**Brainwriting Premortem: A Novel Focus Group Method to Engage Stakeholders and Identify Pre-Implementation Barriers**

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**ABSTRACT**

**Background** Many healthcare interventions encounter implementation challenges due to inadequate stakeholder engagement or identification of barriers. The brainwriting premortem technique is the silent sharing of written ideas about why an intervention failed. The method can engage stakeholders and identify barriers more efficiently than traditional brainstorming focus groups.

**Purpose** We evaluated the method during a transitions of care intervention in the Veterans Health Administration (VA). Clinicians from 10 VA facilities participated in 10 brainwriting premortem sessions.

**Methods** Using descriptive and content analytic methods, we assessed the quantity and quality of ideas generated, facilitator experience, and participant psychological safety.

**Results** In total, 217 unique ideas were generated. Many were deemed high quality. The written data was immediately available for analysis, allowing rapid feedback and real-time decision making. Participants reported high satisfaction and psychological safety.

**Conclusion** The brainwriting premortem approach is a novel, efficient alternative to brainstorming focus groups that can rapidly inform program implementation at minimal cost.

Stakeholder engagement and adapting an intervention to the local context are critical factors for the effective implementation of healthcare interventions.[1] Researchers, nurses, and quality experts typically interview key stakeholders and conduct pre-implementation focus groups with staff to help prepare for implementation. To identify potential barriers to program success, risk analysis brainstorming sessions are commonly used. Brainstorming sessions are 1 to 2 hour meetings where 6 to 12 people share opinions and ideas.[2] This approach is supported by a body of literature that describes how brainstorming can capture complex high-quality information from local voices.[2-4] Criticisms of the approach include the necessity for a trained facilitator team to moderate discussion, record the session, take notes, and monitor for individuals who dominate the conversation or take the group off topic.[5] Further, to ensure that all participants feel safe to present their ideas, facilitators must create an environment of psychological safety, where participants feel safe to speak up.[3,6] Last, the preparation and analysis of the data requires input from qualitative methodologists.[7]

The brainwriting method, which was designed for the marketing industry, addresses many of these criticisms.[8] Brainwriting is defined as the silent sharing of written ideas in a structured group setting.[5] During the 10 to 30 minute sessions, handwritten ideas are passed between participants.[9] The written approach can result in the generation of large numbers of quality ideas, while eliminating the need for a trained facilitator to keep the group on track, recording devices to capture conversations, and transcription services to write out audio recordings. This allows the data to be rapidly analyzed and used for real-time decision making.[10-12] Finally, the method is designed to foster an environment where everyone feels safe to share, making it an ideal setting for a project premortem.[11]

A project premortem[11] is a novel approach to identify potential barriers to program implementation from clinicians before the program has started. Participants are asked to imagine that a project has already been implemented in their organization or community. They then are told the program has failed, in that the program did not meet the stated outcomes and/or caused adverse events. Participants are then asked to identify what happened that caused the program to fail. The premortem is unlike typical critiquing session that focus on what *might* go wrong.[8] Instead, a premortem encourages the use of prospective hindsight by asking teams what *did* go wrong. A participant's task is then to generate plausible reasons for the project's failure. This approach allows people who have past experiences with similar projects or are worried about weaknesses to speak up to improve a project's chance of success. Although there are many potential advantages of a brainwriting premortem approach to quality improvement and implementation work, the method has never been formally evaluated.

The aim of this project was to describe and evaluate the experience of conducting brainwriting premortem sessions in the Veterans Health Administration (VA) during the nationwide implementation of a quality improvement project. We designed a mixed methods evaluation to understand the feasibility and effectiveness of the method on identification of barriers to program implementation. We measured this through evaluating the quantity and quality of ideas generated, participant satisfaction, psychological safety, and facilitator experiences.

