality assurance processes. While additional refinements are necessary to optimize usability and capture rich clinical detail, MEORs represent a promising step toward digitizing patient safety workflows and aligning clinical practice with regulatory standards for suicide prevention.

### **Impact on the Organization**

The MEOR enhanced the facility by improving staff compliance with safety observations, reducing paper use, and providing secure, auditable electronic records. Electronic timestamping and automated alerts promoted accountability and timely completion of observations, supporting adherence to established safety protocols. Although patient safety outcomes were not directly measured, these features likely contributed to a safer unit milieu by enhancing surveillance. The MEOR had a positive

environmental impact by reducing paper usage and by decreasing physical storage needs, minimizing the risk of lost or incomplete charts. Electronic data streamlined the auditing process, reducing manual chart reviews and preparing the facility for Joint Commission surveys, where adherence to observation protocols is a core patient safety metric (Paul et al., 2022). By holding staff accountable and reducing administrative burden, the MEOR contributed to a culture of safety and vigilance, which is essential for suicide prevention on inpatient behavioral health units.

### **Facility Cost**

The following summarizes the resources, associated costs, and potential financial considerations related to the implementation of the MEOR project. The tablet (\$638.99), tablet case (\$55.37), and necessary charging cords (included with the purchase of the tablet) were provided by the project coordinator for the facility to use free of charge for the duration of the project. A wristwatch (\$5) that acted as the universal clock for the paper observations was also provided. The only direct expense incurred by the facility was the time allocated for the 1-hour training session for 20 staff members, which was conducted during a routine monthly unit meeting, effectively negating training costs.

Hyperchecks was provided by Hyperchecks, LLC for the facility to use free of charge for the duration of the project. Hyperchecks cost an estimated \$2,794.94 to develop, which is conservative as it excludes any labor costs. The time it took to develop the program by both the project coordinator and the software developer was not factored into the cost. Appendix B details the cost breakdown in the creation of the MEOR.

Replication of this project at other facilities may incur substantial costs if an established



vendor is required; for example, a comparable application, VisibleHand, charges \$65 per bed per month (VisibleHand, 2022).

### **Sustainability**

Hyperchecks continues to be used by the facility post-project and is undergoing ongoing improvements, including integration of patient health information, utilization of the facility's active directory for unified staff logins, and adaptation of the user interface for iPhone compatibility. Active directory integration would allow staff to use a single username and password across multiple devices, facilitating smoother workflow transitions. Additional testing will be required to ensure interoperability with other electronic health record systems.

### **Recommendations for Future Practice**

Future research should focus on multicenter trials with longer follow-up periods to assess sustainability, scalability, and direct impact on patient safety outcomes. Mixed-methods studies incorporating structured staff interviews could further explore barriers to adoption, workflow integration, and the psychological impact of increased accountability. Cost-effectiveness analyses would also be valuable, weighing the up-front technology investment against potential reductions in adverse events, survey deficiencies, and administrative workload.

### **Barriers**

A notable challenge in this project was ensuring the accuracy and integrity of staff-reported observation data across differing documentation methods. With paper charts, staff were required to document the time of each observation, which may have

incentivized falsification if observations were completed late. Evidence of potential fabrication includes five observations that were recorded in less than 10 seconds.

Furthermore, the paper observation record and the MEOR differed in the amount of submissions allowed. For the paper observation record, staff were only able to complete 4 submissions per hour at strict 15-minute intervals. The MEOR allowed staff to submit multiple observations per hour, leading to the exclusion of 66 observations under one minute from analysis.

### **Limitations**

Despite the promising results, several limitations must be considered. The project was conducted on a single, small (5-bed) rural unit, which limits generalizability to larger or more resource-intensive settings. The 30-day intervention period may not fully capture long-term adherence patterns or sustainability, and no patient-level outcomes (e.g., suicide attempts, self-harm incidents) were measured to directly link improved compliance with clinical outcomes. Additionally, technological barriers such as Wi-Fi reliability and device battery life could affect real-world implementation and were not systematically evaluated.

### **Conclusion**

Implementation of the MEOR on a 5-bed inpatient behavioral health unit significantly improved observation compliance and timeliness. Electronic timestamping and alerts enhanced accountability, ensured timely documentation, and minimized falsified entries. Staff reported increased efficiency and decreased administrative burden, though some noted the continued value of paper for detailed clinical notes. Despite limitations of a small, single-site project, these findings suggest that MEORs can improve

adherence, streamline auditing, and support patient safety initiatives. Future adoption should include system refinement and EHR integration to sustain long-term clinical and operational benefits.

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## **Appendix A**

### **Facility Agreement**

#### **DNP Project Site Agreement**

Date: 2/1/25

This letter is in support of Robert Baune's DNP Project "Digitizing Care: Enhancing Efficiency and Accuracy through Mobile Electronic Observation Records on an Inpatient Behavioral Health Unit" at Lewis and Clark Behavioral Health Services. This project will demonstrate the use of an electronic observation application on an inpatient behavioral health unit.

We look forward to the results of the project.

Madeline Miller, BSN, RN, PMH-BC

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Signature

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## **Appendix B**

### **Hyperchecks**

Hyperchecks is owned by Hyperchecks, a limited liability company (LLC). Hyperchecks, LLC is a private company co-owned and operated by both the project coordinator, Robert Baune, and software engineer, Claudio Tejada. Hyperchecks was produced by Robert Baune and Claudio Tejada. It has been in production since August of 2022. Hyperchecks was programmed using Angular and CapacitorJs for the frontend and Sql Server for the backend. Visual Studio, Visual Studio Code, Sql Server Management Studio, Xcode, and Azure were all used as tools to program the application. Hyperchecks runs on both a desktop computer and an Apple iPad tablet. Apple Configurator was used to prevent access to other applications while using the tablet, such as Safari and the camera function.

Angular, the framework used for developing the web application, was free to use (Angular, 2024). Visual Studio, the integrated development environment used for the application development, was also free to use (Microsoft, 2024). SQL Server Management Studio, the cloud computing platform used for the application development was free to use (Microsoft, 2022). CapacitorJs, the program that allows for the cross-compatibility of applications with both Windows and Mac operating systems, was free to use (Ionic, 2024). Xcode 15, the program required to code the application for the iPad operating system, was free to use but required a MacBook Pro with an M2 pro chip, which cost \$2,128.94 and was paid for by Hyperchecks, LLC (Apple Inc., 2024). Hyperchecks required an SQL Server for it to run. Since the facility was unable to


provide a server, the project coordinator rented an SQL Server from Microsoft which costs \$73 per month (Microsoft, 2022).





