

THE PULSES PROJECT

THE PULSES PROJECT: TEACHING THE VITALS ELEMENTS OF CODE
STATUS DISCUSSIONS TO POSTGRADUATE ONCOLOGY TRAINEES

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A Thesis Submitted to the School of Graduate Studies in Fulfilment of the Requirements
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Lay Abstract

Medical learners in oncology (cancer care) training programs often lead discussions with cancer patients about code status, that is, patients' wishes for use or non-use of life-sustaining resuscitation interventions including CPR. Learners receive little training for these complex encounters; yet, decisions regarding resuscitation wishes can influence the quality of care received by cancer patients at end of life. In this study we conducted a survey of trainees and program directors in Canada to better understand current educational practices and attitudes towards education on this topic. Most trainees are not receiving formal teaching or evaluation, and new educational resources are needed. We then developed a 6-step communication guide for code status discussions. We studied the effect of a training workshop in which the communication guide was taught to learners in oncology. We found that the training program improved communication ability among learners with the greatest impact seen among junior learners.

Abstract

Purpose

This work addresses teaching communication skills for eliciting cardiopulmonary resuscitation (CPR) wishes, or code status discussions, with cancer patients. The objectives of this thesis include: 1) define current teaching practices for code status communication training in Canadian oncology residency programs, and 2) examine the effect of teaching a novel communication framework for code status discussions to oncology residents.

Methods

All current residents and program directors in Canadian medical and radiation oncology residency programs were surveyed regarding education, perceived gaps in training, attitudes towards and patterns of clinical practice for code status discussions with cancer patients. We carried out a multicentre randomized trial to determine the effect of teaching a code status communication framework to oncology learners. Residents completed a training workshop and were evaluated in simulated patient encounters (observed structured clinical exam [OSCE]). Participants were randomized to complete the training before the OSCE (experimental arm), or after the OSCE (control arm). The primary outcome was objective rating of code status communication skills.

Results

Current postgraduate oncology curricula lack formal teaching and evaluation of code status communication skills. Educators support the need for innovative teaching tools in this field. Accordingly, a novel six-step communication framework was created in which core themes were

summarized by the mnemonic acronym PULSES (Prognosis, Underlying values, Long-term outcome and Short-term outcome of CPR, provision of an Educated recommendation, Summary, style and documentation). A total of 46 oncology residents from 3 training centres participated in the randomized trial. Overall, learners in the experimental group had higher mean content-specific, general communication, and global rating communication scores than those in the control group. The training program conferred the greatest benefit among junior residents. Scores across rating tools were highly correlated.

Conclusions

Communication training for code status discussions in Canadian oncology residency programs is lacking. With use of a novel communication framework, we have shown that structured teaching on code status discussions can improve competence in this challenging communication task. Moreover, we have developed educational resources that can be implemented in current curricula. Building capacity for clear and effective code status communication with cancer patients will contribute to high quality end of life care in Canada.

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List of abbreviations

EOL	End of life
CPR	Cardiopulmonary resuscitation
DNR	Do not resuscitate
AND	Allow natural death
ER	Emergency room
ICU	Intensive care unit
ACP	Advanced care planning
ASCO	American Society of Clinical Oncology
PD	Program director
PGY	Postgraduate year
CaRMS	Canadian residency matching service
OSCE	Observed structured clinical encounter
ITER	In-training evaluation report
GRS	Global rating scale
SP	Standardized patient
CSAF	Clinical skills assessment form

Declaration of Academic Achievement

Oren Levine contributed to this work with respect to conceptualization, research design, project execution, data collection, analysis and preparation of this manuscript. Drs. Melissa Brouwers, Sukhbinder Dhesy-Thind and Meghan McConnell each contributed to all aspects of this work in a supportive and advisory capacity.

Chapter 1 - Introduction

1.1 Background

1.1.1 Statement of problem

Despite therapeutic advances, cancer remains a terminal illness for many patients. Thus, quality end of life (EOL) care is an essential component of the cancer care continuum. Oncologists participate in EOL care and must be proficient in communicating around related topics including wishes for life-sustaining invasive interventions such as cardiopulmonary resuscitation (CPR), also known as ‘code status.’ This can be a difficult topic for a healthcare provider to discuss with a patient and family members in the context of terminal illness. Decisions for use or non-use of life-sustaining treatments near EOL are influenced by personal morals and values, and the decision-making process can be emotionally charged. Building proficiency among junior clinicians for leading code status conversations is the focus of this work.

1.1.2 Definition of code status

In the event of cardiopulmonary arrest, resuscitation measures may be undertaken with the goal of restoring spontaneous circulation, thus prolonging life. Interventions may include manual chest compressions, cardiac defibrillation, endotracheal intubation, artificial ventilation and use of inotropic medications. It is common practice to elicit a patient’s preferences for use or non-use of resuscitation measures during hospitalization, or in anticipation of deterioration in health. Currently, the default for care in the hospital setting is to administer all life-sustaining interventions unless a patient or substitute

decision maker has expressed an alternative preference. A directive for care that does not include resuscitation can be called a ‘do not resuscitate’ (DNR), or ‘allow natural death’ (AND) order.

1.1.3 End of life care for cancer patients in Canada

Almost two-thirds of deaths in Canada occur in hospitals, and as a result, much EOL care is delivered in the acute-care setting.(1) Cancer patients dying in Canada often receive care in hospital at EOL. For patients over 65 years of age dying with cancer, rate of death in hospital and mean per capita hospital expenditures in the final 6-months of life were highest in Canada compared to 6 other western nations (including the United States).(2) Patterns of care for oncology patients in Ontario highlight the relevance of EOL care in the hospital setting. Between 2002-2005, nearly 200,000 visits were made to the emergency room (ER) by cancer patients in the final 6 months of life and most patients made more than 1 visit. Over 36,000 visits occurred in the final 2 weeks of life. Of patients visiting the ER in the final 2 weeks of life, 77.2% died in an acute care bed and 5.2% died in the ER.(3) Accordingly, healthcare practitioners (including oncologists) in the acute care setting must have skills for communication about code status and other EOL care topics with terminally-ill cancer patients.