**METHODS**

**Population and Evaluation Design**

The population included clinicians and administrators at 10 VA hospitals and primary care clinics involved in the rural Transitions Nurse Program (TNP). This 5-year mixed methods national quality improvement project is funded by the VA Office of Rural Health with support from the VA Office of Nursing Services. The project is designed to improve transitions of care for rural Veterans following an inpatient stay at an urban VA hospital.[13] Five pre-implementation site visits that included 5 hospitals and 9 primary care clinics were conducted during the fall of 2016 to evaluate how TNP would fit within the local context of each organization. In addition to the brainwriting premortem sessions, the implementation team conducted key informant interviews, ethnographic observations, and group sessions that included process mapping at each site. The study design, implementation, and evaluation was guided by the Practical, Robust Implementation and Sustainability Model.[14] The design and reporting of the qualitative data from this evaluation was performed per the Consolidated Criteria for Reporting Qualitative Research checklist.[15]

**Description of Brainwriting Premortem Protocol**

The brainwriting premortem protocol (Supplemental Digital Content, Protocol) was created with guidance from existing literature. [5,9,16-18] Protocol development was iterative and included feedback from the TNP implementation team. A standardized introduction was used to begin the brainwriting session to ensure consistency across groups. Semi-structured prompts were included in the protocol to allow for some flexibility in accordance with issues raised and level of participation within the groups. The prompts were primarily aimed at keeping a group focused. The protocol was pilot tested at 1 hospital and 2 allied primary care clinics. Adaptations were made based on facilitator feedback. Ongoing testing of the protocol during subsequent site

visits allowed for the refinement of the protocol, the data analysis strategy, and the reporting methods.

In the brainwriting premortem sessions, 4 to 10 participants sit around a single table. A facilitator introduces the program to be implemented. To help participants contemplate how the program failed, participants are asked to think about what challenges they have experienced implementing and participating in similar programs. Each participant is given a pen and a piece of paper. Once participants have written their initial ideas, they place their paper in the center of the table. They then choose another sheet of paper from the center (that contains someone else's initial thoughts), reads the idea(s), adding new ideas or expanding on another idea already listed on that sheet before returning it to the center of the table. If participants cannot come up with an idea in a reasonable time period, they can return the paper without writing anything. After approximately 10 minutes, the facilitator collects the papers and allows participants to reflect on the ideas generated and elaborate on them if desired. The written results are not returned to participants for comment or correction.

**Description of TNP Brainwriting Premortem Sessions**

The TNP brainwriting premortem sessions were conducted in a conference room within a VA hospital or clinic. Local site liaisons booked the room and invited leadership, administrators, and clinicians who would be impacted by TNP. Facilitators of the focus groups were members of the TNP implementation team. Six facilitators received training in the brainwriting premortem protocol (Supplemental Digital Content, Protocol). Although facilitators were asked to adhere to the protocol outline and script, they were allowed to make contextually-sensitive adaptations as needed. Examples included adding site-specific details to the script, allowing participants to

write for longer or shorter periods, and breaking up large groups into multiple smaller groups. The brainwriting premortem session was scheduled as part of a 60 to 90-minute group activity that included sharing information regarding the TNP and a process mapping activity. The facilitators were introduced to participants as members of the implementation team. Their professional and educational backgrounds were shared with participants, along with the purpose of the project. A post-brainwriting premortem survey was distributed after each session to assess participant satisfaction with the groups productivity, satisfaction with work processes of the group, fear of giving ideas to the group, and worry that their ideas would be criticized by the group. The surveys were scored on a Likert scale ranging from 1 to 5 (strongly disagree to strongly agree).

**Statistical Analysis**

Descriptive statistics for participant demographics, post-brainwriting surveys, and ideas generated are reported in this analysis. The number of unique ideas were quantified as those that only occurred once in the coding. Number of expanded ideas were quantified as an idea that had additional content added to the original idea. This was detected by a change in handwriting. Number of ideas that received agreement were quantified by ideas with checkmarks next to them. Rapid inductive, team-based content analysis of the brainwriting results were conducted in Excel 16.3 (Microsoft, Redmond, WA) by 3 coders to identify emergent themes and high-quality ideas. Ideas were deemed high-quality if they identified barriers that the research team could address through education, awareness, or adaptations to the intervention. The data were used to inform Transitions Nurse training and site-specific adaptations to the TNP, as needed. Examples of high-quality ideas generated from 1 hospital and associated primary care clinic are reported in

this paper. Facilitator experiences with hosting the brainwriting premortem sessions were collected using semi-structured interviews and analyzed using content analytic methods.

**RESULTS**

Brainwriting premortem sessions were conducted at 5 TNP implementation hospitals and 5 associated primary care clinics. Four primary care clinics did not conduct sessions due to challenges in scheduling or a requirement to pay overtime for staff to attend during their lunch hour. Attendance at the sessions ranged from 2 to 26 participants (n = 116; mean = 11.6) (Table 1). Registered nurses (n = 38) and licensed practical nurses (n = 11) were the dominant group in attendance, followed by physicians (n =17), social workers (n =10), pharmacists (n = 9), administrators (n = 4), medical residents (n = 3), medical support assistants (n = 2) and other healthcare support staff (n = 18). No other persons were present during the brainwriting premortem sessions besides participants and members of the TNP implementation team. Lack of participation by local staff was due to scheduling conflicts, absenteeism, or potentially, refusal to participate on the day of the site-visits.

