


# BMJ Open Quality Improving transparent team communication with the 'Glass Door' decal communication tool: a mixed methods analysis of family and staff perspectives

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## ABSTRACT

**Objective** To determine the value and perspectives of intensive care unit (ICU) healthcare professionals (HCPs) and families about the Glass Door (GD) decal team communication tool.

**Design** Quality improvement methodology was used to design, test and implement the GD. Uptake was measured through audit. Impact was assessed through mixed methodology (survey of ICU HCPs (n=96) and semi-structured interviews of HCPs (n=10) and families (n=7)).

**Setting** Eighteen bed, closed, mixed medical–surgical–cardiac ICU in a tertiary care, university-affiliated, paediatric hospital.

**Population** Interdisciplinary ICU HCPs and families of children admitted to the ICU.

**Intervention** A transparent template (the GD) applied to the outside of ICU patients' doors with sections for HCPs names, physiological goals and planned tests and treatments for the day. Medical staff completed the GD in rounds (AM and PM) and any HCP caring for the patient updated it throughout the day.

**Measurements and main results** After 3 months, 96% of 613 doors were employed of which 99% respected confidentiality. ICU HCPs reported improved understanding of the patient's plan (84% today vs 59% pre-GD,  $p<0.001$ ) and sense that families were up-to-date (79% today vs 46% pre-GD,  $p<0.001$ ). Based on semi-structured interviews, the GD promoted a shared understanding of the plan contributing to care continuity. The GD reassured families the team is working together and fostered family engagement in the care. Routine family experience surveys showed no change in families' sense of privacy during admission; families denied the GD's anticipated compromise of confidentiality.

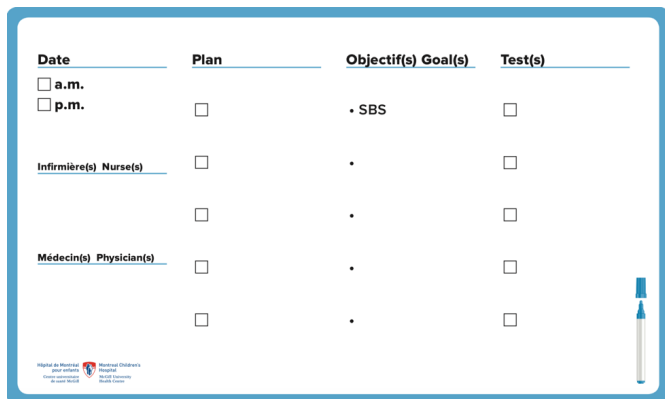
**Conclusions** The GD decal communication tool, visible on the patient's door, improved ICU HCPs' perceived knowledge of their patient's plan. The GD improved the shared mental model, facilitated teaching and information transfer and fostered family engagement. Challenges included knowing the rules for use and consistent application. Concerns initially raised by HCPs about confidentiality were denied by families.

## INTRODUCTION

Clear communication and effective collaboration between providers is critical to avoid medical error and ensure best care.<sup>1–4</sup> Communication errors are a significant source of medical error<sup>1 3 5</sup> and in the environment of the intensive care unit (ICU), these errors can have significant repercussions.<sup>6 7</sup> Multidisciplinary care teams, led by an attending intensivist, are associated with better patient outcomes,<sup>3 8</sup> yet this coordination is complicated by the multiple care providers involved. Care transitions also challenge consistency in care plans.<sup>9 10</sup> Handover mnemonics and tools, as well as daily goal checklists, have been shown to reduce handover errors and improve safety.<sup>9 11–15</sup>

In our ICU, healthcare professionals (HCPs) were unclear about patients' daily plans and did not perceive the team to be on the same page. Multiple information sources (paper chart, handover application (Vsign) and paper handover tool), numerous HCPs and a lack of standardised handover process were sources of this problem.

To encourage a flexible solution, we implemented a highly visible communication tool, on the patient's ICU door, shown to reduce communication safety events<sup>16</sup> (the Glass Door (GD), [figure 1](#)). Given that sustainability of change is predicated on continuous quality improvement (QI) through feedback and buy in,<sup>17 18</sup> we aimed to understand HCPs impressions of this tool. We also assessed family's acceptance of the GD, given that family satisfaction and engagement are important metrics and predictors of quality care.<sup>8 15 19–22</sup> Our objective was to assess whether the GD improved



**Figure 1** Glass Door template. Note: Staff indicate their name and contact number. SBS is for State Behavioural Score (ie, goal sedation level).

the team’s shared mental model and understand the perceived benefits and challenges of its use from the perspective of HCPs and families.