1.1.4 Advanced care planning and quality of end of life care

Hospitalization, intensive care unit (ICU) admission and frequent ER visits close to death are widely recognized as indicators of poor quality EOL care.(4) Aggressive care at EOL is associated with negative experience for cancer patients (lower satisfaction) and family members (increased anxiety and depression).(5) Advanced care planning (ACP), or establishing directives for care in the event of deterioration in health, has been associated with improved patient and family experience at EOL and improved quality care measures.(6, 7) Moreover, excellent communication from healthcare providers

has been associated with multiple benefits for patients including emotional and psychological wellbeing and enhanced satisfaction. The Institute of Medicine emphasizes effective communication and shared decision-making as critical components in achieving high quality EOL care.(8) In the context of incurable cancer, goals of care discussions should be initiated early in the disease trajectory.(9) Yet, for a well-patient, conversations about anticipating and planning for deterioration in health can be ineffective.(10, 11) ACP discussions must be revisited throughout the illness trajectory. Thus, if a patient presents to hospital with a deterioration in his or her condition, healthcare providers in the acute-care setting must have skill and confidence to revisit the concept of goals of care.(12)

ACP including decision tools for resuscitation wishes has been extensively studied, although interventions have focused on the ambulatory care setting, before a deterioration in health has occurred. A recent systematic review of studies involving ACP interventions, shows that use of structured communication tools improves frequency of ACP communication, completion of ACP directives, concordance between stated wishes and subsequent medical directives for life-sustaining interventions, and concordance between desired care and care received at EOL.(13)

1.1.5 Barriers to code status communication

Discussions on code status, one component of ACP, may determine the aggressiveness of care received by patients at EOL. There are many barriers which interfere with code status decision making.

Misperception exists among patients regarding effectiveness of CPR. This may be related to portrayal of CPR in lay media as a procedure which most often restores normal health.(14) A Canadian study found that only 2.7% of elderly hospitalized patients with terminal illness believe that the chance of surviving CPR is less than 10%.(15) In the advanced cancer population, the chance of leaving hospital after resuscitation is estimated to be 5.6% based on a meta-analysis of cohort studies; yet, this pooled result

may be influenced by selection bias.(16) For seriously-ill patients with advanced cancer, it is likely that CPR is attempted more often for relatively ‘healthier’ patients leading to a possible overestimation of favourable outcomes from CPR in the broader population of patients with incurable cancers.

Understanding of prognosis influences patient preference for resuscitation. If patients perceive poor prognosis (expected survival <2 months) they are more likely to discuss advanced directives and less likely to desire CPR.(17) Yet, patient misperception of prognosis and intent of treatment is pervasive. Surveys have shown that 69% of metastatic lung cancer patients and 81% of metastatic colon cancer patients (incurable diseases in most cases) believe that chemotherapy may be curative.(18)

Misunderstanding of prognosis presents another barrier to code status decision making.

In academic centres, such critical conversations are often lead by residents at the time of hospitalization and in times of crisis. These residents typically have not had prior interactions with the patient.

Moreover, there may be a lack of documentation or understanding of previous discussions with physicians in the outpatient setting. Literature indicates that residents often feel unprepared to lead code status discussions and when such discussions occur, essential information may not be conveyed to the patient.(19-21) This can lead to discordance between a patient’s true preferences regarding code status and documentation in the medical record.(22) Providing residents with proper training for leading a code status discussion is vital for overall patient care.

1.1.6 Development of the PULSES framework – a novel communication guide for code status discussion in oncology

We previously developed the PULSES framework, a six-step approach for code status conversation to help oncology learners build skill and confidence for this communication task. We followed a rigorous process of item generation, content validation, assessment of content coverage and face validity. We

incorporated literature review and a 2-stage multidisciplinary expert panel consultation including a variety of clinicians and non-clinicians. Development of the communication framework has been prepared for publication separately (please note that this content overlaps with a term paper submitted in fulfilment of HRM 727 course requirements), but for clarity, a brief overview is included in Appendix A. The proposed PULSES framework includes 6 thematic domains shown in Table 1.

Table 1 - PULSES: A communication framework with 6 domains for code status discussions

P	Prognosis
U	Underlying values
L	Long-term outcomes of resuscitation
S	Short-term outcomes of resuscitation
E	Educated recommendation
S	Summary, style and documentation

1.2 Rationale

No single approach to code status communication exists, yet consistent themes emerge from published literature regarding necessary elements for such encounters. For example, a Canadian consensus statement generated through a multidisciplinary Delphi process lists essential communication tasks including exploration of values, defining CPR, distinguishing CPR from other life-sustaining therapies, review of options for care other than CPR, discussion of care and morbidity risk following CPR, estimation of prognosis, and provision of a medical recommendation regarding use or non-use of CPR.(23) The importance of prognostication and provision of a medical recommendation are echoed by other authors.(24, 25) Medical education literature refines key objectives including exploration of a patient’s goals, estimation of likelihood that resuscitation can contributed to achieving stated goals and provision of a medical recommendation framed by the patient’s stated values.(20, 26, 27)

Code status decisions are influenced by overall ‘goals of care’ conversations in the face of serious illness, and there is overlap in content required for these related, but distinct clinical encounters. Best practices for serious illness-related goals of care conversations have been defined with essential components including: exploration of prognosis, eliciting fears and goals, exploring personal values regarding trade-offs between prolonged survival and impaired function, and wishes for family involvement.(9)

In addition to content, key communication behaviours for code status discussion have been defined. A clinician should aim to build rapport early in the interaction and to show empathy. Information should be shared in compartmentalized chunks to avoid overwhelming the patient and to allow verification of understanding.(28) Clinicians should avoid medical jargon.(29) Patients should have ample opportunity to speak and ask questions. Stopping to listen, allowing silence and incorporating periodic pauses can facilitate two-way communication.(30, 31)

Published communication tools are not comprehensive of all these aspects of code status discussion and no tool has been tailored for use with patients suffering from advanced cancer. The PULSES framework was developed to fill this gap. Employing a communication framework designed for this clinical context may be useful for ensuring a comprehensive and compassionate discussion and a patient-centred decision. Moreover, a stepwise approach may help trainees to build competence in this communication skill.

A recent consensus clinical practice guideline on patient-clinician communication from the American Society of Clinical Oncology (ASCO) encourages structured communication training and use of communication frameworks to optimize patient-doctor interactions in cancer care.(32) Structured teaching on communication skills for code status discussion is limited in Canadian Oncology training programs. Complicating the matter, there is limited literature regarding teaching methods in this area

for oncology trainees. Furthermore, code status discussions with cancer patients are predicated on prognosis. One must consider disease-related and patient-related factors such as tumor type, stage of disease, anticipated cancer-specific survival, performance status of the patient, and availability of effective and tolerable treatment options. Since the conversations with cancer patients can be complex and nuanced, the skills required by the oncology trainee to address code status differ from other medical learners. The few validated resources that are available tend to encompass general communication skills for conveying bad news or transitioning to palliative care – not specifically code status decision-making.(29) Communication tools and models more often are validated for use in the ambulatory care setting rather than the hospital ward or emergency department.(33) While there is evidence that a multi-day residential retreat is effective for teaching EOL communication skills to oncology fellows, this type of resource is not widely available to all oncology trainees.(34) Workshops and seminars of shorter duration have shown success for enhancing the EOL communication skills of early-year internal medicine residents;(35, 36) however, such programs have not been explored within oncology. Thus, there is a knowledge gap in available evidence regarding optimal and easily disseminated teaching methods to help oncology trainees to become proficient in communicating around code status.