Post-brainwriting premortem surveys were administered after 6 of the 10 sessions, with an average response rate of 73% across sites. Surveys were not distributed at 4 sites due to time constraints of clinical staff. Overall, participants reported satisfaction with their groups productivity (median: 4 [agree]) and work processes (median: 4 [agree]). Participants agreed (median: 4) that they were able to give ideas to the group and agreed (median: 4) that they had no concerns about criticism from the group, suggesting high levels of psychological safety (Supplemental Digital Content, Table 2).

Across the ten sites, the brainwriting premortem activity generated a total of 364 ideas regarding potential barriers to program implementation. Of those, 217 were unique ideas, 93 ideas were supported by other members of the group, and 15 ideas were expanded (i.e., other members of the group added content to a previous idea). Individual sites' performance ranged from 7 unique barriers identified for a group of 2 healthcare providers to 100 unique barriers for group of 11 healthcare providers (Table 1). Examples of high-quality ideas are listed in Supplemental Digital Content, Table 3.  The data created by participants was delivered in written format and was available for analysis immediately after the session (Supplemental Digital Content, Figure 1).

High-quality ideas from 1 hospital and an associated primary care clinic are presented in Supplemental Digital Content, Table 3.  Participants indicated concerns regarding the lack of role definition for the Transitions Nurse, the lack of clarity regarding Veteran eligibility information, and anticipated high volume for the TNP. Veteran-centric challenges, such as Veterans with disabilities who struggle to communicate via phone or have difficulty comprehending discharge instructions, homelessness, lack of transportation, and concerns of poor adherence to appointments and follow-up instructions were identified. Veteran-related communication challenges, either due to poor documentation in the electronic medical record, lack of phone, or incorrect number for the Veteran were additional potential barriers. Concerns in the primary clinic context included lack of appointment spots due to full schedules, lack of specialty services in rural areas, and the lack of current working relationships with primary care teams (Supplemental Digital Content, Table 3).

Participants at the example sites were highly engaged and offered solutions to remedy program barriers identified during the brainwriting premortem sessions (Supplemental Digital

Content, Table 3). Participants shared that hiring more Transitions Nurses would address anticipated high volume. Veteran-centric challenges could be addressed by providing education and materials at the Veteran's health literacy level and stressing the importance of follow-up appointments with their primary care provider. Veteran communication barriers could be addressed through beginning discharge education early and confirming address and telephone numbers prior to discharge. Primary care clinic barriers could be addressed by hiring more staff, opening more appointment slots, and effective scheduling. Last, the lack of relationships with primary care teams could be addressed through Transitions Nurses traveling to clinics to meet face-to-face with primary care colleagues.

The 10 brainwriting premortem sessions were hosted by 6 female (5 Caucasian, 1 African-American) members of the TNP team. Their educational backgrounds ranged from a bachelor's degree in nursing, a master's degree in public health, to a Ph.D. in anthropology. Three of the team members had previous experience hosting focus groups, while 3 had none. Fidelity to the brainwriting premortem protocol was reported by all facilitators for the set-up and introductory script. Adaptations to the protocol included the facilitator providing additional prompts. Some facilitators allowed participants to spend less than the 10-minute time allotment on brainwriting, for the group preferred to verbally discuss failure points and potential solutions. The verbally shared data were not included in these analyses.

Facilitators reported positive experiences running the sessions and the method was easy to implement. A noted benefit was the ability to collect a large number of targeted ideas, in writing, from a lot of people in a short amount of time. Although participants reported that the activity was fun, some didn't necessarily want to write. However, facilitators reported that for those who engaged in the process, the writing appeared to make participants think and provided

themes for others to comment and expand on. Facilitators indicated that participants appeared flattered that they were being asked their opinions, "*… almost as if no one had ever asked for their opinions before*." Though scheduling and recruiting participants was a challenge at all sites, facilitators reported that once people were in the room, there was a high level of engagement and excitement when sharing ideas with each other.