In order to lock down the iPad with Apple Configurator, an Apple Developer Program membership was required, which cost \$99 per year and was paid for by the project coordinator (Apple Inc., 2024). The establishment of an LLC was also required to use Apple Configurator, which costed a one-time payment of \$299 and a yearly payment of \$49 (SD Registered Agents LLC, 2024).

## Appendix C

## South Dakota State Institutional Review Board

IRB-2024-194 - Initial: Not Human Subject Research (NHSR)

 do-not-reply@cayuse.com  
To: Callies, Dannica; Baune, Robert John - SDSU Student

 Reply  Reply All  Forward   
Tue 1/7/2025 7:21 AM



Date: 08/17/2025

PI: Dannica Callies, Robert Baune

Re: Digitizing Care: Enhancing Efficiency and Accuracy through a Mobile Electronic Observation Record on an Inpatient Behavioral Health Unit

**The SDSU Institutional Review Board has reviewed the above-referenced submission. The IRB has determined that this submission does not constitute human subjects research as defined under federal regulations [45 CFR 46.102 (e or f)] and does not require IRB approval.**

If you need to make changes to your study protocol, you should contact the above IRB before making the changes to ensure that the not human subjects research status will still apply. Please make sure that all other SDSU policies/requirements are met before commencing this activity.

Please maintain a copy of this letter in your study file for documentation that this project does not meet the regulatory definition of human subject research and does not require IRB approval. If you have any questions regarding our submission or review process, please do not hesitate to contact [irb@sdstate.edu](mailto:irb@sdstate.edu).

Keiji Horikoshi  
IRB Administrator

Division of Research and Economic Development | Institutional Review Board  
Mundt Hall 200, 5th Floor | Brookings, SD 57007 | 605-688-5561 | 605-688-5100 (fax) | [www.sdstate.edu/research](http://www.sdstate.edu/research)

## Appendix D

### Awareness Flyer

**ATTENTION!!!**  
**BEGINNING XX/XX/XXXX**  
 WE WILL BE USING AN  
**ELECTRONIC ROUNDING**  
**APP**

- The **application** will allow you to do your checks from an **iPad**. It is equipped with:
- **Electronic alerts** indicating when it is time for the next round.
- **Timestamping** that indicates the exact time a round was completed.
- There will be an **educational session on XX/XX/XXXX in the family learning center** which will go over how to use it – all staff are required to attend.
- **Questions?** Email **Robert** at [robert.baune@jacks.sdstate.edu](mailto:robert.baune@jacks.sdstate.edu)

The screenshot shows the 'Behavioral Health Center' app interface. At the top, it displays the date and time (10:00 PM, Mon Sep 23) and a timer (14:11) indicating the time until the next check. The interface is divided into sections for 'Room 201' and 'Room 202'. Under 'Room 201', there is a list of 'Locations' (Lounge, Room, Bed, Bathroom, Open Seclusion, Courtyard) and a 'Behavior Chains' section with various options (Sleeping, Snoring, Voiding, Showering, Seclusion, Restraints, Group, Participating, Eating, Phone, Visitor, With MD, Exercising, Fall, With Social Worker). A 'Constant Observation?' toggle is set to 'No'. At the bottom, there is a 'Check Submission' button. Annotations with arrows point to various elements: 'Location Options' points to the 'Locations' list; 'Behavior Options' points to the 'Behavior Chains' section; 'Timer (minutes:seconds) until next check' points to the '14:11' timer; 'Discharge / Transfer' points to a red 'X' icon; 'Constant Observations' points to the 'Constant Observation?' toggle; and 'Check Submission' points to the 'Check Submission' button.

## Appendix E

## Facility Presentation

# DIGITALIZING CARE:

## ENHANCING EFFICIENCY AND ACCURACY THROUGH A MOBILE ELECTRONIC OBSERVATION RECORD

Robert Baune, RN  
South Dakota State University  
College of Graduate Nursing

1

## BACKGROUND

- Behavioral health patients are observed by staff **every 15-minutes to ensure safety** (Daniels, 2016; Jacobs et al., 2003)
- Observations are recorded into a **paper-based observation record** (Jacobs et al., 2003; McLoughlin et al., 2016)
- Observations are **not always completed** in a timely manner, increasing patient risk. (Daniels, 2016)

**Lewis & Clark**  
Behavioral Health Services

The CORE Center  
1000 W 4<sup>th</sup> St., Yankton, SD 57501  
Crisis Line #: 1-800-765-3362

15 Minute Checks

DATE: \_\_\_\_\_ CLIENT DOB: \_\_\_\_\_ CLIENT NAME: \_\_\_\_\_

Time	Codes	Initials	Time	Codes	Initials	Time	Codes	Initials
0000			0000			0000		
0015			0015			0015		
0030			0030			0030		
0045			0045			0045		
0100			0100			0100		
0115			0115			0115		
0130			0130			0130		
0145			0145			0145		
0200			0200			0200		
0215			0215			0215		
0230			0230			0230		
0245			0245			0245		
0300			0300			0300		
0315			0315			0315		
0330			0330			0330		
0345			0345			0345		
0400			0400			0400		
0415			0415			0415		
0430			0430			0430		
0445			0445			0445		
0500			0500			0500		
0515			0515			0515		
0530			0530			0530		
0545			0545			0545		
0600			0600			0600		
0615			0615			0615		
0630			0630			0630		
0645			0645			0645		
0700			0700			0700		
0715			0715			0715		
0730			0730			0730		
0745			0745			0745		

Code	Description	Code #
1	Observing w/ staff	1
2	Waiting	2
3	Isolation	3
4	Restroom	4
5	With staff	5
6	With staff	6
7	Compliance	7
8	Group room	8
9	Outside	9
10		10

Shift Notes:

Meal Intake (M): Breakfast \_\_\_\_\_ Lunch \_\_\_\_\_ Dinner \_\_\_\_\_ Snack Intake (S) \_\_\_\_\_