### METHODS

This manuscript was prepared in accordance with the Standards for Quality Improvement Reporting Excellence V.2.0 guidelines.<sup>23 24</sup>

#### Context

The project was conducted at a tertiary care, 18-bed, closed, medical–surgical–cardiac paediatric ICU (PICU). The ICU consists of 12 high acuity beds in the main ICU and 6 lower acuity beds (2:1 nursing, no invasive ventilation) in the acute care unit (ACU). The ICU’s multidisciplinary HCPs are responsible for both sites and included, at the time of the study, attending

physicians (9), ICU fellows (6), residents and students (40/year), an advanced practice nurse, respiratory therapists (50) and bedside nurses (80).

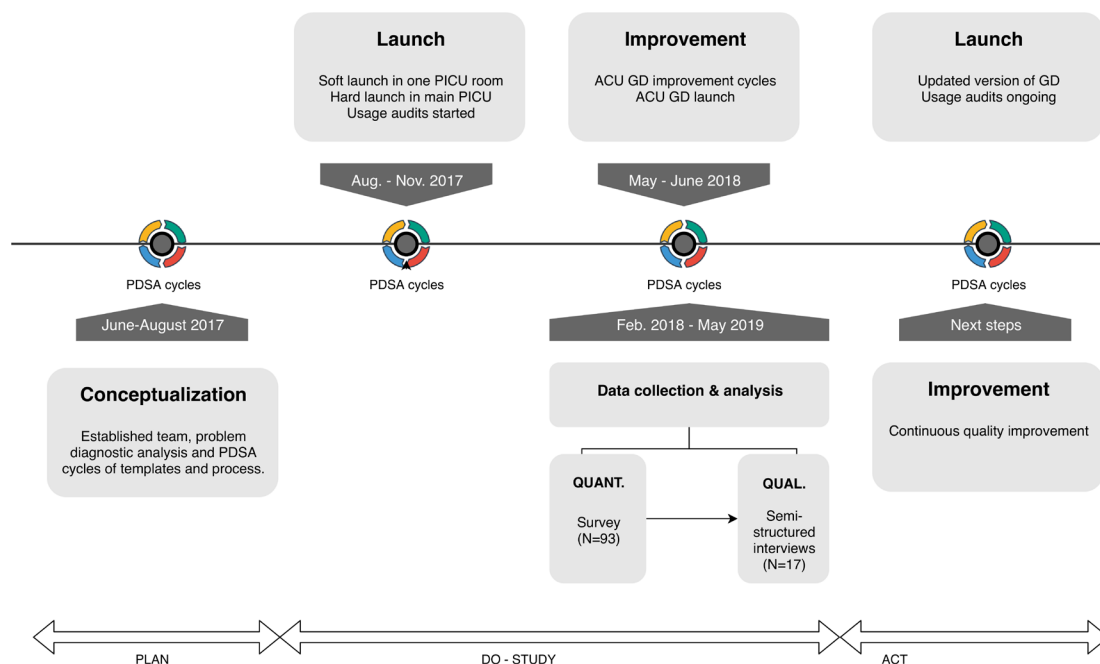
Multidisciplinary bedside rounds occur every morning with patient/family participation. Evening medical handover occurs at bedside, or in a conference room. Overnight, the ICU fellow leads another multidisciplinary bedside round. A printed signover sheet is used with variable accuracy and uptake. Patient charting and orders are paper based.

#### Intervention

A project team including two ICU attendings, an ICU fellow, a bedside nurse, an assistant nurse manager, an ICU social worker and two family partners aimed to design a team communication tool with the vision of: ‘Consistent, clear, up to date plan, conveyed visually for each patient’. Between June and August 2017, multiple iterations of the tool were created through Plan Do Study Act (PDSA) cycles<sup>25</sup> informed by qualitative feedback from the project and clinical team (figure 2). Trial versions were posted in the ICU hallway (figure 3) and on the ICU’s private Facebook page for feedback. After ensuring uptake in the main ICU (all rooms), this PDSA process was repeated to generate a simplified version for the ACU focusing on short-term and long-term plans.

#### The tool

The GD is a templated decal applied behind the patient’s GD allowing users to write directly on the glass with whiteboard markers (figure 1). Confidential information included patient’s full name, diagnosis or sensitive testing (eg, HIV) was not to be included on the GD.



**Figure 2** PDSA cycles and project timeline. ACU, acute care unit; GD, Glass Door; PDSA, Plan Do Study Act; PICU, paediatric intensive care unit.