1.3 Objectives statements:

In this project, the overall objective is to evaluate a novel communication framework (PULSES) to help postgraduate trainees build skills for code status discussions in oncology. Our goals were to demonstrate that skills in this area can be taught and measured through simulation-based learning and that an educational communication resource can be incorporated into competency-based postgraduate curricula in the field of oncology. The study was executed in 2 parts with the following specific objectives:

Part 1- Current code status communication training in Canadian postgraduate oncology programs

1. To define current teaching and evaluation practices in Canadian medical and radiation oncology residency programs regarding code status communication training
2. To identify gaps in training for code status communication as perceived by residents and program directors

Part 2- Evaluation of the PULSES framework

1. To explore impact of communication training using the PULSES approach on the clinical skills of oncology residents through simulated patient encounter learning strategies
2. To explore participants' satisfaction with teaching format and change in self-efficacy regarding code status communication

Chapter 2 - Code Status Communication Training in Canadian Postgraduate

Oncology Programs: an environmental scan

2.1 Background

While code status conversations are frequently the responsibility of, and are led by, residents at the time of patient hospitalization,(37) residents often feel unprepared to lead such discussions pertaining to EOL care.(19, 38) Residents may follow a depersonalized, formulaic approach to elicit a patient's preferences regarding CPR,(39) they often fail to provide necessary information such as likely outcomes of CPR, and tend not to give a medical recommendation.(21) As a result of poor quality of code status communication, patients and providers may not share the same understanding of a decision for or against life sustaining interventions.(27) Indeed, a survey of matched patient-resident physician pairs following hospital admission encounters showed poor correlation between each participant's recollection of whether code status was discussed and what components of the discussion occurred.(21)

Formal and informal training can improve the quality of code status conversations led by residents. Supervision and feedback increase the rate at which residents include key content such as exploration of patient values in EOL care decision making.(37) Communication training retreats and workshops have yielded improvements in quality of communication in simulated patient encounters among residents.(26, 34, 35) Existing education resources are generally complex, multifaceted experiential training programs limiting dissemination of successful interventions. As a result, structured teaching on communication skills for code status discussion is not standardized in Canadian oncology training programs. While some oncology residents may have received previous training on code status discussions before entering an oncology training program, conversations with cancer patients are

influenced by understanding of prognosis and treatment options and require enhanced communication skills.

To inform the development of new educational resources on this topic, an environmental scan of current training activities for this communication competency was necessary. The objective of this study was to define current teaching practices and the perceived need for new educational resources relating to code status discussions among Canadian oncology residency program directors (PDs) and trainees.

2.2. Methods

2.2.1 Study design and population

This cross-sectional study involved a survey distributed to all current residents and PDs in medical oncology and radiation oncology training programs in Canada. Medical oncology residency is a 2-year training which commences in the 4th postgraduate year, after the completion of 3 years of internal medicine training and 3 to 4 years of undergraduate medical education. Radiation oncology is a 5-year, direct-entry residency program after medical school. There are 15 and 13 accredited medical and radiation oncology residency programs, respectively, in Canada and an estimated 162 residents in training at the time of survey distribution. This study received approval after full review by the Hamilton Integrated Research Ethics Board (HiREB) affiliated with McMaster University (Project #2376).

2.2.2 Questionnaire development

Two surveys were developed and piloted at McMaster University: one targeted to PDs and the other developed for trainees. Survey content was developed to capture current educational activities and

perceived gaps in residency training pertaining to code status communication, attitudes towards this communication skill, and barriers to education on this topic. We also aimed to capture current patterns of practice with respect to code status discussions to identify whether real-world clinical encounters may serve as learning opportunities. The survey balanced goals of content coverage with efficiency to optimize response rates. Survey structure and content is summarized below. Unless specified, response options were categorical with the opportunity to add comments.

Content for PDs included

- Single question on demographics (oncology discipline)
- 7 questions on current teaching and evaluation practices addressing occurrence of formal and informal teaching (in what formats?), teaching hours committed, occurrence of evaluation of this skill, mechanisms to identify weak learners and to provide remediation
- 2 questions on perceived importance of this competency (in training and in practice), with responses measured on 7-point Likert scale with adjectival anchors
- 3 questions on gaps in current training programs addressing barriers to education on code status communication, perceived need for new teaching resources and what tools could enhance current education

Content for trainees included

- 2 questions on demographic details (discipline in oncology and year of training)
- 4 questions on expectation of current training program with respect to code status communication: expectation of formal training (and in what format), expected educational hours committed to this topic, expectation of evaluation

- 7 questions on current patterns of practice regarding code status discussions with cancer patients (frequency, location and circumstance in which discussions occur, perceived impact on care, frequency of agreeing with a patient’s decision, frequency of providing a medical recommendation and barriers to doing so)
- 1 question on current level of confidence in this area measured on 7-point Likert scale with adjectival anchors
- 2 questions on level of satisfaction with current education on this topic measured on 7-point Likert scale with adjectival anchors
- 2 questions on perceived importance of this competency (in training and in practice), with responses measured on 7-point Likert scale with adjectival anchors
- 1 question on barriers to education on this topic

To assess content and face validity, questionnaires were piloted with trainees, former PDs and faculty educators in medical and radiation oncology at McMaster University. Fellows (recent graduates from residency training) and graduating residents were asked to complete the surveys to limit overlap between the pilot group and the final study population. To capture perspectives of junior trainees, it was necessary to pilot the survey with a small group of learners who were ultimately included in the final study population. Questionnaires were modified based on feedback. Examples are listed:

- One question was added for PDs asking whether mechanisms exist to identify learners with weakness in this area
- No questions were eliminated, but modifications and clarifications were made:
 - The concept of ‘barriers to communication with patients’ was broadened to include interaction with family members as well
 - Clarity of language and formatting was improved based on feedback

Of note, trainees felt that response options were adequate to reflect their clinical experiences. The final version of each survey tool is included in Appendix B.