Day shift sleep (P) hours: \_\_\_\_\_ Night shift sleep (P) hours: \_\_\_\_\_

Phone Calls/Volts From: \_\_\_\_\_

Behavior: ☐ Cooperative ☐ Uncooperative ☐ Social ☐ Avoidant ☐ Freq. redirection ☐ Restless

Mood: ☐ Bright ☐ Downcast ☐ Flat ☐ Irritable ☐ Angry ☐ Fearful ☐ Anxious ☐ Labile (up and down)

Additional Notes: \_\_\_\_\_

## SIGNIFICANCE

- If an observation is not completed on time:
  - The patient has **more time to complete suicide**
  - The staff have **less time to medically intervene** (Daniels, 2016)

## PROJECT PURPOSE

- **Purpose:** Develop and test a *tablet-based application* that can record patient observations and compare this with the current process of paper charting.
- **Outcome Measured:**
  - Observation compliance- the ability of staff to complete these observations in the allotted 15minute interval.
  - Observation timeliness– when noncompliant, how long does it take to complete the observation
- **Why?** To see if a tablet-based application affects safety checks compliance
- **Time Frame:** 30 Days

## ASSESSING OBSERVATION ADHERENCE VIA PAPER CHARTING

- For 30 days, observations will be made and documented with paper charts.
- The process is the same as you normally would, **EXCEPT...**
  - A watch will be on the rounding board.
  - After each round, staff will write the *actual time the observation was completed* (HR:MIN:SEC; based on the time on the watch) on the "Observation Adherence Sheet"
  - If the round was not done within 15 minutes, staff will put a check mark in the "Noncompliant?" column.

Observation Compliance Sheet

DATE: _____ PLEASE PLACE IN MANAGERS MAILBOX WHEN COMPLETED: THANK YOU					
Time	Actual Time Completed (HR:MIN:SEC)	Noncompliant? (Put checkmark if noncompliant)	Time	Actual Time Completed (HR:MIN:SEC)	Noncompliant? (Put checkmark if noncompliant)
0:00	0:00		8:00		
0:15	0:15		8:15		
0:30	0:30		8:30		
0:45	0:45		8:45		
1:00	0:00		8:00		
1:15	0:15		8:15		
1:30	0:30		8:30		
1:45	0:45		8:45		
2:00	10:00		8:00		
2:15	10:15		8:15		
2:30	10:30		8:30		
2:45	10:45		8:45		
3:00	11:00		8:00		
3:15	11:15		8:15		
3:30	11:30		8:30		
3:45	11:45		8:45		
4:00	12:00		8:00		
4:15	12:15		8:15		
4:30	12:30		8:30		
4:45	12:45		8:45		
5:00	13:00		8:00		
5:15	13:15		8:15		
5:30	13:30		8:30		
5:45	13:45		8:45		
6:00	14:00		8:00		
6:15	14:15		8:15		
6:30	14:30		8:30		
6:45	14:45		8:45		
7:00	15:00		8:00		
7:15	15:15		8:15		
7:30	15:30		8:30		
7:45	15:45		8:45		

## AFTER COMPLETING A ROUND...

- Fill out paper rounding form how you normally would.

- On the separate Observation Adherence Sheet document...



DATE: _____ PLEASE PLACE IN MANAGERS MAILBOX					
Time	Actual Time Completed (HR:MIN:SEC)	Noncompliant? (Put checkmark if noncompliant)	Time	Actual Time Completed (HR:MIN:SEC)	Noncompliant? (Put checkmark if noncompliant)
0:00	0:00		8:00		
0:15	0:16:32	✓	8:15		
0:30			8:30		

- Actual time (down to the second) it was completed based on the wristwatch

- Checkmark indicating noncompliant check

- At midnight of every shift, place the completed sheet in the managers mailbox

Please be honest with the time :)  
The more accurate the time, the more accurate the results for the project :)

### THE PROJECT COORDINATOR WILL TRACK THIS DATA OVER 30 DAYS

Total Observation Adherence Sheet

Day	Noncompliant Observations	Compliant Observations	Total Overdue Time (minutes:seconds)	Day	Noncompliant Observations	Compliant Observations	Total Overdue Time (minutes:seconds)
1				16			
2				17			
3				18			
4				19			
5				20			
6				21			
7				22			
8				23			
9				24			
10				25			
11				26			
12				27			
13				28			
14				29			
15				30			

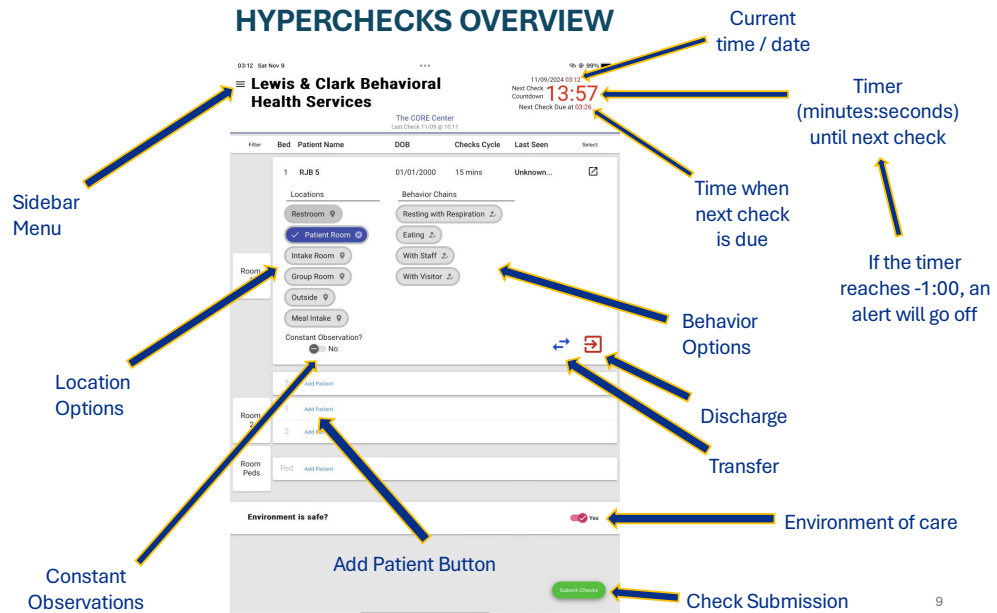
Total Observation

Day	Noncompliant Observations	Compliant Observations	Total Overdue Time (minutes:seconds)
1	6	90	3:30
2			