Facilitators shared tips to running a successful brainwriting premortem session. This included practicing with a friendly group before going on-site, ensuring participants understoodd the program being implemented and introducing sessions by stating, "We don't have the answers for you. This is about getting your feedback to inform this project at your site." An unintended consequence of the premortem approach was that some participants used the session to vent about their organizations.

**DISCUSSION**

Multiple methods are available to nurses to engage stakeholders and collect data pertinent to program implementation. The approach selected depends on the objective of the study, issues related to availability of participants, budget, and desired richness of the data.[19] In this nationwide, mixed methods quality improvement project, we successfully conducted 10 brainwriting premortem sessions led by facilitators with varying levels of education and group facilitation experience. The 10-minute writing sessions engaged 116 healthcare providers. Participants reported high satisfaction and psychological safety with the method.

The relationship between quality and quantity in idea generation are strongly linked, though the measurement of quality is subjective and often rated on novelty or usefulness.[20] Across the 10 sites, 217 unique barriers to program implementation were generated. Numerous

ideas were deemed high quality in that they were pertinent and actionable. The data was immediately available for analysis, allowing for rapid feedback to participants. The barriers and solutions enhanced the understanding of each sites local context, structures, and culture, resulting in targeted adaptations to the TNP intervention. The method was deemed user-friendly by facilitators and generally well-received by participants. Facilitators with no experience hosting a focus group and those with extensive experience reported the method easy to implement. Taken together, our results suggest that the brainwriting premortem method is a rapid, moderate-skill, inclusive approach to engage stakeholders and identify large numbers of high-quality barriers to implementation of an intervention. This approach could be used prior to implementation of new electronic medical record systems, new staffing models, or in diverse community-based health projects.

Our study adds to an existing body of literature on the importance of stakeholder participation and the assessment of barriers for improving the quality, relevance, dissemination and implementation of research.[1,21,22] The results of this study identified multiple key strengths of the brainwriting premortem method over other group-based elicitation approaches. The method is efficient and accessible. It can be successfully conducted in 10 minutes, compared to traditional focus groups that require up to 120 minutes.[19] The approach does not require a highly trained facilitator, opening up this method to groups outside of academic research circles. The method provides high-quality and actionable data at minimal cost that can inform real-time decision making. The method can be used in qualitative or mixed methods studies, as well as evaluations of programs or policies. Finally, the method can be taught to implementers and community members to continue to solicit stakeholder input to sustain programs or adapt interventions along the way.

An important finding of this study was the high productivity of participants, as witnessed by the large number of ideas written by each group. We propose this is because brainwriting facilitates fluid thought processes [8,9,16] and feedback. Participants were witnessed filling an entire page with ideas in minutes. As opposed to verbal elicitation approaches, participants could review others ideas, did not have to wait for others to stop talking, nor did they experience competing cognitive demands when attending to ideas of others while attempting to generate one's own idea.[8] Further, the risk of forgetting an idea, or determining it is no longer relevant, while waiting for a chance to speak was eliminated.[5] The method encouraged participation since individuals could not hide in the crowd and created a climate of psychological safety. Last, the method facilitated the sharing of ideas by clinicians that was focused on a single program and tied to implementation efforts.

Facilitator reported that the method appeared socially and cognitively stimulating. We believe this is because the premortem approach invites those who will be doing the work to provide input before the project begins. This builds engagement and an expectation that the project will not be perfect from the start.[11] In addition, the sharing of plausible failure points between people with multiple skills, roles, and backgrounds allowed for the cross-pollination of ideas. Although approaches such as Healthcare Failure Event Mode Analysis[23] could stimulate the sharing of potential risks to program implementation, the premortem's prospective hindsight approach addresses a range of cognitive biases. This is reported to minimize overconfidence, the planning fallacy, optimistic biases, and groupthink that affect many teams once a program has been approved.[10,24]

**Limitations**

This study should be interpreted in the context from which it was derived. This study has some limitations. First, we only examined a premortem approach. Future research is required to more closely examine the premortem approach versus a pre-implementation risk analysis type focus group. Such work is important given that the 2 approaches attempt to collect barriers to program implementation. The premortem approach may have been foreign to some, and more challenging to explain, however the minimization of cognitive biases is a significant advantage of the method.[24]

The generalizability of this study is limited by the intervention and characteristics of the study participants. We only evaluated brainwriting premortem focus groups. Comparison of this method to a brainstorming premortem approach or 1-on-1 interviews using the premortem question will reveal which method generates the greatest number and quality of ideas at the lowest cost and with the least expertise. Individual interviews may generate more ideas and richer data,[19] however they take more time (interview, transcription, analysis), would not have engaged as many participants, and would not have allowed group interaction. The brainstorming approach requires skilled facilitation to ensure full participation and detailed transcription of recordings.