2.2.3 Data collection

Questionnaires were distributed between November 2016 and January 2017 and recipients had 30 days to submit responses. All responses were collected confidentially. 27 PDs, (13 medical oncology and 14 radiation oncology – one PD was not contacted due to a transition of leadership coinciding with the study) received surveys electronically using Lime Survey software. Residents from 6 training programs in Ontario received paper-based surveys while participating in an educational workshop unrelated to this study. The remaining residents received the survey electronically. Invitation emails were distributed through program administrators for all Canadian oncology training programs. Additionally, administrators were asked to send a reminder email toward the end of the response period. To protect privacy, study personnel were not provided with trainees' contact information. Accordingly, the total study population is estimated from the Canadian Residency Matching Service (CaRMS) recent match results indicating the number of residents entering postgraduate training programs in Canada each year.(40, 41) An estimated 162 residents received surveys. A five-dollar coffee card was offered to residents as a token incentive to encourage participation.

2.2.4 Analysis

Relative frequencies of categorical and ordinal responses were calculated. Descriptive statistics were generated with Microsoft Excel software. The Chi Square test was used to examine difference in proportions using SPSS software; in the event of low expected cell count in a contingency table, the Fisher's Exact test was used.

2.3 Results

2.3.1 Response rate and demographic characteristics

112 survey responses were collected, 17 from PDs (63.0% response rate) and 95 from residents (58.6% response rate). Response rates were similar across oncology discipline and trainees from all postgraduate years were well represented. (Table 2)

Table 2 - Characteristics of respondents

Responses (No., %)	Total Population	Medical Oncology*	Radiation Oncology
Program directors	17 (63.0)	9 (60.0)	8 (66.7)
Residents	95 (58.6)	37 (59.7)	58 (58.0)
PGY1**	11	--	11
PGY2	15	--	15
PGY3	9	--	9
PGY4	34	19	15
PGY5	26	18	8

*Training in medical oncology starts in the 4th postgraduate year; **PGY (postgraduate year)

2.3.2 Environmental scan of current educational practices

Only 54.1% and 48.3% of medical oncology and radiation oncology residents, respectively, reported any form of code status communication training before entering an oncology program. 43.2% of medical oncology residents and 48.3% of radiation oncology residents reported perceiving an expectation of competence in this communication skill before starting oncology training. More medical oncology PDs reported expecting trainees to be competent in this area before program entry compared to PDs from radiation oncology, although this difference was not statistically significant (56.0% vs 37.5%, $p = 0.637$).

Regarding current educational practices, 47.1% of PDs report that formal training on code status was provided to oncology residents and 41.1% of trainees expected this type of education to be offered.

(Figure 1) Over one quarter of trainees were not sure if their programs provided this training. Formal training was expected more commonly among medical oncology residents compared to radiation oncology residents (54.1% vs 32.8%, $p=0.01$). Educational formats most commonly identified included structured academic sessions (didactic or case-based teaching) and mandatory observation and feedback in the ambulatory care setting. Informal training on this topic was reported more commonly with most (82.3%) PDs endorsing current teaching through non-mandated observation and feedback in a variety of patient-care settings.

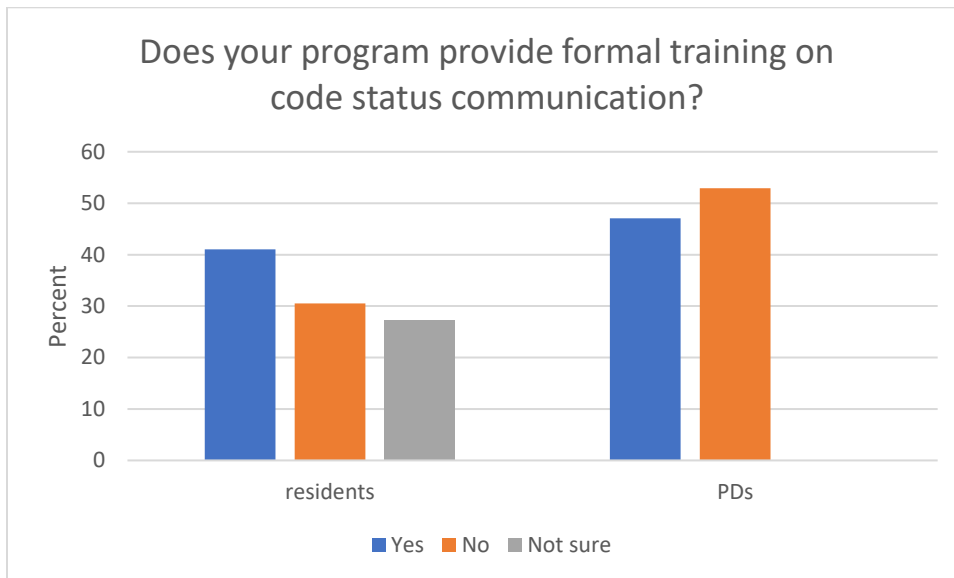


Figure 1 - Formal teaching on code status communication skills according to program directors (PDs) and residents in oncology training programs currently

When asked about formal evaluation of code status communication, only 41.2% of PDs and 20% of residents reported that evaluation of this skill is currently provided to trainees. Identified methods of evaluation were observed structured clinical encounters (OSCE), or in-training evaluation reports (ITERS). (Figure 2) Few PDs reported mechanisms in place to identify weakness in this competency among learners (29.4%), or offering remediation for trainees not meeting expectations in this area (35.3%).

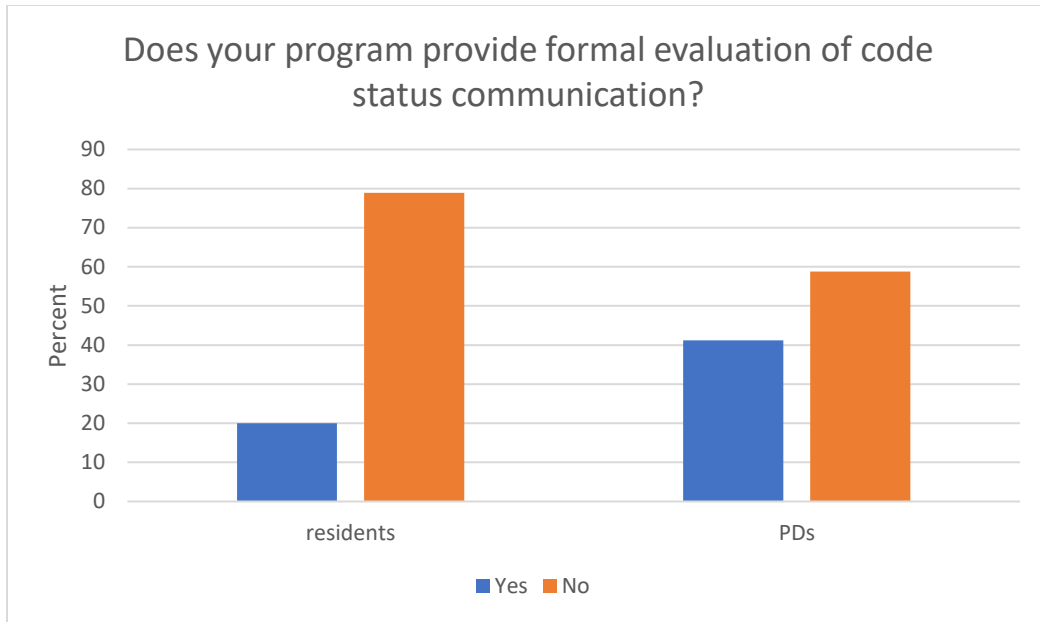


Figure 2 - Formal evaluation of competence in code status communication skills according to program directors and residents in oncology training programs currently

2.3.3 Perceived importance of code status communication skills

All PDs positively endorsed the importance of this competency both in residency and in clinical practice with most participants (70.6%) “strongly agreeing” with its importance in both contexts. Similarly, amongst residents, 97.9% and 98.9% positively endorsed the importance of this competency in residency and in clinical practice, respectively.

