A crucial component of a nurse anesthetist’s education involves working with patients in actual operating rooms under the tutelage of an anesthesia clinical instructor (CI). Problems arise when CIs are placed in situations for which they are ill prepared. Teaching occurs in settings where patient safety and quality must be ensured. Trigger films are 2- to 4-minute vignettes simulating real-life situations that finish abruptly, stimulating participants to analyze situations in a safe environment. This study’s purpose was to develop and assess the validity of high fidelity trigger films in facilitating nurse anesthesia clinical instructor development.

Trigger films were produced in our simulation laboratory involving: (1) the overly confident student, (2) the self-defeating student, and (3) teaching stressed by production pressure. Trigger films consisted of Part A, the introduction of a complex teaching situation, and Part B, offering 1 possible resolution. Trigger films attained validity using a national panel of experts ( > 0.88, all indices). Seventy-four clinical instructors viewed trigger films, completing an extensive evaluation. Scenario themes were consistently described; the depicted, desirable clinical instructor attributes were routinely identified by the participants.

This study initiated the process of demonstrating validity and reliability of trigger films in this setting. Trigger films may offer a systematic approach to facilitating clinical instructor development by safely engaging clinical instructors in a range of complex scenarios in the “living laboratory.” They may have application in other healthcare domains as well.

Key words: Anesthesia faculty development, clinical instruction, simulation, teaching methodologies, trigger films.

In 1982, Katz identified 22 “best” and “worst” CI characteristics as perceived by a national sampling of program directors, clinical instructors, and students. A follow-up study identified and ranked the importance of these characteristics as perceived by 354 anesthesia program directors, CIs, and students nationwide. It was noted that problems arise when CIs are placed in teaching roles for which they are ill prepared.

Teaching and learning traditionally take place as a result of 1 or more of the following approaches: lectures, demonstrations, experiential stories, student presentations, Socratic/discussion method, computer assisted instruction, readings, writing assignments, small group interactions, and “on the job” training. CIs are tasked with demonstrating or supervising hands-on experiences, supplementing the process with explanation or theory. What makes the responsibility particularly formidable is that the teaching occurs in a setting where patient safety and quality of care must be ensured, in an environment susceptible to a myriad of psychosocial factors. CIs develop keen observational and analytical abilities as a result of what they do everyday; as such they become a powerful asset for researchers in evaluating educational methodologies.

The trigger film (TF) is a 2- to 4-minute vignette displayed audiovisually, simulating a real-life situation that finishes abruptly, without committing to a particular course of action. TFs stimulate participants to analyze situations in a safe environment. A follow-up vignette may be included suggesting an approach based on current best evidence. TFs may be particularly effective in the analysis and remediation of clinical, interpersonal, and technical scenarios that surface in practice but are difficult or dangerous to reproduce in the real clinical situation.

Pioneered in the late 1960s, TFs have been used in
many fields to determine how professionals choose to act in various situations. Alroy and Ber used the TF technique with medical students. The researchers found the films to be successful in prompting discussions concerning various approaches in managing medical situations that students might encounter as practitioners. The students were able to draw from classroom theory/knowledge and their clinical experiences/observations to formulate a sound plan to resolve the situation.

In 1994, Nichols developed a TF centered on ethical issues in nursing, finding the TF to be an excellent stimulus for discussion, allowing the students an opportunity to explore issues they might otherwise not be afforded the opportunity to experience. It was found to be particularly effective in the analysis of dilemmas that arise in practice but proved difficult to simulate through the case study approach. Despite the availability of literature explaining the TF technique and research supporting its use, this method has not been demonstrated or reported in the domain of clinical anesthesia education.

Schon and Brookfield advanced the notion of the reflective practitioner, whereby the technical realities of teaching (the textbook, the classroom, the authoritative lecture) become clouded with the often confusing and stressful realities of real world practice. It may be that 1 phenomenon operative during the viewing of a TF is that participants are drawn into a virtual setting that enhances realism, introspection, active participation, and objective evaluation. The learning comes in the doing as described by Schon.

