Improving Code Status Discussions on the General Internal Medicine Ward with Simulation-Based Resident Education

Stephanie Gottheil MD, Christine Ibrahim MD, FRCPC and Robert Sibbald MSc

Abstract
Code status discussions (CSDs) address patient wishes regarding resuscitation. At teaching hospitals, CSDs are often conducted by junior residents. However, residents often omit the prognosis and outcomes during these conversations. Our aim was to develop a brief educational intervention to improve resident skills in leading CSDs.

Twenty-four junior internal medicine residents participated in our study. This intervention consisted of three parts: a simulated CSD, an educational session, and a second simulated CSD. Simulations were evaluated by faculty using a 15-item checklist and senior residents were trained as standardized patients.

Resident checklist scores improved significantly after our intervention from 8.8 to 11.1 (p = 0.012). Resident comfort with leading and documenting CSDs also improved. This intervention is easily repeatable, and can be implemented for trainees of different levels and different departments. Our next educational session will be improved based on feedback, as well as areas of weakness identified by our checklists.

About the Authors
Stephanie Gottheil is a PGY3 resident in Internal Medicine at Western University in London, Ontario. Christine Ibrahim is a PGY5 fellow in Endocrinology at the University of Toronto. Robert Sibbald is the clinical and corporate ethicist for London Health Sciences Centre and adjunct professor in the Department of Family Medicine at Western University in London, Ontario. Correspondence may be directed to stephanie.gottheil@lhsc.on.ca.
Résumé
Les discussions sur les codes ayant trait à la réanimation (ou CSD pour Code status discussion) abordent ce que les patients souhaitent en matière de réanimation. Dans les hôpitaux d’enseignement, ces discussions sont souvent menées par des résidents juniors. Cependant, au cours de ces conversations, les résidents omettent souvent de discuter de pronostics et de résultats. Notre objectif vise à élaborer une brève intervention éducative pour améliorer les compétences des résidents dans la conduite de ces discussions.
Vingt-quatre résidents juniors en médecine interne ont pris part à notre étude. L’intervention se divisait en trois parties : une discussion simulée, une séance éducative et une deuxième discussion simulée. Les simulations étaient évaluées par des professeurs au moyen d’une liste de contrôle de quinze éléments et des résidents séniors ont été formés pour agir à titre de patients. Les résultats obtenus par les résidents juniors se sont avérés significativement meilleurs après notre intervention, passant de 8,8 à 11,1 (p = 0,012). Les résidents étaient également plus à l’aise de conduire la discussion et de fournir de la documentation. Cette intervention est facilement reproductible et peut être offerte aux apprenants de différents niveaux et de différents services. Notre prochaine séance éducative sera améliorée à partir de la rétroaction obtenue, ainsi que des faiblesses décelées par notre liste de contrôle.

Introduction
When an individual is admitted to hospital, their ‘code status’ is routinely considered. Given the increasing degree of medical complexity of many patients, it is no longer safe to assume that patients want or would benefit from resuscitation in the event of cardiac or respiratory arrest. A 10-year longitudinal study found that survival to discharge after an in-hospital cardiac arrest was 5-20%.1 Even when patients survive, they are often left with secondary complications including depression, anxiety, cognitive deficits, and reduced quality of life.1

Furthermore, in-hospital resuscitation is no longer a black or white treatment plan; there are degrees of intervention that are possible depending on the patient’s condition and informed preferences for treatment. Thus, it is imperative that resuscitation is sensibly and accurately discussed with the patient and/or substitute decision maker (SDM) at the earliest possible time following admission. This conversation must be guided not only by patient values and goals of care, but also by evidence. When code status discussions (CSDs) are done well, these conversations provide patients with a powerful opportunity to express their values and participate in broader advanced care planning.2,3 When done poorly, patient-provider relationships can be damaged and patients are at risk of receiving unwanted or inappropriate interventions at the end of life.4

At many hospitals, CSDs are conducted by medical residents at the time of admission. Past studies have shown that residents report inadequate training in leading these conversations and often feel uncomfortable with this task.5,6 Residents leading CSDs often overestimate survival rates post-resuscitation, omit information about post-survival outcomes, and neglect to discuss patient values.6,7 As such, resident education on this topic is imperative.