Study participants were largely healthcare providers recruited from hospitals and clinics participating in the TNP. Participants were college educated, English speaking, literate members of society. The success of strategies for adapting this method to low literacy populations requires further investigation. All sessions were held in person. Adaptation of the protocol to a virtual (i.e., web-based)[17] or asynchronous format[16] is plausible, but would require an innovative electronic platform and highly engaged participants. Further, the difference in number and type

of participants in each group challenged our ability to interpret productivity across and between groups. Finally, post-brainwriting premortem surveys were not distributed at all sites.

**CONCLUSION**

The brainwriting premortem approach is a novel, efficient alternative to brainstorming focus groups that can rapidly inform program implementation at minimal cost. The method will engage diverse members of a team or community and allows for rapid collection of handwritten data that can be analyzed in real-time.  This can lead to immediate program adaptations that will facilitate successful adoption, implementation and sustainability of diverse healthcare or community-based programs.

**Table 1.** Hospital and Clinic Characteristics and Performance Results

| Site | Participants (N) | Total ideas generated (N) | Unique ideas (N) | Ideas with agreement (N) | Expanded ideas (N) |
|---|---|---|---|---|---|
| Hospital A | 12 | 24 | 19 | 0 | 0 |
| Clinic A | 18 | 59 | 29 | 34 | 7 |
| Hospital B | 26 | 50 | 39 | 0 | 0 |
| Hospital C | 15 | 50 | 30 | 23 | 4 |
| Clinic C | 11 | 100 | 25 | 34 | 2 |
| Hospital D | 9 | 10 | 14 | 0 | 0 |
| Clinic D | 2 | 7 | 7 | 0 | 0 |
| Hospital E | 13 | 29 | 25 | 0 | 2 |
| Clinic E-1 | 6 | 27 | 21 | 2 | 0 |
| Clinic E-2 | 4 | 8 | 8 | 0 | 0 |
| Totals: | 116 | 364 | 217 | 93 | 15 |

**Supplemental Digital Content**

**Table 2.** Post-Brainwriting Survey Results

| Site | Surveys (N) | Satisfaction [a] (Median) | | Fear/worry (Median) | |
|---|---|---|---|---|---|
| | | Group Productivity | Work Processes | Sharing Ideas | Criticism |
| Hospital C | 10 | 4.5 | 4 | 1 | 1 |
| Clinic C | 8 | 5 | 5 | 2 | 2 |
| Hospital D | 6 | 4 | 4 | 1.5 | 1 |
| Hospital E | 8 | 4.5 | 4 | 1 | 1 |
| Clinic E-1 | 5 | 4 | 4 | 1 | 1 |
| Clinic E-2 | 4 | 4 | 4 | 1.5 | 1.5 |