**Figure 3** Examples of the Glass Door in use and pilot version with team feedback.

### Process for using the GD

Multiple PDSA cycles (figure 2), based on qualitative feedback from users, culminated in a process map for GD use. Direct feedback was given to users throughout implementation to improve process. Any member of the patient's healthcare team, including consultants (eg, physiotherapist or neurosurgeon), could write directly on the GD, although the PICU medical and nursing team members primarily completed and updated the tool. During rounds, completed items are erased with a tissue or gloved finger. The door is cleaned by housekeeping on patient transfer.

### Measures

Compliance with filling in the GD (*process measure*) was systematically audited, by a project assistant, on weekdays from November 2017–2018, using an electronic survey tool (SurveyMonkey) accessed via a tablet. The two balancing measures were families' assessment of privacy measured through routine family experience surveys at discharge and confidential information on the GD captured by audit. The principal investigator or project assistant educated HCPs when confidential information was noted.

### Study of the intervention

The impact of the GD was analysed using an explanatory sequential mixed methods design. Phase 1 employed a quantitative and qualitative HCP survey. Phase 2 employed qualitative semi-structured interviews informed by phase 1 results. A pre–post analysis was performed for phase 1.

### HCP survey (phase 1)

The anonymous, retrospective pre–post survey<sup>26</sup> was disseminated electronically between February and March 2018 through SurveyMonkey to 61 physicians by email, and on a private Facebook page to nurses and respiratory therapists (RTs) after being piloted within the QI team. The first five questions measured the HCP's perspective while working in ACU or PICU of (1) fully understanding

their patient's care plan and (2) families being up to date, both currently and 6 months prior (when the GD was not in use). This was assessed on a 5-point Likert scale with response options of: strongly agree/agree/neutral/disagree/strongly disagree. In the two last questions, HCPs selected from a list of perceived benefits of and barriers to the GD. Survey respondents could also submit their own answers which provided a qualitative component to the survey.

### Semi-structured interviews (phase 2)

The semi-structured interviews explored the survey results by asking HCPs and families about their experience with the GD and the challenges hindering its use. Using the explanatory sequential mixed methods design, we developed the qualitative interview guides.<sup>27</sup> HCPs were asked to describe their use of and experiences with the GD, prompts allowed them to elaborate on the benefits and challenges they encountered with the tool (eg, what was their first exposure to the GD, description of specific experiences they had with the tool, how the tool may have influenced their work). Questions about care plan information were first asked to families before focusing on their perceptions of the GD during the hospitalisation of their child (eg, how they see it being used, what they thought about it).

Interviews were conducted starting 1 year after implementation from November 2018 to May 2019. We identified HCP participants based on purposeful sampling to reach a group of that reflected the team composition.<sup>28</sup> HCPs were invited by email and private Facebook page, to participate. All HCPs who volunteered to be interviewed completed the interview. Recruitment of potential family interviewees was done by the social worker (MP) in consideration of the child's medical, social context including planned versus unplanned admission and length of stay. Families were interviewed as a unit (parents and child). Children were not interviewed. Interviews were done in person either at the hospital during the stay or at the families' home. A trained qualitative researcher (MM-C) contacted potential participants to ask for consent. Participants were offered a \$C10 snack voucher. Interviews were audiotaped and transcribed verbatim.

### Analysis

#### HCP survey

We used the paired t-test to measure pre and post agreement, from the HCPs' perspective, of (1) understanding the patient care plan and (2) families being up to date. Logistic regression was used to compare both perspectives across professionals. Three items that were yes/no or multiple-choice responses were analysed using descriptive statistics. Survey data were analysed using Stata (StataCorp. 2015. Stata Statistical Software: Release V.14).

### Semi-structured interviews

We identified the patterns emerging from the verbatim. Using Braun and Clarke's six-step framework,<sup>29</sup> an iterative

process, the data were inductively analysed systematically. Themes were identified and covered the utilisation of the GD in three contexts: individually, interprofessionally and with families. Discussion on the codes and themes were held to refine the definitions. Disagreements were resolved through consensual discussions between three team members (MM-C, SD and SZ).

### Ethical considerations

The McGill University Health Centre Research Ethics Board assessed this to be a QI project.

The hospital ethicist reviewed and approved the GD during the soft launch. She was supportive given the template did not include full name, nor diagnosis and was difficult to read in passing without a contrasting white background.