Simulation is often used to help educate and evaluate residents on a variety of skills and procedures to further enhance a skill set without affecting patient care. Past literature has described a poor correlation between resident confidence or comfort with a skill and objective findings during simulation.1,4 However, studies have shown an improvement in resident skills after a combination of educational sessions and simulation.4,8 Barriers to this form of training include time required from residents and faculty, resource availability, and financial constraints.

Our objective was to develop a brief, cost-effective, simulation-based intervention in order to improve resident performance and comfort in leading CSDs. We piloted this project in the Internal Medicine Department, with the goal of developing an intervention that could be incorporated into any academic curriculum. We used realistic scenarios based on common hospital admissions seen in the Internal Medicine wards during our simulation.
Methods
First year Internal Medicine trainees (junior residents) at Western University in London, Ontario, Canada were invited to participate in our pilot study. This was conducted during a mandatory academic half-day session in order to maximize participation. Residents were provided with a letter of information and consent before participating. Participation in simulation was voluntary, and pre- and post-survey responses were anonymous. An identifier was used solely to match the survey responses to the individual for data accuracy. Second and third year trainees (senior residents) acted as standardized patients (SPs) and faculty members in Internal Medicine and Palliative Care were the session facilitators.

This intervention was conducted in September 2015, and consisted of three parts: a simulated CSD, an educational session, and a second simulated CSD (Figure 1). The CSDs used two standardized scenarios that were judged by faculty to be of equal difficulty. The first scenario involved an 86-year-old patient with a non-operable pubic ramus fracture, and the second scenario involved a 68-year-old patient on chronic dialysis presenting with pneumonia. Junior residents were evaluated by faculty using a standardized 15-item checklist utilized in previous literature by Szmulowicz et al.\(^4\) as well as the Canadian consensus guidelines for CSDs\(^8\) and Western University’s institutional guidelines.

The educational session was a one-hour large group discussion led by an Internal Medicine faculty facilitator. The session provided junior residents with an approach to leading CSDs based on previously developed guidelines. During this time, other faculty facilitators led small-group case-based discussions with senior residents regarding difficult CSD scenarios.

Junior residents completed pre- and post-surveys to determine their familiarity and comfort with leading and documenting CSDs. Qualitative feedback was gathered from junior residents, senior residents, and participating faculty.

Our primary outcome was the difference in score between the two simulated CSDs. Our secondary outcomes included the difference in resident comfort with leading and documenting CSDs based on a 5-point Likert scale. Our primary outcome was analyzed using a student’s paired t-test (GraphPad Prism, California, USA). Our secondary outcomes were analyzed using Wilcoxon signed rank test (GraphPad Prism, California, USA) as well as descriptive statistics.

Results
Baseline characteristics
Twenty-four junior residents participated in our study, of which 14 (58%) were male and 10 (42%) were female. The average age was 26.8 (+/- 2.1) years. Eleven (48%) of our participants reported having led at least 15 CSDs, while only three (12%) reported having led fewer than five CSDs.

Quantitative outcomes
Both resident checklist scores and self-reported comfort improved significantly after our intervention (Table 1). Change in individual checklist components can be seen below (Table 2). No change was seen in general communication skills such as establishing rapport and using non-technical language. The largest improvements were seen in explaining resuscitation as a package of interventions, discussing active treatments first, and making a recommendation. Verifying patient understanding and discussing alternatives to resuscitation are areas of weakness that will require more focus in future sessions.

Figure 1. Flowchart of educational intervention to improve resident CSD skills.
Table 1. Change in objective and subjective CSD skills after our intervention

<table>
<thead>
<tr>
<th></th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checklist Score, mean (SD)</td>
<td>8.8 (3.3)</td>
<td>11.1 (2.7)</td>
<td>0.012</td>
</tr>
<tr>
<td>Comfort with Discussion, mean (SD)</td>
<td>3.3 (0.9)</td>
<td>4.1 (0.7)</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Comfort with Documentation, mean (SD)</td>
<td>3.5 (1.3)</td>
<td>4.6 (0.6)</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

Table 2. Number of residents performing individual checklist components (n, % performed)