### HYPERCHECKS: A TABLET BASED APPLICATION FOR CHARTING SAFETY CHECKS

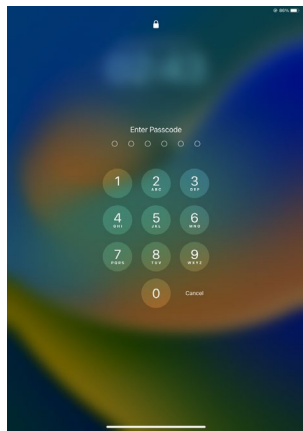
- After 30 days of charting rounds via paper, **we will begin to chart rounds via a tablet-based application**, which will be done via an iPad.
- **The observation adherence** or the ability of staff to complete these observations in the allotted 15-minute interval, **will be assessed when using the application**.
- **Why?** To see if a tablet-based application affects safety checks compliance
- **Time Frame:** 30 Days



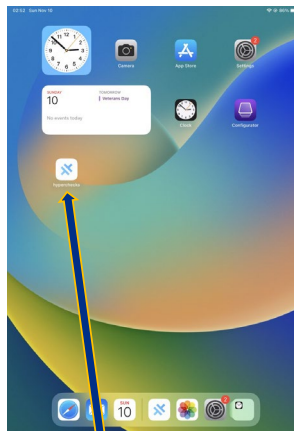


9

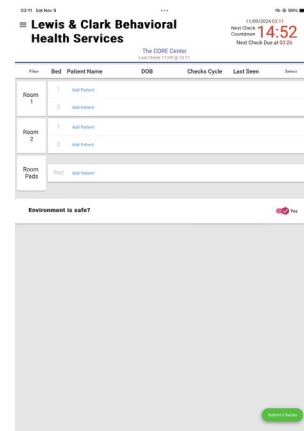
## OPENING HYPERCHECKS



1. Type in Passcode (123456)



2. Click on "Hyperchecks" app



3. The main screen will appear.

10

## ADDING A NEW PATIENT

1. Click "Add Patient" to add a patient to a room of your choosing

2. Click "Add a NEW Patient to this Bed"

3. Type in Patient initials

4. Submit

5. The patient will now show on the board

11

## SUBMITTING A CHECK

Current time / date

Timer (minutes:seconds) until next check

Time when next check is due

1. Click on the patient at the top of the list

2. The patient card will expand, displaying behavior and location options

12

## SUBMITTING A CHECK

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check 11/09 @ 05:53  
Next Check Countdown **5:53**  
Next Check Due at 05:28

Filter	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Select
Room 1	1	RJB 5	01/01/2000	15 mins	Patient Room	<input checked="" type="checkbox"/>

Locations: Restroom, **Patient Room**, Intake Room, Group Room, Outside, Meal Intake

Behavior Chains: Resting with..., Eating, With Staff, With Visitor

Constant Observation? ☐ No

Environment is safe? ☒ Yes

X Next Submit Check

3. Double tap on the location / behavior that you have observed

4. The next patient on the list will automatically expand.

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check 11/09 @ 05:53  
Next Check Countdown **5:23**  
Next Check Due at 05:28

Filter	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Select
Room 1	1	RJB 5	01/01/2000	15 mins	Patient Room	<input checked="" type="checkbox"/>
Room 2	1	CJT 6	01/01/2000	15 mins	Patient Room	<input checked="" type="checkbox"/>

Locations: Restroom, Patient Room, Intake Room, Group Room, Outside, Meal Intake

Behavior Chains: Resting with Respiration, Eating, With Staff, With Visitor

Constant Observation? ☐ No

Environment is safe? ☒ Yes

X Next Submit Check

13

## SUBMITTING A CHECK

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check 11/09 @ 05:28  
Next Check Countdown **5:23**  
Next Check Due at 05:28

Filter	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Select
Room 1	1	RJB 5	01/01/2000	15 mins	Patient Room	<input checked="" type="checkbox"/>
Room 2	1	CJT 6	01/01/2000	15 mins	Patient Room	<input checked="" type="checkbox"/>

Locations: Restroom, **Patient Room**, Intake Room, Group Room, Outside, Meal Intake

Behavior Chains: Resting with..., Eating, With Staff, With Visitor

Constant Observation? ☐ No

Environment is safe? ☒ Yes

X Next Submit Check

5. Double tap on the location / behavior that you have observed

6. Click "Submit Checks"

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check 11/11 @ 06:49  
Next Check Countdown **4:14**  
Next Check Due at 05:03

Filter	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Select
Room 1	1	RJB 3	01/01/2000	15 mins	Patient Room	<input checked="" type="checkbox"/>
Room 2	1	CJT 2	01/01/2000	15 mins	Patient Room	<input checked="" type="checkbox"/>

Locations: Restroom, Patient Room, Intake Room, Group Room, Outside, Meal Intake

Behavior Chains: Resting with..., Eating, With Staff, With Visitor

Constant Observation? ☐ No

Environment is safe? ☒ Yes

X Next Submit Check

Round Summary

Room: 1 RJB 3 Patient Room

Room: 2 CJT 2 Patient Room

Signed Initials: RJB

Cancel Confirm

7. Type in your initials

8. Click "Confirm" to submit the check

14

## SUBMITTING A CHECK

09:29 Sat Nov 9

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check: 11/09 @ 10:23

Next Check Countdown: **14:54**  
Next Check Out at 08:38

Filter	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Select
Room 1	1	RJB 5	01/01/2000	15 mins	Patient Room	<input type="checkbox"/>
	2	<a href="#">Add Patient</a>				
Room 2	1	CJT 6	01/01/2000	15 mins	Patient Room	<input type="checkbox"/>
	2	<a href="#">Add Patient</a>				
Room Peds	Find	<a href="#">Add Patient</a>				

Environment is safe? ☒ Yes

[Submit Checks](#)

TIP:

Clicking  
“Submit Checks” will  
resubmit their last  
location / behavior.