The HCP survey included consent information and explained that completion of the survey would be interpreted as consent granted. Written informed consents were obtained prior to commencing interviews.

### Patient and public involvement

Two family partners (KM and KL) were involved in development, testing and modifications, after PDSA cycles, to the intervention (GD). They were also involved in the analysis of survey results and preparation of the manuscript.

## RESULTS

Of 613 unique GDs audited, 96% of templates were filled in and 99% respected confidentiality. Breaches of confidentiality included diagnosis (eg, pneumonia) and one parent's phone number, which the parent had requested be placed on the GD. Family experience surveys (October 2017–January 2020) showed no significant change in families' perception of their privacy being respected (no special cause variation by run chart).

### HCP surveys

Of 93 respondents, 36 were physicians (39%), 50 were nurses (54%) and 7 were RTs (8%).

Of all the respondents, 90 (97%) agreed they saw the GD employed. HCPs' impressions of (1) their own understanding of the patient's plan and (2) families being up to date about the care their child received are shown in table 1. These results are presented for both the PICU and ACU before and after the GD's implementation.

Most frequently reported benefits were: 'improved communication', 'helped HCPs do their job' and 'consultants will know the plan'. Most common barriers reported were: 'inconsistent application', 'the plan won't be updated' and 'confidentiality'.

Logistic regression analysis of responses about the current situation in the ACU showed that physicians were three times more likely to agree that 'families are always up to date' compared with nurses and RTs (OR 3.12; 95% CI 1.26 to 7.74). As well, physicians were almost four times more likely to agree they had a full understanding

**Table 1** Survey (phase 1) responses

Healthcare professionals agree or strongly agree	Unit	Physicians, N=36	P value	RTs, N=7	P value	Nurses, N=50	P value	Overall, N=93	P value
Families are always up to date	PICU today	26/36 (72%)		7/7 (100%)		40/50 (74%)		73/93 (79%)	
	PICU 6 months ago	23/35 (66%)	<0.001	6/7 (86%)	0.17	13/49 (27%)	<0.001	42/91 (46%)	<0.001
I have a full understanding of the plans for my patient	PICU today	30/35 (86%)		4/7 (57%)		42/49 (86%)		76/91 (84%)	
	PICU 6 months ago	22/32 (69%)	0.03	4/7 (57%)	1.00	24/45 (53%)	<0.001	50/84 (59%)	<0.001
Families are always up to date	ACU today	17/35 (49%)		4/7 (57%)		9/49 (18%)		30/91 (33%)	
	ACU 6 months ago	6/32 (19%)	<0.001	3/7 (43%)	0.36	4/45 (9%)	0.04	13/84 (16%)	<0.001
I have a full understanding of the plans for my patient	ACU today	23/35 (66%)		6/7 (86%)		13/49 (27%)		42/91 (46%)	
	ACU 6 months ago	14/31 (44%)	0.003	3/7 (43%)	0.04	8/45 (18%)	0.08	25/83 (30%)	<0.001

ACU, acute care unit; PICU, pediatric intensive care unit; RT, respiratory therapist.

of the patient's plan compared with nurses and RTs (OR 3.70; 95% CI 1.53 to 9.09). When evaluating the situation 6 months ago, physicians were three times more likely to agree or strongly agree they had a full understanding of the patient's plan in the ACU compared with nurses and RTs (OR 3.07; 95% CI 1.16 to 8.11). No difference in agreement in perspective was found between physicians compared with nurses and RTs in their perspectives about the main PICU.

### Semi-structured interviews

Seventeen interviews, lasting between 21 and 34 min, were conducted (10 HCPs and 7 families). We recruited four nurses, three paediatric residents/ICU fellows, a staff intensivist, an RT and a pharmacist. HCP experience ranged from 1 to 5 years (30%), 5 and 10 years (40%) to more than 10 years (30%). Sixty per cent worked in PICU for less than 5 years, and most worked both day and night shifts.

Most (70%) children of parents interviewed were under 1 year of age and their length of stay ranged from 8 to 25 days. The reason for admission was an unplanned medical emergency in six of the seven caregivers interviewed and a planned surgical admission in one.

Themes and their corresponding categories, with illustrative quotes from interview interpretation, are presented in [box 1](#).

#### 'Being on the same page' (facilitators)

##### *Theme 1: beyond communication, shared understanding*

Perceptions on the objectives of the GD were consensual and culturally integrated within the unit. Even though the families were not systematically introduced to the GD, their perceptions were similar to HCPs regarding how and why the tool was being used. Morning rounds were the principal event for using the GD, that is, completing the template while discussing the daily plan. It served as a structural tool, allowing the team to share a common understanding.