We wish to introduce the concept of the “living laboratory,” a modeled, virtual setting where activity, improvisation, success, and failure occur in the face of patient and provider interaction; where manipulation of 1 or more variables can occur under conditions approaching reality. Accordingly, intervention and outcome are highly contextual, amenable to the rich diversity of human and environmental inputs. As a kind of simulation, TFs seem ideal in the creation of the living laboratory.

Daily, CIs are faced with a wide variety of teaching challenges; the way the CI manages these situations has significant impact on a student's learning and subsequent teacher/learner interactions. Ideally one should learn how to effectively manage such situations a priori, in a safe and controlled classroom or simulated environment. The conundrum lies in how to effectively reproduce complex situations in such an atmosphere and still maintain realism, a challenge we believe may be addressable with the TF approach.

This study's purpose was to develop and assess the value of high fidelity TFs in facilitating CI professional development. Based on established conceptual models, the study developed 3 TFs, evaluating the effectiveness of this approach in presenting complex, dysfunctional, or otherwise challenging clinical teaching situations that CIs encounter everyday.

Methodology

Full approval for the investigation was received from the representative institutional review board. The 2 phases of this study included phase 1, development of the TFs, and phase 2, application of the TFs to the intended audience, the CIs.

- **Phase 1, development of the TFs.** Three TFs dealing with the following clinical situations: (1) the aggressive/overly confident student, (2) the timid/self-defeating student, and (3) the student/faculty relationship stressed by demanding production pressure, were produced. The TFs were based on actual occurrences from the authors' collective experiences.

Each TF consists of Part A, the introduction of a challenging or dysfunctional clinical teaching situation between CI and student. Part B offers 1 possible, best-evidence response. TFs were produced in our Center for Research in Human Simulation. This center affords us opportunities and freedoms to create virtual reality learning in a no-risk environment. The center houses a functional operating room with 3 full-body, computerized simulators demonstrating real mechanics and physiology—a virtual patient in a virtual operating room. The center is managed via an attached control/communications center with hidden observation components. During the actual filming, experienced department personnel assumed the required “actor” roles (surgeon, scrub technician, CI, student, etc). The institution's Media Production Department was contracted for consultation and film production.

The completed TFs were sent to 10 nationally prominent clinician-educators in diverse geographic locales to assess face and content validity regarding portrayal of the intended scenario and demonstration of effective CI attributes. The coefficients were computed demonstrating high rater agreement for the following phenomena: (1) perception of the nature of the challenging situation in the TF (coefficient = 0.95), and (2) the attributes of the CI depicted in the TF in resolving the challenge (coefficient = 0.88). The statistic, a measure of agreement that can be applied to different categories of assessment among raters, assessed the degree to which the intended attributes (those depicted in the TFs) were perceived by the raters. It allocates a score of zero if the agreement between raters is no better than would be expected by chance.
alone; perfect agreement gives a score of 1.0. Based on the high scores, and the overall excellent rating of the videotapes by the expert panel, reediting, though anticipated, was unnecessary. Evaluators were not asked to judge whether or not part B of each TF was the best approach to managing the scenario, but only to judge what attributes were displayed by the CI in resolving the scenario.

• Phase 2, Application of the TFs to the intended audience, the CIs. CIs (n = 96) from diverse settings in New York, North Carolina, and Virginia were exposed to 3 different TFs in the following manner. Part A, lasting approximately 2 to 3 minutes in duration and demonstrating a challenging situation, was viewed. At this point the CIs completed a questionnaire assessing their impressions of the TF in terms of: (1) what was the nature of the depicted scenario, (2) what suggestions, if any, do you have for improving the depicted scenario? Then Part B was viewed, also approximately 2 to 3 minutes in duration, demonstrating 1 possible, best-evidence response by the CI. The CIs then completed a second questionnaire: (1) what attributes were depicted by the CIs (selecting from a list of 17, Table), (2) of the 17 listed attributes, what 3 were the most important attributes, and (3) are there other attributes that contribute to being an effective CI (beyond what was noted in the 17 listed)?