For example: If the  
patients were sleeping  
during the last round,  
and they all continue  
to be sleeping in the  
current round – you  
can simply just click  
“Submit Checks”

15

## ENVIRONMENTAL SAFETY DOCUMENTATION

03:58 Sat Nov 9

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check: 11/09 @ 10:23

Next Check Countdown: **3:57**  
Next Check Out at 08:20

Filter	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Select
Room 1	1	RJB 5	01/01/2000	15 mins	Patient Room	<input type="checkbox"/>
	2	<a href="#">Add Patient</a>				
Room 2	1	CJT 6	01/01/2000	15 mins	Patient Room	<input type="checkbox"/>
	2	<a href="#">Add Patient</a>				
Room Peds	Find	<a href="#">Add Patient</a>				

Environment is safe? ☒ No

[Environment 11/09/2024 @ 03:58](#)

- ☐ Other
- ☐ Combat Found
- ☐ Patient Out Of Boundaries
- ☐ Ligature Risk Found
- ☐ Door(s) Unrespectively Locked
- ☐ Door(s) Unrespectively Unlocked

[OK](#) [Submit Checks](#)

1. Click on  
toggle if an  
environmental  
safety issue is  
discovered

2. Click on  
toggle that  
best  
describes the  
safety issue  
discovered

3. Click on option  
that best describes  
where it was found

4. Click “Submit Checks”

03:57 Sat Nov 9

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check: 11/09 @ 10:23

Next Check Countdown: **3:42**  
Next Check Out at 08:25

Filter	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Select
Room 1	1	RJB 5	01/01/2000	15 mins	Patient Room	<input type="checkbox"/>
	2	<a href="#">Add Patient</a>				
Room 2	1	CJT 6	01/01/2000	15 mins	Patient Room	<input type="checkbox"/>
	2	<a href="#">Add Patient</a>				
Room Peds	Find	<a href="#">Add Patient</a>				

Environment is safe? ☒ No

[Where?](#)

- ☐ Bathroom
- ☐ Patient Room
- ☐ Intake Room
- ☐ Group Room
- ☐ Outside
- ☐ Meal Intake

[OK](#)

[Environment 11/09/2024 @ 03:19](#)

- ☐ Other
- ☐ Combat Found
- ☐ Patient Out Of Boundaries
- ☐ Ligature Risk Found
- ☐ Door(s) Unrespectively Locked
- ☐ Door(s) Unrespectively Unlocked

[OK](#) [Submit Checks](#)

16

## ELECTRONIC ALERT

**Lewis & Clark Behavioral Health Services**  
The CORE Center  
Last Seen: 11/10/2024 03:14  
Next Check: 03:14  
Next Check Due at 03:29

Room	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Notes
Room 1	1	Ad Patient				
	2	Ad Patient				
Room 2	1	CJT 6	01/01/2000	15 mins	Patient Room	☑
	2	RJB 5	01/01/2000	15 mins	Patient Room	☑
Room Public	Find	Ad Patient				

Environment is safe? ☒ Yes

Select check

Once 15-minutes has elapsed, the timer will begin timing how overdue the check is

**Lewis & Clark Behavioral Health Services**  
The CORE Center  
Last Seen: 11/10/2024 03:14  
Next Check: 03:29  
Next Check Due at 03:39

Room	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Notes
Room 1	1	Ad Patient				
	2	Ad Patient				
Room 2	1	CJT 6	01/01/2000	15 mins	Patient Room	☑
	2	RJB 5	01/01/2000	15 mins	Patient Room	☑
Room Public	Find	Ad Patient				

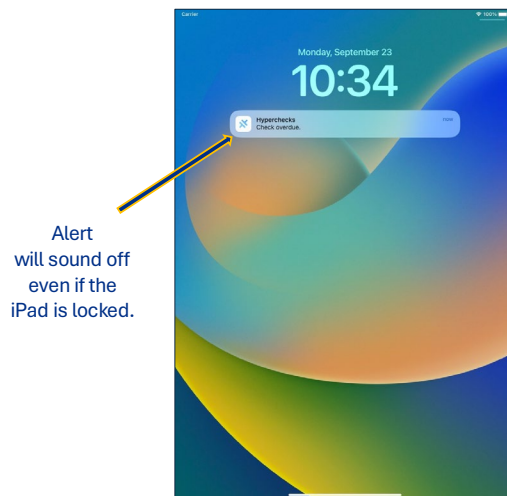
Environment is safe? ☒ Yes

Select check

At -1:00, an alert (with sound) will trigger

17

## ELECTRONIC ALERT



Enter a date range  
11/10/2024 - 11/11/2024  
MM/DD/YYYY-MM/DD/YYYY

☒ The CORE Center

Date & Time	CJT 2		RJB 3		Staff	Time Overdue (00:05:39)	58% Compliant (7/12)
	2	1	2	1			
11/10 23:59	PR	PR	RB	RB		00:01:08	⚠
11/10 23:48	PR	PR	RB	RB		00:00:26	⚠
11/10 23:32	PR	PR	RB	RB		00:01:16	⚠
11/10 23:16	PR	PR	RB	RB		00:01:16	⚠
11/10 23:00	PR	PR	RB	RB		00:01:16	⚠
11/10 22:44	PR	PR	RB	RB		00:01:16	⚠
11/10 22:33	PR	PR	RB	RB		00:01:16	⚠
11/10 22:16	PR	PR	RB	RB		00:01:16	⚠
11/10 20:31	PR	PR	RB	RB		00:01:21	⚠
11/10 20:15	PR	PR	RB	RB		00:00:12	⚠
11/10 20:00	PR	PR	RB	RB		00:00:12	⚠

The master flow sheet will have an icon next to it indicating what observations were noncompliant.