The GD was perceived as an effective tool to enhance team communication, ensuring equal knowledge. The notion of 'being on the same page' was used by HCPs to describe their experience during rounds when information was written on the GD and is simultaneously visualised and consolidated together.

##### *Theme 2: holistic visualisation and sense-making*

HCPs highlighted the GD as a visual tool which allowed for direct follow-up and an opportunity to improve the continuity of care. The GD also provided a holistic view of the plan by having all the information in one location.

HCPs also used the GD to support teaching of junior colleagues. Explanatory diagrams ([figure 3](#)) were drawn directly on the GD. This facilitated junior HCPs' recall and assimilation of information from rounds. Writing on the GD was described as a complex cognitive task, requiring skills to understand and synthesise the information, as

### Box 1 Themes with illustrative quotes and suggested solutions

#### Themes

##### A. Being 'on the same page' (facilitators)

- Beyond communication, shared understanding
  - ▶ It is a good way to sort of keep everyone organized and on the same page. HCT06
  - ▶ It helps to structure the round as if you're interrupted, you're still able to get through it. HCT13
  - ▶ At the team level, it allows us to speak the same language, to be on the same page about what's going on. [...] It removes a barrier to having to look in the file all the time. So, if we try to agree [on a point] with the nurse, we both have in front of us [the Glass Door], it really allows us to have clearer communication within the team. HCT11
  - ▶ I've already observed that the nurses will be in front of the Glass Door and then use that as a tool to explain to the family what's going on for the day. HCT13
  - ▶ It helps us but it helps everyone in general. Whether it's the specialists, the doctors, the nurses, the parents, you know sometimes the children who are here, the immediate family can't always be there, sometimes it's the volunteers who stay to help the families so I think it's good... you know the name of the nurse, what's for dinner... yes, sometimes you're next to him, you ask yourself questions, it's written down, instead of disturbing, it saves time. F12
- Holistic visualization and sense-making
  - ▶ Another thing I remember seeing is for teaching sometimes, like sometimes we have some mnemonics, of things to remember, like for me, I am more with the ventilation, so I remember the fellow who is doing some teaching about criteria for extubating patients, so how to figure out already to take the tube out, and they were writing it on the door and it is like clear. HCT10
  - ▶ Sometimes it would still be written on the, on the door, and we can say "ooh, we talked about this yesterday, and we are not doing that, or you know, we made a decision already, so it helps with continuity". HCT10
  - ▶ It helped me, as I had little less experience, I didn't necessarily remember everything from the rounding, so the Glass Door allowed us to have a set plan that I could go back to. HCT04
- Information transfer
  - ▶ It does give me a sense of what is the overall goal and what the overall plans, so even though, I get some signs of the evening, it helps me to be a part of the rounds team, even if I wasn't there, when I go around, so it gives me a little bit of clear understanding. I should say of what the attending during the day was thinking of and what the staffs and fellows were thinking of during that time, so I can base my decisions on that a little bit more. HCT06
  - ▶ I feel like the communication is better, just to know the name of everyone who is taking care of patients, who is the nurse and probably helps them to know who is the RT, because if they don't see me, then they don't know, and yeah, better communication and better collaboration, more working as a team. HCT10
  - ▶ I add names directly when it's not written, so it's easier for me to reach out to everyone. HCT04
  - ▶ [Knowing the nurse's name] And then it creates a connection. A link to call her by her first name anyway. We're getting closer. F12
  - ▶ [It allows us to be] updated regularly, because it's been better, well, when you don't really speak English and people speak English, when

Continued

## Box 1 Continued

you write something on the board you don't have to go and ask other people what the plan is and so on. It's better. It's a good idea. F07

**B. Learning a new routine (challenges)**

## 4. Rules of the game

- ▶ It can be visually overwhelming [...] counterproductive, it is too busy. [...] we went through a phase where there was very little written on the door and we went through a phase that was way too much written on the door, and now we are back to I think a happy medium, where there is absolutely the essential data that's on there. HCT08
- ▶ [...] like the aspect of the information from the day before still being there, so it's not always clear, if anything, I would say maybe we could use different colours for, for different days of the week, or something and you would know this information is old and we are replacing it with new information. HCT 10