2.3.4 Satisfaction among trainees with current teaching

Only 36.8% of residents indicated satisfaction with current training on the topic of code status discussions. Moreover, 85.2% of residents agreed that additional training would be of benefit (somewhat agree, agree or strongly agree). (Figure 3)

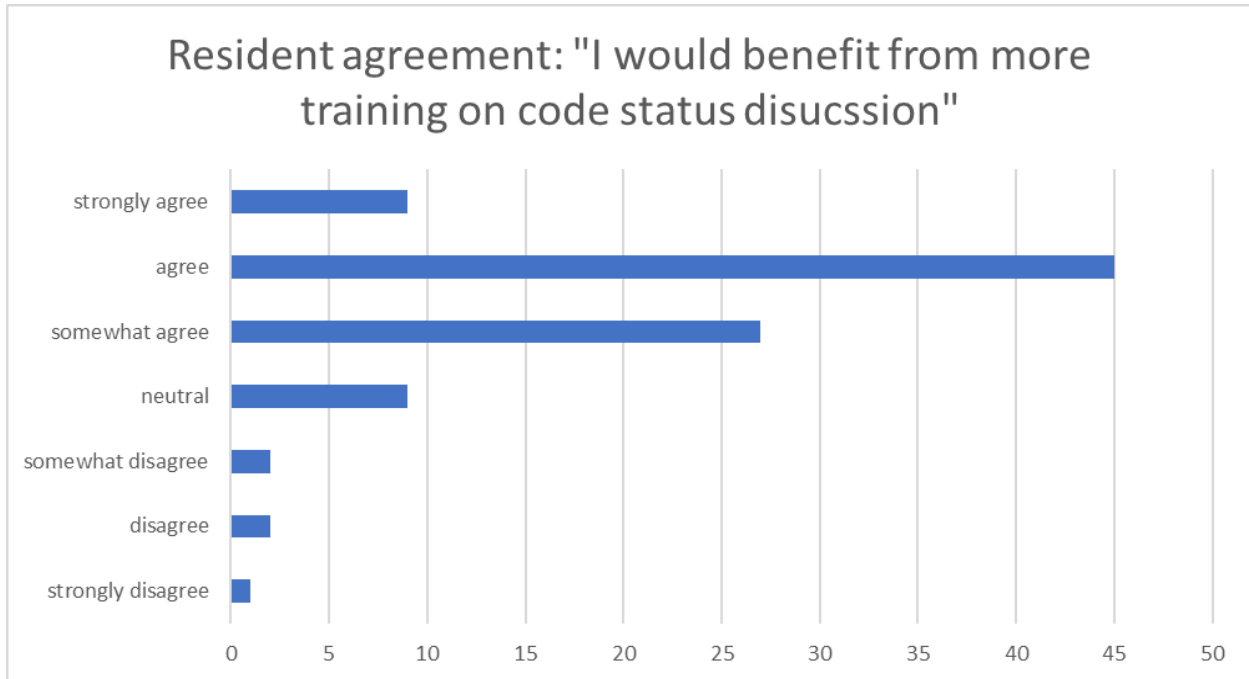


Figure 3 - Perceived benefit among trainees from additional communication training for code status discussions in oncology

2.3.5 Barriers to teaching

Respondents were asked to report perceived barriers to teaching on this topic. The most commonly identified barriers among PDs and residents included lack of time, lack of teaching and evaluation resources, and lack of interest among staff preceptors to offer training in this area. Trainees commonly identified the expectation of competence before program entry as a barrier to education. (Table 3) The majority of PDs (82.3%) endorsed the need for new teaching tools. New resources of greatest interest to PDs included an electronic module, a validated communication framework, and a workshop curriculum.

Table 3 - Barriers to teaching communication skills for code status discussions in oncology

Barrier identified (%)	Program directors	Residents
Lack of time	29.4	38.9
Lack of teaching resources	64.7	52.6
Lack of evaluation resources	76.5	29.5
Limited interest among staff preceptors	35.3	26.3
Expectation of competence before oncology program entry	--	46.3
Limited interest among trainees	5.9	11.6
Preceptors lack confidence in leading code status discussions	5.9	22.1
This competency is too hard to teach	0	8.4

2.3.6 Patterns of practice among trainees in clinical encounters

Trainees were asked about their experiences carrying out code status discussions with cancer patients during oncology residency. Resident-led code status discussions were reported to occur more frequently in an acute care setting (emergency room, hospital ward, or intensive care unit) compared to an ambulatory care setting. 84.2% of residents reported leading such discussions in clinic no more than once per month whereas 60% report such discussions occurring in acute care locations at least once per week. (Figure 4) 72.6% of residents report that code status discussions occur always or most often during on-call rather than work-day hours suggesting that most conversations are not supervised by a staff preceptor. (Figure 5) When residents were asked about advising patients on code status, commonly identified barriers included difficulty giving advice on this topic when meeting a patient for the first time (60%), patients and family members unwilling to discuss the topic (43.2%) and difficulty estimating prognosis (28.4%).