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## MASTER FLOWSHEET

00:00 Mon Nov 11

Enter a date range:  
11/10/2024 - 11/11/2024  
MM/DD/YYYY-MM/DD/YYYY

☒ The CORE Center

Print

Initials of staff who completed the observation

Filter by date

Time the observation was complete

Where the patient was observed to be

How late the observation was

This icon indicates the check was late

Compliance Statistics

Date & Time	Bed 1	Bed 2	Staff	Time Overdue (00:05:39)	58% Compliant (7/12)
11/10 23:59	PR	PR	RB	--:--:--	✓
11/10 23:48	PR	PR	RB	00:01:08	✓
11/10 23:32	PR	PR	RB	00:01:26	✓
11/10 23:16	PR	PR	RB	00:01:16	△
11/10 23:00	PR	PR	RB	00:01:16	△
11/10 22:44	PR	PR	RB	--:--:--	✓
11/10 22:33	PR	PR	RB	--:--:--	✓
11/10 22:28	PR	PR	RB	--:--:--	△
11/10 20:31			RJB	00:01:21	✓
11/10 20:15			RJB	00:00:12	✓
11/10 20:00				--:--:--	✓

19

## TO GET TO THE MASTER FLOWSHEET

03:34 Sat Nov 9

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check 11/09 @ 03:34

Next Check 11/09 @ 03:34  
Countdown 0:00  
Next Check Due at 03:34

Filter	Bed	Patient Name	DOB	Checks Cycle	Last Seen	Select
Room 1	1	Add Patient				
	2	Add Patient				
Room 2	1	CJT 6	01/01/2000	15 mins	Patient Room	☑
	2	RJB 5	01/01/2000	15 mins	Patient Room	☑
Room Peds	1	Add Patient				

Environment is safe? ☒ Yes

Submit Checks

1. To reach the master flow sheet, click the side bar menu icon

2. Click "Master Flowsheet"

22:29 Sun Nov 10

**Lewis & Clark Behavioral Health Services**

The CORE Center  
Last Check 11/10 @ 22:29

Next Check 11/11 @ 00:00  
Countdown 0:00  
Next Check Due at 00:00

Filter	Bed	Patient Name	DOB	Check
Room 1	1	TST 1	01/01/2000	15 min
	2	Add Patient		
Room 2	1	CJT 2	01/01/2000	15 min
	2	Add Patient		
Room Peds	1	Add Patient		

Environment is safe? ☒ Yes

Master Flowsheet

Add Location

Add Behavior

Add Environment Of Care

Reset

20

## TRANSFERRING A PATIENT FROM ONE BED TO ANOTHER

1. Click on Transfer Icon

2. Click the drop-down button and choose which room to transfer to

3. Click "move"

4. The patient has now been transferred

21

## DISCHARGING A PATIENT

1. Click the discharge button and click "Confirm" on the pop-up box.

2. The patient observation data will remain in the master flowsheet upon discharge

3. Once discharged, the application will automatically email the secretary with the data for the discharged patient (in a PDF format) that can be uploaded into the main electronic health record.

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**QUESTIONS? COMMENTS? CONCERNS? ISSUES?  
SUGGESTIONS?**

Robert Baune, RN  
South Dakota State University

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PHONE (Call/Text): 605-268-3607

Thank You!

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## Appendix F

## Observation Compliance Sheet

DATE: _____ PLEASE PLACE IN MANAGERS MAILBOX WHEN COMPLETED :) THANK YOU								
Time	Actual Time Completed (HR:MIN:SEC)	Noncompliant? (Put checkmark if <i>noncompliant</i> )	Time	Actual Time Completed (HR:MIN:SEC)	Noncompliant? (Put checkmark if <i>noncompliant</i> )	Time	Actual Time Completed (HR:MIN:SEC)	Noncompliant? (Put checkmark if <i>noncompliant</i> )
0:00			8:00			16:00		
0:15			8:15			16:15		
0:30			8:30			16:30		
0:45			8:45			16:45		
1:00			9:00			17:00		
1:15			9:15			17:15		
1:30			9:30			17:30		
1:45			9:45			17:45		
2:00			10:00			18:00		
2:15			10:15			18:15		
2:30			10:30			18:30		
2:45			10:45			18:45		
3:00			11:00			19:00		
3:15			11:15			19:15		
3:30			11:30			19:30		
3:45			11:45			19:45		
4:00			12:00			20:00		
4:15			12:15			20:15		
4:30			12:30			20:30		
4:45			12:45			20:45		
5:00			13:00			21:00		
5:15			13:15			21:15		
5:30			13:30			21:30		
5:45			13:45			21:45		
6:00			14:00			22:00		
6:15			14:15			22:15		
6:30			14:30			22:30		
6:45			14:45			22:45		
7:00			15:00			23:00		
7:15			15:15			23:15		
7:30			15:30			23:30		
7:45			15:45			23:45		

## AFTER COMPLETING A ROUND...

1. Fill out paper rounding form how you normally would.

**Lewis & Clark**  
Behavioral Health Services

The CORE Center  
1000 W 4th St, Portland, OR 97219  
Crisis Line #1-800-755-3352

DATE: \_\_\_\_\_ CLIENT DOB: \_\_\_\_\_ CLIENT NAME: \_\_\_\_\_

15 Minute Observation

Time	Code	Notes	Code	Notes	Code	Notes
0000						
0005						
0010						
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**Appendix G****Results**

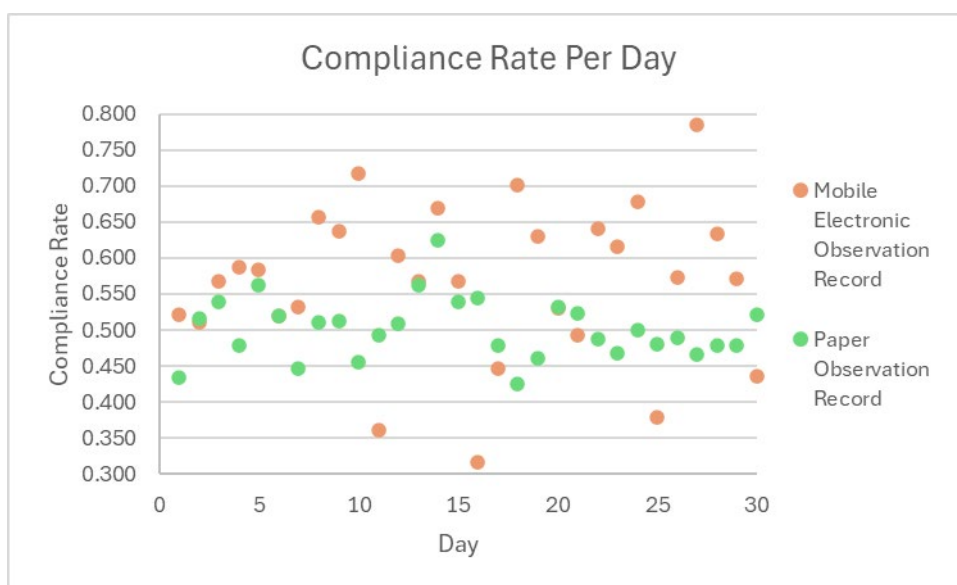
PAPER OBSERVATION RECORD (30 Days)	
# of Compliant Observations	1157
Total Observations	2305
Compliance Rate	0.5020
Total overdue time	35:22:04
Average overdue time	0:01:51
Mean Time Since Last Observation	0:15:05
Std Dev	0:02:48
Mode	0:15:02
Median	0:15:00
5 observations excluded (0:01:00<x<01:00:00)	