## 5. Consistency in updating

- ▶ Some boards you look at them, great like I have completed what I'm supposed to do. And sometimes it's like eeh, yes sometimes you ignore it, because you know the staff that was that day, it's probably not updated nothing that's there is gonna be relevant. So it depends. [...]The key to success is consistency. HCT03
- ▶ Then there are times when the Glass Door was simply not updated so... [...] I think that for the tool to be really effective it needs to be filled in diligently and then every day. F15

**C. Supporting parental understanding and empowerment (values)**

## 6. Reassuring families: a common plan

- ▶ For us it was very interesting, and if someday for whatever reason we missed the rounds, then we see right a way what, if like if there was any X-ray plan and blood test plan. F01
- ▶ It's certainly reassuring, but it also gives you a feeling that you're being well served. Meaning it's... it looks organized, more organized. Looks like the organisation's really here. It brings some comfort a little bit. F12
- ▶ I think they probably appreciate it knowing that we are taking the time to organise exactly what the plan is for their child. HCT06
- ▶ Especially when it comes to longer hospital stays: "Are we going in circles or are we moving forward? It helps to reassure the families". HCT04

## 7. Family empowerment and inclusion

- ▶ It's a way for them to share communication, and for us as well to make an input. F01
- ▶ For the parents, in fact, I think that there is an interesting potential in the sense that not all the parents can be there at the time of the medical briefing, so sometimes having small indicators on what is happening could lead to asking the right questions, but it would be good if it were explained at the door on arrival. F15
- ▶ The family said "Oh but you said that we are going to increase this until to like 80 mL, it's written there!", so they might have an anchor of what's... HCT03
- ▶ For the family it allows them to be more involved, to understand better. It gives them a sense of control, at least they know what's going on and then they know that there are results coming, sometimes to know, and then they ask for the result, it makes them feel good, it makes them feel a little bit more part of the care for the patient. HCT11

Continued

## Box 1 Continued

**Divergence in perceived confidentiality between healthcare professionals (HCPs) and families**

## 8. Fear of breach in patient's confidentiality

- ▶ I think a lot of people were quiet emmh worried about aspect of confidentiality, they were worried about people being able to stand in front of their door and know all the things about their child or their family, that were problematic, emmh, and so I think, it took a while for it to happen [HCPs' confidence in using the GD]. HCT09
- ▶ I think initially when [GD] was brought up by SZ at our staff rounds, there were immediate concerns about, emmh, about confidentiality. HCT08
- ▶ I don't know about confidentiality if that's an issue, like but I mean at the same time, I don't feel like families pay much attentions to what is written, so but I don't know if they find it emmh, like publicly, if there is something going on with their child, they don't necessarily want it to be in the hallway, that's the only thing. HCT10
- ▶ My initial emmh, question or concern that I had was whether or not to be honest we can keep it the way that it's confidential, so that others, other parents per say walking by, not necessarily that I think they are all going to stop in front and read every door. HCT03

## 9. No concern from families regarding confidentiality

- ▶ No, there is the child's name on the door. There's no other details. No, I never felt it was intrusive... [...] I think for them it's like more like reminders. Also, I think it's basically to keep some privacy because anyone can read on the outside door. I think it's for that purpose but, for sure, I would have liked more details. It's my son. The vision is different. F14
- ▶ In terms of confidentiality, no, I didn't think they had anything damaging that was indicated on the door. F15
- ▶ I think it's, it makes much easier for us and for anyone else, because usually that, all the information is dubbed into their charts, so no one has access, none of us [parents] has access to it, so I think it is pretty clear, I think we, we are very open with that. F01

well as make sense of it with the team; thus, being part of teaching on clinical reasoning and communication.

*Theme 3: information transfer*

Because of the shift work of the ICU HCPs, the GD facilitated recuperation of information, allowing HCPs to update themselves on the plan (eg, during change of shift or when covering for a break).

For both HCPs and families, knowing the names of the patient's daily care team allowed for connection and facilitation of exchanges.

*Learning a new routine (challenges)**Theme 4: rules of the game*

Motivation to use the GD was high among HCPs, yet hindered by uncertainty of the procedure (eg, when to erase information, what information to write). Guidelines and regular debriefings were suggested to clarify and reinforce its use by all HCPs.

*Theme 5: consistency in updating*

The main challenge of using the GD was consistency in updating the information. This was linked to the need for additional directives to standardise its utilisation.

Demonstrated leadership to use the GD could mitigate inconsistency.

### Supporting parental understanding and empowerment (values)

#### *Theme 6: reassuring families about a common plan*

In contrast to HCPs' concerns at implementation, families did not raise concerns of the GD breaching confidentiality. Families consulted the GD, as it allowed them to access information directly (eg, if they had missed rounds). This use was noted by HCPs, as well, when families would have otherwise have requested information they now found on the GD. Furthermore, using the GD demonstrated how the team was working to organise a common plan, thus comforting families.