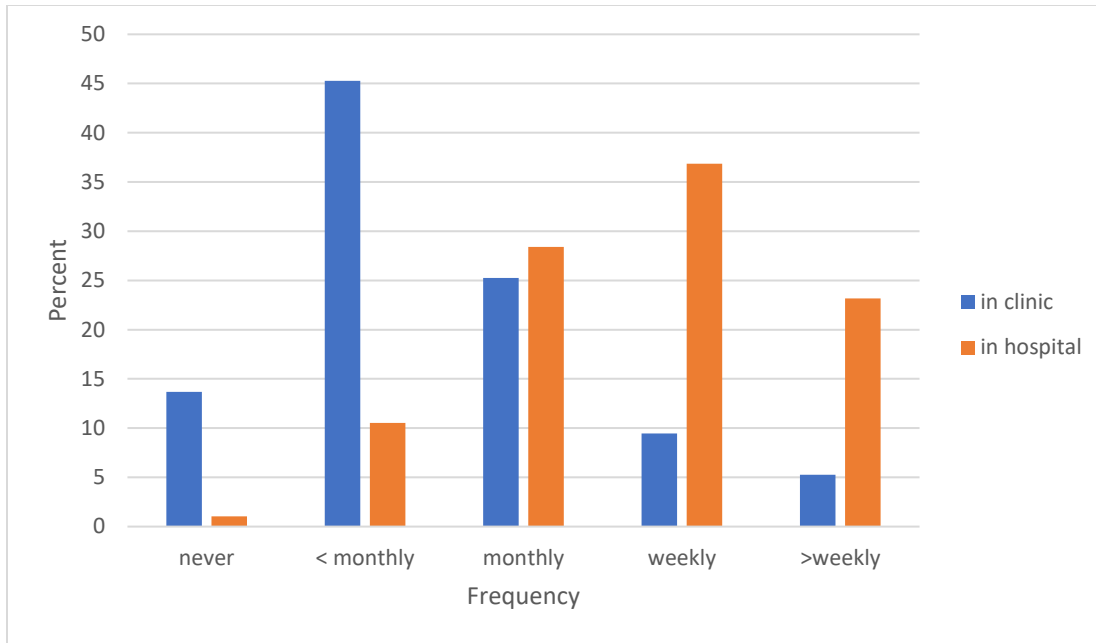


Figure 4 - Frequency of resident-led code status discussion with cancer patients in different care settings

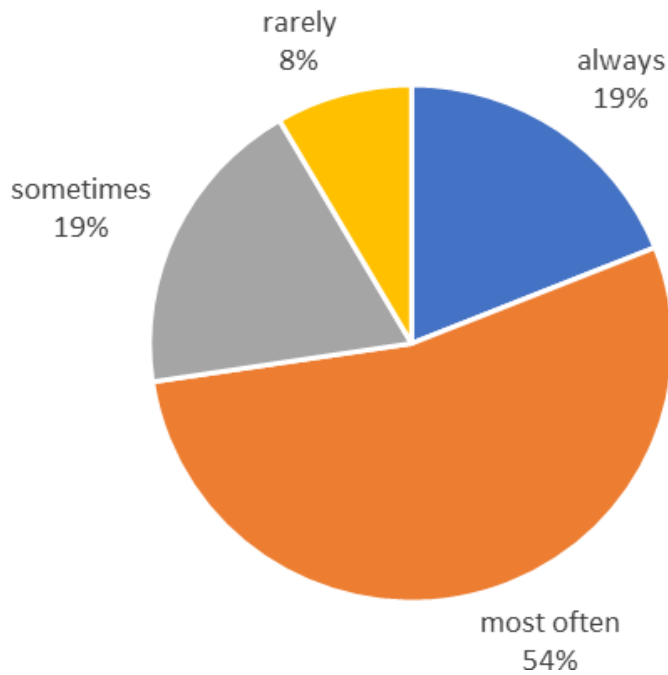


Figure 5 - Occurrence of resident-led code status conversations during on-call rather than business hours as reported by trainees in oncology programs

2.4 Discussion

In this cross-sectional study of Canadian medical and radiation oncology program directors and trainees, a gap in medical education on code status communication skills was identified. A substantial portion of residents have never experienced formal training on this topic before entering an oncology program (even among medical oncology trainees who have already completed 3 years of internal medicine residency). This is not a unique finding. Despite trainees frequently leading critical code status conversations, observation and feedback is uncommon on medical teaching wards.(42) Surveys to graduating residents in family practice and those rotating through critical care have shown a substantial lack of training for EOL decision making.(19) Our results show that many residents perceive an expectation from preceptors that they should have baseline competence in this area and this expectation is also reported by many program directors. Again, this is in keeping with findings of studies in which residents with no prior training for EOL decision-making report a lack of support and role modeling for such encounters in the critical care setting.(43) It is concerning to find that despite limited prior training, formal teaching and evaluation of code status discussion is limited during oncology residency, and mechanisms to identify learners with weakness in this area, or to offer remediation are uncommon.

Despite the apparent lack of formal training, the importance of competence in discussing code status was strongly endorsed by program directors and residents alike. Moreover, residents indicated an interest in additional training to develop this skill. There is inconsistency between enthusiasm for education on this topic, and the lack of formal training in current oncology curricula.

Barriers to education on EOL care have been previously identified. A survey to residents and medical faculty across the United States showed that a substantial portion of respondents felt unprepared to

teach EOL topics.(44) When medical school deans were surveyed, barriers to EOL care education included lack of time in curricula, lack of qualified educators and lack of leadership among faculty.(45) We found additional important barriers influencing code status communication training in oncology including a lack of teaching and evaluation tools. Program directors support the need to develop new resources, including novel web-based tools. This will inform ongoing work to design and validate educational resources on this topic that can be used in upcoming competency-based curricula for postgraduate oncology trainees.

Trainees report that resident-led code status discussions occur frequently, but are most likely to occur in the acute-care setting during after-hours coverage. Residents typically provide on-call service in academic healthcare institutions which includes admitting patients to hospital through the emergency department and managing patients admitted to oncology wards whose condition requires assessment after hours. Patient interactions generally are not supervised by staff preceptors in these circumstances.

The implications of resident-led code status discussions occurring after hours are two-fold. First, although observation and feedback were identified as teaching tools, it is likely that most code status conversations led by residents are not observed and the trainee most often receives no feedback on his or her performance. This was born out in responses where only 20% of trainees indicated receiving evaluation on this skill. Learning opportunities are missed as a consequence of carrying out code status conversations during on-call coverage. Second, the code status discussion that occurs at the time of hospital admission may influence the aggressiveness of care throughout the subsequent hospital stay. For cancer patients admitted to hospital near EOL, the decision to pursue aggressive management may lead to ICU admission, an indicator of suboptimal EOL care for terminally ill patients.(4) Residents often fail to explore a patient's values with respect to EOL care, and offer a recommendation for care.(37, 39)

Unwanted invasive intervention may be more likely as a result of poor communication. Resident-identified barriers to advising on code status (such as difficulty with estimation of prognosis), and the patient-important ramifications of code status discussions at times of hospitalization highlight the importance of skill building and education on this topic.

This study has several strengths. The response rate was high among both program directors and trainees. Both oncology disciplines and all postgraduate training levels were represented among respondents. Thus, the results of this cross-sectional study are more likely to accurately reflect current educational practices in Canada. There are some limitations to this study. For privacy, information regarding a respondent's specific institution was not collected. Understanding variation in training opportunities as a function of specific program was not possible. It is likely that more trainee responses were collected from programs with greatest enrolment, so results are likely to be influenced most by the educational practices within the largest training programs.