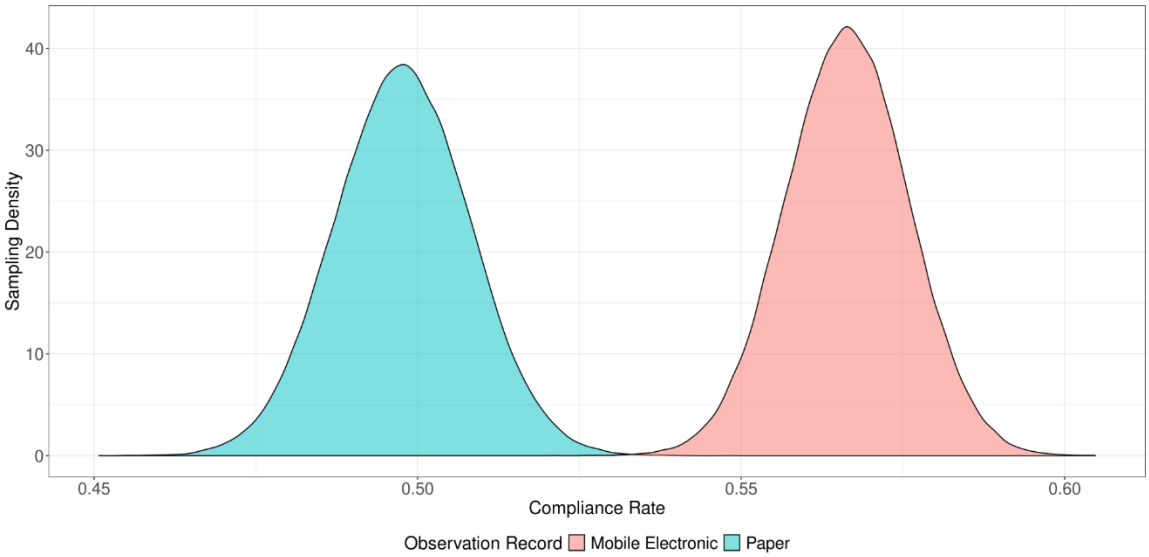
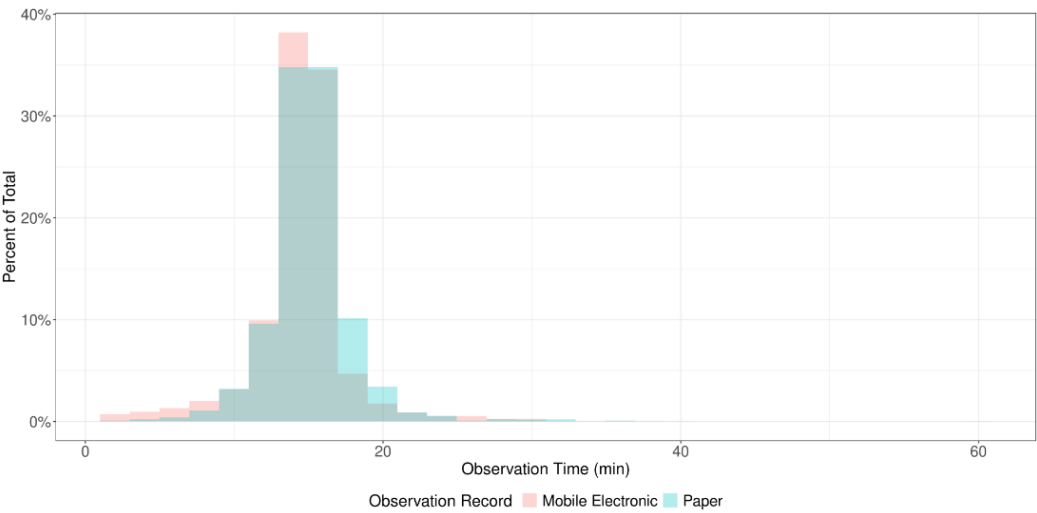
MOBILE ELECTRONIC OBSERVATION RECORD (30 Days)	
# of Compliant Observations	1606
Total Observations	2799
Compliance Rate	0.5738
Total overdue time	35:49:53
Average overdue time	0:02:50
Mean Time Since Last Observation	0:14:34
Std Dev	0:03:25
Mode	0:16:05
Median	0:14:45
66 observations excluded (0:01:00<x<01:00:00)	