The questionnaires had high reliability and validity during the “expert” assessment phase of the study and were designed to explore the participant’s perception of: (1) the type of student represented; (2) the theme of the scenario, (3) a rating of demonstrated CI attributes in the follow-up, Part B; (4) a request to rank the 3 most valuable attributes in the context of the particular scenario; and (5) to critique how the TF might be improved upon.

This study involved making assessments of learning transference to the affective domain. We acknowledge that there is great imprecision of existing metrics in measuring complex performance in this arena. Assessing the impact of novel training for labyrinthine, real-world job skills in general, and those rooted in the affective domain in particular, is difficult.

While the study was fundamentally descriptive in nature, the open-ended questions were amenable to a content analysis, providing us with the opportunity to

Table. List of displayed clinical instructor attributes*

<table>
<thead>
<tr>
<th>Clearly demonstrated</th>
<th>Weakly demonstrated</th>
<th>Not demonstrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Clinical competence/judgment</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>2. Calmness</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>3. Communication skills</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>4. Sensitivity</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>5. Empathy/respect</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>6. Timely feedback</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>7. Stimulates effective discussion</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>8. Flexibility</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>9. Open mindedness</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>10. Positive role model</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>11. Open minded</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>12. Engenders confidence</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>13. Scholarly teaching/knowledge</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

* Adapted from Katz LE and Hartland W. The 22 attributes defined in these sources were condensed to 17 based on an expert panel’s decision to taxonomize attributes because the attributes are all inclusive but individually exclusive in nature.
transform the responses into codified types or themes of responses from the participants. As such, the content analysis of the participants’ beliefs and perceptions allowed us to develop descriptive and explanatory assertions. The approach is well established in the literature and is familiar to the researchers; the method described by Fox was precisely followed.11

**Results**

A total of 96 CIs from 4 discrete settings in New York, North Carolina, and Virginia viewed and evaluated the TFs. TF number 1, depicting the unsure, timid student feeling overwhelmed by the unfolding clinical situation was described as such by 100% of the evaluating CIs. Major recommended changes or improvements (noted at least once in the evaluations) included: having the student cry in Part A of the TF, lowering the expectations of the CI in Part A, and having the CI remove the student from patient care in Part B. The attributes identified most often (at least by 75% of respondents) on the part of the CI depicted in the TF were: clinical competence/judgment, being calm, motivating the student, being empathetic, stimulating effective discussion, flexibility, positive role model, enjoying teaching, engendering confidence, being open minded, having good communication skills, and being a knowledgeable teacher. The CI attributes ranked as “most important” by at least 50% of the respondents were: motivating the student, being calm, demonstrating sensitivity/empathy, and being a good evaluator/counselor. In terms of how the TF could have been improved, only 3 responses were elicited, including: provide more positive feedback, be a more active teacher, and be more complimentary.

TF number 2 depicted a scenario where production pressure challenged teaching (an impatient surgeon during the teaching of laryngoscopy to a new student), and 100% of the observing CIs identified the scenario as above. Recommendations for “improving” the scenario suggested: asking the surgeon to leave the room or have more patience, put the drapes up to shield what is going on, and having the student be more decisive. The attributes identified most often (at least by 75% of the respondents) on the part of the CI depicted in the TF were: clinical judgment, calmness, flexibility, ego strength, good communication skills, positive role model, motivating the student, being open minded, and engendering confidence. The CI attributes ranked as “most important” by at least 50% of the respondents were: calmness, positive role model, and engendering confidence. In terms of how the TF could have been improved, only 2 responses were elicited: show how the CI can get the surgeon out of the setting and being a more active teacher.

TF number 3 depicted the aggressive, overly confident, insubordinate student (a CI relieving another CI of oversight responsibility, the student proves challenging and insubordinate to the relieving CI). All of the observing CIs identified the scenario as above. Recommendations for improving the scenario included: dismissing the student immediately from the case, verbally assaulting the student in front of those in the operating room, and calling the relieved CI back to the room. The attributes identified most often (at least by 75% of respondents) on the part of the CI depicted in the TF were: competence/judgment, calmness, communication skills, timely feedback, ego strength, positive role model, enjoys teaching, scholarly teaching/competence, and stimulating effective discussion. The CI attributes ranked as “most important” by at least 50% of the respondents were: calmness, ego strength, competence/judgment, and communication skills. In terms of how the TF could have been improved, only the issue of the CI being portrayed as “perhaps being too understanding” of the student was expressed.