2.5 Conclusions

Code status communication is an important skill for clinicians in oncology, yet we found that teaching and evaluation are limited in this area for current oncology residents in Canada. PDs and residents support the need for increased teaching on this topic and current barriers to education have been identified. Results of this study provide a foundation for developing new educational resources to fill a gap in training for oncology residents. Furthermore, this communication skill is essential for other medical disciplines. Novel educational tools will be highly relevant for postgraduate trainees beyond oncology programs.

Chapter 3 - The PULSES Project: Teaching the Vital Elements of Code Status

Discussions to Oncology Residents

3.1 Background

Discussions with cancer patients around cardiopulmonary resuscitation (CPR), or ‘code status,’ are often led by residents, but formal education for this competency is lacking. We previously designed a novel communication tool, the PULSES framework, to encompass the essential components of an effective and informed code status discussion with a cancer patient. No other framework exists for use in oncology, nor are there any standard tools to evaluate a learner’s competency in this communication task in oncology.

In this study, we tested the effect of an educational workshop teaching the PULSES framework for informed code status decision-making to postgraduate trainees in oncology. Our specific research questions were:

- 1) Does training medical and radiation oncology residents to use the PULSES framework improve code status communication skills in simulated patient encounters compared to no training?
- 2) Does training medical and radiation oncology residents to use the PULSES framework improve self efficacy rating among trainees, or influence conduct of real-world code status conversations?

3.2 Methods

3.2.1 Study design and participants

To test whether teaching the PULSES framework to trainees improves communication skills, a multicentre randomized controlled trial was carried out. Study participants included residents in medical and radiation oncology programs at 3 academic centres in Ontario, Canada (McMaster University, University of Toronto and University of Ottawa). These centres were selected for reasons of feasibility (proximity of travel for the investigator), sufficiently large trainee enrolment for an adequate sample, and willingness of program directors to allot protected education time for this study.

Consenting residents participated in educational activities as part of the study intervention and completed questionnaires both at the time of the intervention and 3 months later.

All residents enrolled in participating medical oncology and radiation oncology programs were invited to attend an educational session scheduled during an academic half-day (a weekly, 4-hour time slot designated for non-clinical educational activities). Attendees were asked for consent to use data collected during the educational session for research purposes. Attendees were welcomed to participate in educational activities even if not providing consent for data collection. Participants completed a training workshop teaching the PULSES communication framework, and an observed structured clinical exam (OSCE) to test performance in simulated patient encounters. Participants were randomized to complete the training before the OSCE (experimental arm), or after the OSCE (control arm). Randomization (performed with Microsoft Excel software) was stratified for centre and oncology discipline.

The educational program was delivered on 4 occasions in November 2016 (once at McMaster University and the University of Ottawa, and twice at the University of Toronto to accommodate a larger group of trainees). The study was given approval after full review by the institutional research ethics boards in Ottawa (OHSN-REB #20160711-01H) and Toronto (Research Ethics Board of Sunnybrook Health Sciences Centre; 353-2016). The Hamilton integrated research ethics board associated with McMaster University deemed this work to be curriculum development and waived full review.

3.2.2 Educational Program

The design of the educational program was informed by adult learning theory.⁽⁴⁶⁾ The workshop (led by the same facilitator in all centres) included a didactic lecture teaching the six-step PULSES communication framework and reviewing the evidentiary basis for this approach. There was small group interactive learning (group size ranging from 5-10 learners) focused on generating comfortable phrasing for communicating with patients on this topic. This was followed by example case review and a role play exercise to put concepts into action. Content pertaining to the 6 PULSES domains is described in table 4.

Table 4 - The PULSES framework: content of the educational program

Domain	Communication objectives	Didactic content
Prognosis	<ol style="list-style-type: none"> 1. Explore patient’s current understanding of prognosis 2. Identify curative vs noncurative nature of disease 3. Discuss what to expect in the future 	<ul style="list-style-type: none"> • A prognostication framework was presented showing the interplay between patient-related, disease-related and treatment-related factors (Figure 6). • Clinical and laboratory parameters with prognostic significance in the context of advanced cancer were reviewed (e.g., 4 D’s associated with poor prognosis: Delirium, Dysphagia, Dyspnea and Decreased performance status(47)). • Validated prognostication tools were reviewed including the Palliative Performance Scale (PPS), Eastern Cooperative Oncology Group(ECOG) Performance Status Scale, and the Surveillance and Epidemiology and End Results (SEER) program data on cancer-specific survival according to diagnosis and stage.
Underlying values	<ol style="list-style-type: none"> 1. What is most important in life? 2. What is patient afraid of in future? 3. What does patient hope for in future? 	<ul style="list-style-type: none"> • Defining contributors to quality of life • Exploring concept of acceptable trade off (chance of prolonged survival vs chance of suffering) • Responding to difficult statements like “I am a fighter,” or “I am not ready to give up”
Long-term outcomes of resuscitation	<ol style="list-style-type: none"> 1. Physical consequences of resuscitation 2. Impact on quality of life 3. Inform of low chance of leaving hospital 	<ul style="list-style-type: none"> • Review of published data indicating a low chance of surviving resuscitation in the context of advanced cancer, and a minimal chance of surviving to hospital discharge(16) • Critical appraisal of literature and discussion of selection bias risk in observational studies (learners were cautioned that published statistics could over-estimate the chance of successful resuscitation)
Short-term outcomes of resuscitation	<ol style="list-style-type: none"> 1. Define CPR and resuscitation 2. Discuss low chance of success 3. Describe steps following successful CPR 	<ul style="list-style-type: none"> • Review of immediate consequences of cardiopulmonary resuscitation (e.g., physical trauma, requirement for life support, admission to intensive care unit). • Review of consequences of successful resuscitation (likely deterioration in quality of life, loss of independence and loss of dignity which may be of particular importance to a patient with a terminal cancer diagnosis)
Educated recommendation	<ol style="list-style-type: none"> 1. Explore options 2. Advise what is medically appropriate 3. Make recommendation based on patient’s values 	<ul style="list-style-type: none"> • Defined comfort care vs active medical management vs full resuscitation • Explored the importance of a values-based recommendation to achieve informed consent and patient-centred care
Summarizing and documenting the encounter	<ol style="list-style-type: none"> 1. Check understanding 2. Avoid judgement, show empathy 3. Document conversation, communicate with family 	<ul style="list-style-type: none"> • Learners were instructed to check understanding from patient and family members and to explore whether the patient desires assistance conveying the code status decision to loved ones • The ultimate decision should be clearly recorded in the medical record in a location accessible to all other providers in the circle of care