**Key**: Surveys not distributed at Hospitals A, B and Clinics A, D; [a] = 1: strongly disagree to 5: strongly agree

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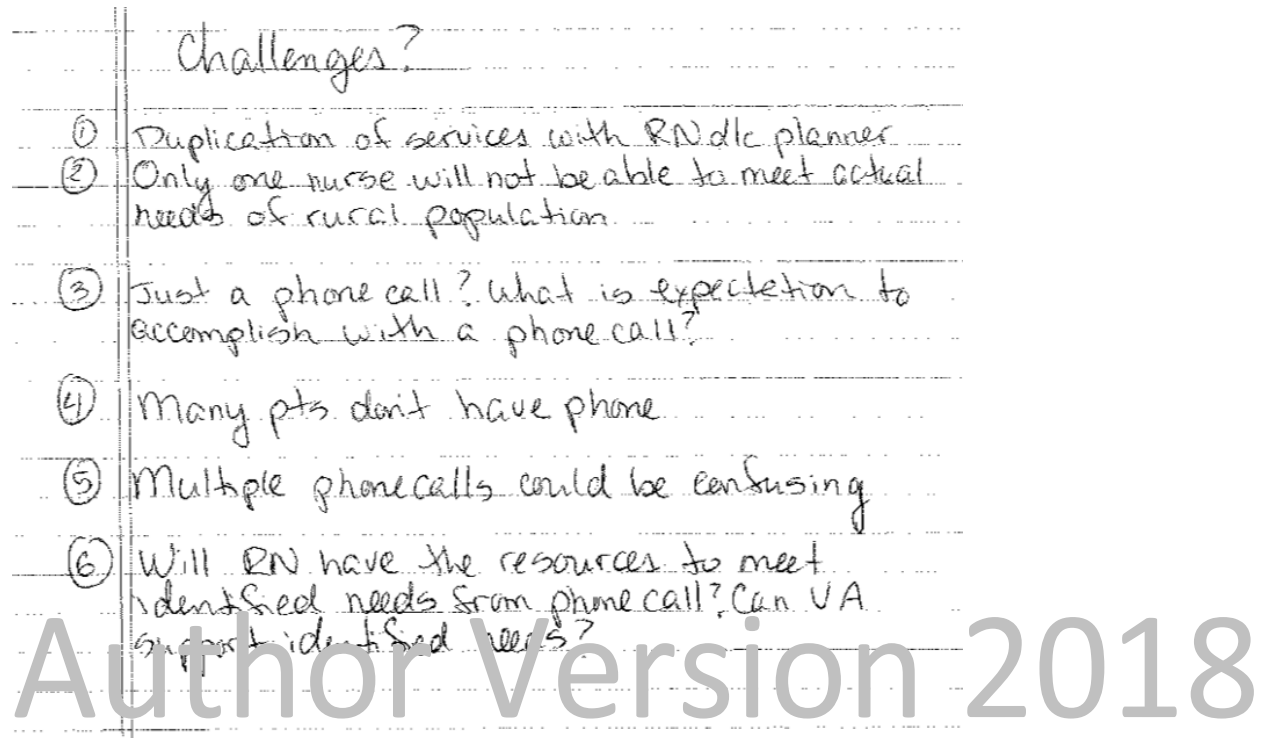
**Supplemental Digital Content**

**Table 3.** Brainwriting Premortem Thematic Analysis

| Themes | Subthemes (Frequency) | Examples of High Quality Ideas | Actions to Address Barriers |
|---|---|---|---|
| TNP issues | Role definition (13) | *Will the TN be notified automatically of a Veteran's admission? If not, then by whom?*<br><br>*How will concerns identified post-discharge be communicated with inpatient provider especially given changes in team members (attending/resident) every 2-4 weeks* | *None provided* |
| | Eligibility information (8) | *How to identify Veterans who fit the need (qualify)* | *None provided* |
| | Volume/demand (5) | *Large number of Veterans to manage for a single TN* | *Hire more TNs* |
| Veteran-centric challenges | Engagement/ adherence (13) | *Veteran has disabilities that challenge phone calls or reading discharge instructions*<br><br>*Homeless*<br><br>*Veteran is lack of participation in an active role in maintaining their health care won't show up for appointment/Veteran/family reluctant to participate)* | *Educate to the Veteran level*<br><br>*Counsel Veteran on importance to follow-up with primary care provider* |
| | Transportation (8) | *Veteran does not have transportation* | |
| Veteran communication challenges | Documentation/ communication (17) | *Poor communication CPRS/copy, paste in charts, missing information for follow-up*<br><br>*Education occurs on discharge*<br><br>*No phone/voicemail/answer phone/disconnected/incorrect number* | *Start discharge education on admission*<br><br>*Prior to discharge, update address and phone number* |
| Primary care clinic context | Full schedules (10) | *No appointment spots (at primary care)*<br><br>*Lack of specialty services in rural communities* | *Hire more, open more slots, effective scheduling* |
| | Rurality (3) | | |
| | Relationships (2) | *Lack of working relationship with primary care teams* | *Visit primary care sites* |
| VHA context | CHOICE Act (1) | *Hospital readmission to another (non-VA) facility* | |

**Key:** TNP = Transition Nurse Program; TN = Transition Nurse, CPRS = Computerized Patient Record System; VA = Veterans Health Administration

**Supplemental Digital Content:**
**Figure 1.** Example of Handwritten Data from Brainwriting Premortem Session



Challenges?

① Duplication of services with RN dlc planner
② Only one nurse will not be able to meet actual needs of rural population

③ Just a phone call? What is expectation to accomplish with a phone call?

④ Many pts don't have phone

⑤ Multiple phone calls could be confusing

⑥ Will RN have the resources to meet identified needs from phone call? Can VA support identified needs?

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