<table>
<thead>
<tr>
<th></th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishes rapport promptly</td>
<td>21 (88%)</td>
<td>21 (88%)</td>
</tr>
<tr>
<td>Describes purpose of conversation in first few minutes</td>
<td>20 (84%)</td>
<td>22 (92%)</td>
</tr>
<tr>
<td>Uses non-technical language</td>
<td>19 (79%)</td>
<td>20 (84%)</td>
</tr>
<tr>
<td>Asks patient about prior experience with end of life decision-making</td>
<td>15 (60%)</td>
<td>20 (84%)</td>
</tr>
<tr>
<td>Assesses patient understanding of current diagnosis and prognosis</td>
<td>13 (54%)</td>
<td>15 (63%)</td>
</tr>
<tr>
<td>Explores patient values and goals surrounding end of life care</td>
<td>15 (63%)</td>
<td>18 (75%)</td>
</tr>
<tr>
<td>Explains the concept of resuscitation as a “package” of interventions</td>
<td>10 (42%)</td>
<td>19 (79%)</td>
</tr>
<tr>
<td>Explains likely outcomes of resuscitation in this particular patient</td>
<td>13 (54%)</td>
<td>19 (79%)</td>
</tr>
<tr>
<td>Discusses alternatives to full resuscitation (i.e. comfort care, BiPAP)</td>
<td>11 (46%)</td>
<td>10 (42%)</td>
</tr>
<tr>
<td>Makes a recommendation based on patient values &amp; medical status</td>
<td>9 (38%)</td>
<td>18 (75%)</td>
</tr>
<tr>
<td>Frames recommendation with “active” treatments first</td>
<td>5 (21%)</td>
<td>13 (54%)</td>
</tr>
<tr>
<td>Distinguishes “Vital Signs Absent” and “Life Threatening Situation”</td>
<td>15 (63%)</td>
<td>22 (92%)</td>
</tr>
<tr>
<td>Comes to agreement with patient as to code status level</td>
<td>18 (75%)</td>
<td>17 (71%)</td>
</tr>
<tr>
<td>Verifies that patient understands what will occur in an emergency</td>
<td>15 (63%)</td>
<td>11 (46%)</td>
</tr>
<tr>
<td>Fills out LHSC End of Life (EOL) Form correctly</td>
<td>10 (42%)</td>
<td>15 (63%)</td>
</tr>
</tbody>
</table>

Qualitative Outcomes

Our educational session and simulations were well-received by all participants. Comments from junior residents included: “I will now explore patient values prior to discussing resuscitation options,” and “I feel more comfortable identifying when a resuscitation conversation is appropriate”. Senior residents found their experience as SPs to be valuable. Their comments included: “I realized that the wording you use can change people’s minds,” and “I will now be more aware of my use of medical lingo”. Faculty evaluators requested that this session be repeated at least on an annual basis, one commenting: “I was amazed at the difference that a little guidance and feedback could make”. Several junior residents commented that the time provided for simulation was too short, and that they would prefer specific time for feedback at the end of each simulation.

Conclusion

We developed a short, no-cost educational intervention that improved resident skills at leading CSDs. We piloted this program to a specific group during protected educational time in order to maximize attendance. This is a simple intervention that is easily repeatable, and can be implemented to trainees of different levels across different departments. Internal Medicine was initially selected as these residents most commonly admit patients to hospitals and are at the forefront of leading CSDs.55

Our study did have a number of limitations, including a pre-post design without a formal control group and lack of a validated checklist. The role of SPs was played by senior residents instead of trained actors, which may have limited the verisimilitude of our simulation. However, senior residents may have benefited from participating in this role in terms
of adjusting their own approach to CSDs in the future. Using senior residents as SPs also allowed us to produce a no-cost intervention. We also do not know whether the improvement in checklist scores will be sustainable over time and result in clinically significant outcomes.

One of our next steps is to have participants repeat CSD simulations within 12 months to evaluate if their skills are retained and to assess through qualitative means how this has been incorporated into clinical practice. Based on feedback from this pilot study, we will modify our educational intervention to provide an optimal learning opportunity for participants. Individual checklist components that represent areas of resident weakness, such as discussing alternatives to resuscitation, will be points of focus for the next educational session.

Ultimately, while simulation is a valuable tool to evaluate resident performance, we still do not know whether improvement in simulated CSDs will translate to improvement in CSDs with actual patients. Future research should include observation and evaluation of real patient encounters, including interviewing patients to evaluate their experience and understanding after CSDs.

References

Competing Interests: None to declare

Ethical Approval
This study was approved by the Western University Research Ethics Board (AE #104208).

Disclaimer
None

Previous Presentations
Part of this work was presented as a student poster at the American College of Physicians Ontario Chapter conference in November 2015 in Mississauga, Ontario.