**Discussion**

Abundant research has been reported in the literature concerning clinical teaching effectiveness in the professions of medicine, dentistry, nursing, and allied health. The future of any profession relies on the quality of education of their learners. A major portion of the nurse anesthesia student’s educational experience is conducted in the clinical arena under the tutelage and mentorship of nurse anesthetist CIs. It is critical that these instructors are able to effectively engage in this process with manifest skill and mastery not only of the knowledge base that underscores clinical practice but also with similar skill in the art and science of teaching. Unfortunately, many CIs are ill prepared, through no fault of their own, for the challenges and responsibility inherent in the process.

This study demonstrated the ability to uniformly display a range of complicated, challenging scenarios in a living laboratory setting. Furthermore it corroborated the work of previous investigators who examined and ranked the importance of attributes of effective clinical instruction.1,2 We believe that this work helps to broaden our belief that nurse anesthesia CIs do not report enough about their own work with patients, nor are they queried enough about that work. In this process, the profession distances itself from a major resource, the observational and critical assessment skills of these CIs refined by their roles as simultaneous clinician/teacher.
Many years ago, one of us (CB) came across a bit of wisdom, credited to an unknown author:

> The practice of anesthesia calls for two virtues and four abilities. The virtues are compassion toward patients and respect for coworkers; the abilities are comprehension of many facts, grasp of complex concepts, manual dexterity, and quick responses. The virtues grow with maturity, but we must endlessly exert ourselves to acquire, maintain, and improve our abilities.

The CI is tasked with possessing virtues and abilities beyond even these fundamental, yet formidable attributes (see Table). Additionally, the CI is taxed with the imposing responsibility of determining the appropriate balance (often under exceptional conditions) between fostering educational objectives—on the part of the student—and ensuring quality and safe care of the patient.

The intent of this study was to examine the utility of the TF as a methodology fostering CI professional development. Driving the study was the nebulous concept of professional competence. We embrace a definition of competence grounded in previous work. Namely, professional competence is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individuals, organization, and community being served. This definition treats patient, teacher, learner, institution, and profession as a highly integrated, complex system.

This study initiated the process of demonstrating validity and reliability of the TF approach in clinical anesthesia education. We fully embrace the view noted in a recent Agency for Health Care Quality Report:12

> Definitive experiments to improve our understanding of simulator effects on training will allow them to be used more intelligently to improve provider performance, reduce errors and ultimately, promote patient safety. Although such experiments will be difficult and costly, they may be justified to determine how this technology can best be applied.

We believe that use of the TF can provide a systematic approach to improving the nature and quality of clinical instruction. The operating room is an emotionally, technically, and cognitively stressful environment with its own cultural pluralities where the quality of decision-making is critical. While obvious in academic centers, teaching occurs in nonacademic facilities as well, often from senior to junior colleague (or vice versa), or down, up, or across the medical/nursing/technician organizational structure. Regardless of the type and size of the facility, clinical instruction requires skilled and knowledgeable teachers who can adapt their teaching methods to the realities of caring for real people in real surgical situations. This study suggests that TFs may help anesthesia CIs hone the necessary abilities needed to teach effectively in such a high-stress environment.

A renewed emphasis on reducing errors in healthcare13 leads us to suggest that TFs may provide an as yet underappreciated but effective method for teaching healthcare providers. TFs can be used to demonstrate techniques, to teach alternative approaches to dealing with “real-life” clinical problems, to provide remedial instruction, to learn new technologies, and to improve the teaching dynamic between instructors and students. The effective use of TFs can help providers improve both the quality and safety of the care interventions they provide. TFs can be a powerful tool by which health professionals learn complex or critical tasks inherent in their jobs. Additional research into other thematic clinical vignettes is needed, as well as studies that further assess the efficacy and usefulness of the TF methodology. Follow-up studies are currently underway to measure specific outcomes related to TF technology.

REFERENCES


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