#### *Theme 7: families' empowerment and inclusion in their child's care*

Seeing the GD used, triggered questions and the need for clarification for families. This implied a space for the family to be part of the plan discussion, as the GD information was available to them. While they were satisfied with the template and structure of the GD (figure 1), nurses and families suggested adding a space for parental messages.

#### *Theme 8: divergence in perceived confidentiality between HCPs and families*

While data analysis showed a convergence between the two groups of participants (HCPs and families) for all previous themes,<sup>1-7</sup> confidentiality was the sole theme that brought divergence between their perceptions. HCPs raised concerns and were worried at the beginning of the implementation that the GD would breach confidentiality and questioned how families would feel about their information being accessible. All families contradicted HCPs' concerns about confidentiality of their child's information. On the contrary, some would have liked to have more information shared through the GD. They perceived the tool as enabling them to access information they would not otherwise have, allowing them to be included in the plan and raise questions.

### Improving the GD (enhancement)

Suggested improvements, from HCPs and families, focused on inconsistent application, reinforcing the benefits of the GD and its inclusiveness (online supplemental file). Suggested solutions included:

- ▶ Systematically assign one person to consolidate the plan on the GD during rounds.
- ▶ Co-design standards for using the GD. Create a guideline (one-pager) for the team.
- ▶ Set an alarm to remind team to complete GD.
- ▶ Incentivise consistent utilisation.
- ▶ Use of a colour code to differentiate days to ensure information is up to date.
- ▶ Add a family box to allow them to communicate with the team.

## DISCUSSION

We report on the successful implementation of a highly visible, inexpensive, team communication tool, resulting in an improved, shared mental model of the patient. The tool was recognised by HCPs and families to facilitate information transfer, serve as a visual anchor to the plan, reassure families that the team is working together and foster family engagement in care.

Similarly to other communication tools used in ICU rounds, HCPs reported an improved sense of understanding for the patients' goals.<sup>11 12</sup> In contrast to most other ICU rounding tools showing improved team communication,<sup>11-14</sup> our tool is uniquely highly accessible to both HCPs and families.<sup>16</sup> We believe the GD's position outside the room, but right on the door, facilitated interdisciplinary and family engagement, in comparison to tools that reside in the chart, in the room or in nursing space. While the glass door of the patient room provided an ideal spot in our local setting to apply it, we can imagine a similar decal being applied to a regular door or wall beside the patient room. While the GD has a template, in contrast to daily goal sheets,<sup>11-15</sup> its content is more flexible. As well, given reports of the significant time physicians spend at computers versus with patients and rising healthcare spending,<sup>30 31</sup> this tool encourages bedside presence.

While there was a significant improvement in both HCP's sense of understanding of their patients' plan and their perspective of families being up to date in *both* ACU and PICU after GD implementation, there was lower agreement with these statements overall in reference to ACU. This difference might be attributable to the physical distance between ACU and PICU leading to less medical presence in ACU or that ACU's population is more chronically critically ill patients with multiple complex issues. These factors might also explain why nurses reported less agreement, in comparison to doctors, with these statements in ACU. Yet there was an important improvement for RTs in understanding the plan in ACU perhaps because their co-assignment to other hospital areas can result in them missing rounds.

Strengths of this project are the mixed methods design which canvassed input from all stakeholders, including families. Rarely has an ICU team communication tool been analysed from the patient or family's perspective, despite recommendations supporting patient and family-centred care.<sup>32-34</sup> In contrast to other work,<sup>35</sup> families in our study did not voice concerns with confidentiality, perhaps because the information on the GD was not directly from the health record. This also contrasted with HCPs concerns that the tool would jeopardise confidentiality. Similar to other studies, families interviewed in our study highlighted positive effects on family understanding<sup>15</sup> and engagement.<sup>35</sup> The GD addressed several previously identified barriers to communication, including coordination of multiple HCPs and communication breakdowns at shift change.<sup>36</sup> Given the valuable feedback from interviewed families, we would strongly

recommend that patients and families be integrated into improvement teams and their feedback sought on interventions.

With a greater understanding of the value and challenges of the GD, we have reassured HCPs that families were not concerned about confidentiality, clarified the process for using the GD, recognised that the ACU's GD needs further modifications and planned modification to the template (eg, adding mobilisation goals).