Paper Observation Record Results (30 days)						
Day	Date	Average Time of Overdue Observation (HR:MIN:SEC)	Sum of Overdue Observation (HR:MIN:SEC)	Compliant Observations	Total Observations	Compliance Rate
1	3/4/2025	0:01:42	0:44:10	20	46	0.4348
2	3/5/2025	0:02:21	1:43:40	48	93	0.5161
3	3/6/2025	0:01:58	1:22:52	49	91	0.5385
4	3/7/2025	0:01:34	1:18:10	46	96	0.4792
5	3/8/2025	0:01:43	1:07:15	50	89	0.5618
6	3/9/2025	0:01:43	1:01:32	40	77	0.5195
7	3/10/2025	0:02:02	1:31:34	38	85	0.4471
8	3/11/2025	0:02:43	2:05:11	48	94	0.5106
9	3/12/2025	0:02:54	1:58:35	43	84	0.5119
10	3/13/2025	0:01:18	0:48:14	31	68	0.4559
11	3/14/2025	0:01:28	0:48:18	33	67	0.4925
12	3/15/2025	0:01:07	0:33:17	31	61	0.5082
13	3/16/2025	0:01:27	0:30:34	27	48	0.5625
14	3/17/2025	0:01:40	0:09:58	10	16	0.6250
15	3/18/2025	0:02:10	1:26:45	48	89	0.5393
16	3/19/2025	0:02:38	1:48:13	49	90	0.5444
17	3/20/2025	0:01:06	0:55:19	46	96	0.4792
18	3/21/2025	0:01:10	0:27:00	17	40	0.4250
19	3/22/2025	0:03:26	0:48:05	12	26	0.4615
20	3/23/2025	0:02:26	1:49:51	51	96	0.5313
21	3/24/2025	0:01:57	1:17:43	44	84	0.5238
22	3/25/2025	0:01:56	1:21:05	40	82	0.4878
23	3/26/2025	0:01:56	1:34:41	43	92	0.4674
24	3/27/2025	0:01:58	1:30:44	47	94	0.5000
25	3/28/2025	0:01:35	1:03:27	37	77	0.4805
26	3/29/2025	0:00:40	0:31:58	46	94	0.4894
27	3/30/2025	0:01:10	0:46:26	35	75	0.4667
28	3/31/2025	0:01:15	0:44:52	33	69	0.4783
29	4/1/2025	0:02:24	1:57:43	46	96	0.4792
30	4/2/2025	0:02:06	1:34:52	49	94	0.5213

Mobile Electronic Observation Record Results (30 days)						
Day	Date	Average Time of Overdue Observation (HR:MIN:SEC)	Sum of Overdue Observation (HR:MIN:SEC)	Compliant Observations	Total Observations	Compliance Rate
1	6/7/2025	0:04:43	1:58:08	50	96	0.521
2	6/8/2025	0:04:36	2:47:28	51	100	0.510
3	6/9/2025	0:03:12	1:28:37	54	95	0.568
4	6/10/2025	0:02:33	1:03:43	57	97	0.588
5	6/11/2025	0:02:34	1:17:04	63	108	0.583
6	6/12/2025	0:03:34	2:18:56	54	104	0.519
7	6/13/2025	0:04:35	1:20:54	49	92	0.533
8	6/14/2025	0:02:46	1:04:18	65	99	0.657
9	6/15/2025	0:03:22	0:55:51	51	80	0.638
10	6/16/2025	0:02:24	0:49:49	81	113	0.717
11	6/17/2025	0:02:43	1:32:25	34	94	0.362
12	6/18/2025	0:02:46	0:55:34	58	96	0.604
13	6/19/2025	0:01:58	1:03:02	59	104	0.567
14	6/20/2025	0:01:56	0:45:57	65	97	0.670
15	6/21/2025	0:03:24	1:35:19	59	104	0.567
16	6/22/2025	0:03:05	1:50:43	24	76	0.316
17	6/23/2025	0:01:50	0:50:01	33	74	0.446
18	6/24/2025	0:01:54	0:39:37	75	107	0.701
19	6/25/2025	0:02:13	0:45:48	73	116	0.629
20	6/26/2025	0:03:00	1:21:23	53	100	0.530
21	6/27/2025	0:02:08	0:47:11	38	77	0.494
22	6/28/2025	0:02:28	0:49:46	64	100	0.640
23	6/29/2025	0:02:20	1:08:41	61	99	0.616
24	6/30/2025	0:01:54	0:18:10	38	56	0.679
25	7/1/2025	0:03:33	1:10:00	28	74	0.378
26	7/2/2025	0:02:27	1:08:41	55	96	0.573
27	7/3/2025	0:02:32	0:32:32	84	107	0.785
28	7/4/2025	0:02:17	0:52:55	57	90	0.633
29	7/5/2025	0:02:31	0:34:41	36	63	0.571
30	7/6/2025	0:03:44	2:02:39	37	85	0.435

Sample Quantiles					
Paper Observation Record					
1%	25%	50%	75%	99%	
7.720	13.900	15.000	16.033	23.980	
Mobile Electronic Observation Record					
1%	25%	50%	75%	99%	
3.785	13.533	14.750	15.867	26.294	
Quantile Regression of All Observations (Pre- & Post- Intervention)					
tau	Intercept	Value	Std. Error	t value	Pr(> t )
0.01	7.720	-3.950	0.667	-5.926	0.000
0.25	13.900	-0.367	0.083	-4.415	0.000
0.50	15.000	-0.250	0.046	-5.475	0.000
0.75	16.033	-0.167	0.081	-2.061	0.039
0.99	23.980	2.350	1.703	1.380	0.168
Logistic Regression of Compliance Rate					
Value	Std. Error	z value	Pr(> z )		
0.277	0.057	4.865	0.000		





## **Appendix H**

### **Staff Feedback**

Staff 1: "I feel like you can get a little more in depth with paper but the tablet isn't that bad does cause a little bit of a problem when were super busy and can't do the check but other then that meh."

Staff 2: "I like the paper much better, for these reasons: Can easily see the name and birth date of patient, have more options to write notes or mood or snacks, add an activity like coloring, etc., more easily see what their activity was like during a different shift, can see exactly when they came in, does not malfunction when the Wi-Fi/network temporarily goes down from time to time, and not very bulky/do not need to worry about charging it, or accidentally breaking it. If we continue to use the app, I think some of these things would be nice to have for it."

Staff 3: "I personally would like to go back to the paper checks as we could be more specific on what the client is doing."

Staff 4: "I think the hyper checks are close to being a good replacement for the paper checks. I think they are good at promoting accountability to make sure the 15-minute checks are being done and then some. I've had moments on the unit where I have been the only staff member in the unit. Submitting checks for all clients on the unit with a push of the button is a huge time saver. Having an option as to concerning activities of the clients would be nice to have more options. Now, the paper charts had disposition and

mood of the client whereas the hyper checks so not. One could argue that all staff members could be charting more on the EHR especially concerning behaviors and moods. If there is a client who is in our services that I'm unfamiliar with, I always turn to either clinical notes or nurse's notes to get an idea what to expect. I have yet to see an old 15 min check sheet once it's dropped into the box. And there's paper waste. It saves cost of paying an employee to scan the documents, shred and dispose of them, and the water of a large amount of paper we go through in a weeks' time. I personally feel the hyper checks are on the right track once some of the bugs get worked out. Once they are dialed in, they could save the company money by increasing efficiency and reducing waste. We all know these days every penny counts.”