Adoption of new tools is challenging, as they create a disruption in the team's routine. QI is, by definition, asking for adaptive behaviours in a complex system.<sup>37</sup> For example, the study of Hewson and Burrell reported inconsistent application of a daily goals' checklist.<sup>38</sup> For a new element to become a consistent in the practice, research highlights the importance of its institutionalisation.<sup>39</sup> A change management strategy may be needed to implement new behaviours.<sup>40</sup> It is clear that further refinement of the tool is required in our ACU setting where physician and non-physician perspectives strongly differed.

The GD has now become part of daily business in the ICU, with a number of unintended applications. After seeing ICU providers writing on the GD, patients and families borrow the marker to draw/write on the inside glass (figure 3). Families and HCPs will note patient's own goals on the inside door to encourage patient mobilisation (eg, sit in a chair for 1 hour). To address miscommunications, surgeons leave their suggestions directly on the GD. As well, glass windows in conference rooms are now used for teaching and meetings to ensure common understanding, at the minimal cost of a whiteboard marker. Lastly, data on the GD is now used in audits for other studies.

Methodological limitations of this study include its generalisability, being a single centre intervention; however, there has already been interest from other local and Canadian ICUs (adult and paediatric) to spread the innovation. Our relatively small survey sample size led to wide CIs in the logistic regression that still provided important information about differences in perception between HCPs. Lastly, we did not measure safety event outcomes; nevertheless, improved communication and multidisciplinary care coordination are associated with better patient satisfaction, staff retention and patient outcomes.<sup>8 19–22</sup>

## CONCLUSION

The GD daily team communication tool, easily visible on the door of the patient's ICU room, was perceived to improve the ICU team's shared knowledge of the patient's plan. Utilisation of the GD also allowed for information consolidation, structured communication and an improved sense of continuity of care. The GD reassured families that the team is working together and fostered family engagement in the care. Qualitative feedback from HCPs and families provided important insights into areas of potential improvement facilitating ongoing QI.

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### **Summary of the solutions suggested by HCPs and families to reinforce the facilitators or overcome challenges**

- a. Systematically assign one person to consolidate the plan on the GD during rounds
  - *What we did was to really delegate it was like a role to one person who did that, and then we said well, for the tour, since it's not your patients, you're going to do the chart. That meant that there was no confusion, like many people trying to write different things. HCT10*
  - *My suggestion would be, again this is my personal preference, but to have at least one dedicated person to be updating the Glass Door during the report (round). HCT02*
  
- b. Co-design standards for using the GD. Create a guideline (one-pager) for the team
  - *The use of the board is something you learn on the job when you arrive. It's not clearly defined who writes what and what exactly is the information you want. You learn it if you pay attention to it in the background. Maybe there could be some kind of document where the role and what should be written on the board is explained. It doesn't have to be long, a one page story for example. So that maybe everyone would have it in mind and then make sure that the role is clarified... HCT10*
  - *Mentioning what is important to include. HCT02*
  - *We're using acronyms, so I found myself using little writings to write sentences and I erased it all to put something that might be more concise. So just little things like that in terms of making sure we're uniformed with the using the glassdoor as much as possible. HCT03*
  
- c. Set an alarm to remind team to complete GD
  - *Maybe, I don't know, cause again this is all falling into another person in saying like "okay, every Monday, Wednesday and Friday has, has a glassdoor being like updated?", whatever, something like that, which might be prompted by the nurse or whoever. Cause like there are times the glassdoor is like, it like not used at all specifically. [...] During the day or have certain, certain like days or times in which like the glassdoor should be, like everyone knows it's glassdoor time. yes, (a reminder) exactly, cause then you might be reading the glassdoor from 3 days ago. HCT04*
  
- d. Incentivize consistent utilization
  - *I would suggest is to continue to reinforce the importance in new staff and existing staff, emmh to make it become a culture on our unit, to ensure that it's been filled out, even at the end of the shift if necessarily, but at least it's being filled out in terms of benefit for the next nurse or team mate. [...] I think something that could be beneficial in terms of either the research, or in terms of disseminating the importance of the glassdoor. It's important to, from my perspective have little reminders within a few months, you know to have or few weeks, however the timeline best maybe even through evidence-based research suggest to get something across to staff. HCT03*
  
- e. Use of a color code to differentiate days to ensure information is up-to-date
  - *[to improve updates] Going forward maybe if we have a different color (per day) just to make sure for the same day so everybody is on the same page. HCT11*
  
- f. Add a family box to allow them to communicate with the team