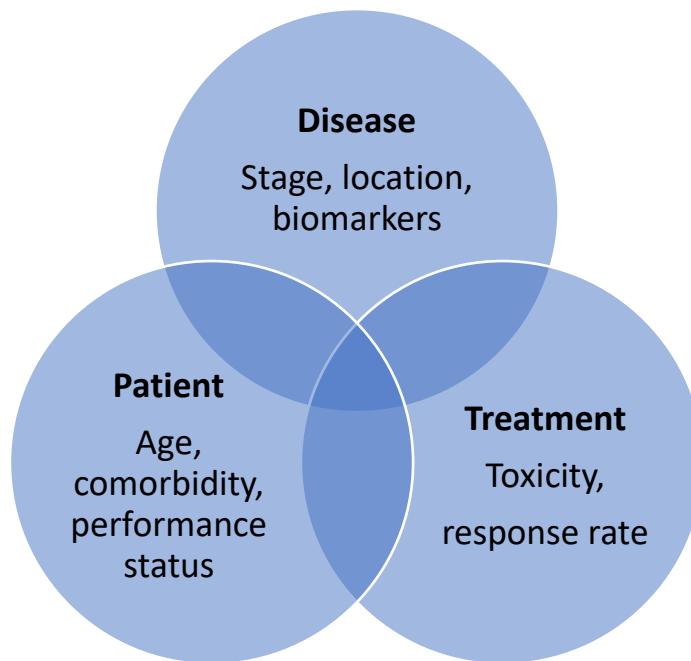


Figure 6 - Components of prognostication for advanced cancer patients: disease-related, patient-related, and treatment-related influences on expected prognosis

3.2.3 The OSCE

Development of the OSCE Stations:

Five simulated patient encounters were developed and tested in a pilot OSCE in August 2016. Scenario materials included a detailed character summary for the standardized patient (SP) and a station summary for the trainee. The 5 scenarios represented a spectrum of cancer patients with non-curable illness and varying prognoses. In each encounter, the learner was expected to lead a code status discussion. SPs were oriented to the scenarios by the investigator (OL) and a professional coordinator from the standardized patient program at McMaster University. Scenarios were tested in a pilot OSCE with 5 oncology fellows (recent graduates from residency programs in medical or radiation oncology).

In this exercise, SPs evaluated the learners using a standardized scale, but did not give face to face feedback. Comments from participants and resulting changes to final OSCE scenarios are summarized in Table 11 in Appendix D.

Based on feedback from fellows and SPs, the three most effective scenarios were selected for use in the study. Station summaries are provided in Appendix E. Briefly, the 3 scenarios are described:

- 1) An elderly patient with advanced lung cancer refractory to multiple therapies presenting with life-threatening intercurrent illness (expected survival of days).
- 2) A young woman with a recent diagnosis of advanced breast cancer with leptomeningeal spread (associated with poor prognosis) presenting with advancing symptoms of her disease (expected survival of weeks).
- 3) A middle-aged patient with an advanced gastrointestinal cancer soon to start on life-sustaining chemotherapy. The expected prognosis is in the range of 1 year, yet intercurrent infection requires hospitalization on the current presentation.

Study-related OSCE

The final OSCE included 3 scenarios. Experienced SPs were used for all scenarios in all centres. SPs were oriented to the scenarios by the same investigator in all centres (OL). In 2 of 3 centres, a professional trainer from the university-affiliated SP program also participated in orienting the actors. For consistency across centres, SPs were given instruction on each character's medical condition, physical state, emotional state, social context, philosophical beliefs and values. Standardized phrasing was provided including an opening statement, responses to common questions and prompts to facilitate conversation with the trainees. Orientation materials for SPs are shown in Appendix F.

Expert raters evaluated communication with standardized rating tools. Trainees were provided with a clinical summary of the station before entering the room. OSCE Stations were 12-minute encounters followed by a 4-minute break. During the break the trainee reviewed materials for the next station and evaluators recorded scores.

3.2.4 Measurement tools

Subjects' performance in each OSCE station was rated using 3 tools (all scales shown in Appendix C):

- 1) PULSES rating scale: this content-specific tool is an 18-item checklist. Each item is scored out of a maximum of 2 points (0= not attempted, 1= attempted, but needs improvement, 2= competent in this task), for a maximum total of 36 points. The PULSES rating scale was developed according to international standards informed by classical test theory (see Appendix A).(48)
- 2) The Communication Skills Assessment Form (CSAF): an 18-item checklist with 1 point allotted per item for a maximum total score of 18 points. This tool is considered a gold standard of evaluating code status communication, has been previously validated among medical learners, is not specific to the oncology context, and is more heavily weighted to communication style. (26)
- 3) Global Rating Scale (GRS): a simple, subjective rating approach which has been shown to distinguish expert and novice learners differently than an item-based checklist.(49) A GRS is more generalizable and less content-specific compared to a checklist for evaluation of clinical skills in an OSCE.(50) A Likert scale with 7 anchors was developed, since it is difficult to judge an item across more than 7 categories due to limitations of information processing.(51) Having fewer than 7 response options risks losing discriminating power due to end aversion and positive skew.(48) The adjectival response options were selected to illustrate a gradient of

competence. An attempt was made to use short descriptors, free of jargon to maximize interpretability. For anchoring descriptors, absolute terms were avoided to limit end aversion.

In addition to OSCE scores, participants completed questionnaires before and after the educational intervention and after a 3-month delay (See Appendix G). Pre/post questionnaires addressed demographic details, self-efficacy rating regarding code status communication with cancer patients, and satisfaction with the educational format. The delayed questionnaire explored to what extent subjects had incorporated the PULSES framework into clinical encounters and whether it had been an effective approach in practice.

3.2.5 Outcomes

The primary outcome was difference in mean scores between the experimental and control groups in the OSCE according to the novel PULSES rating scale. Secondary outcomes included difference in mean OSCE scores between groups on the CSAF and GRS, and correlation between scores from the 3 different rating scales. Based on participant questionnaires at various time points, additional secondary outcomes included within-subject change in self-confidence rating before and after the educational intervention, and rate of participant-reported clinical application of the communication framework 3 months post-intervention.

3.2.6 Statistical analysis

A total sample size of 50 subjects, 25 for the intervention group and 25 for the control group, was the target for enrolment. The sample size was determined based on α of 0.05 and 80% power to detect effect size of 0.7 with respect to the primary outcome (OSCE scores from the PULSES scale). In education, effect size of 0.4 is considered to represent the natural learning process.(52)

OSCE scores were the cumulative scores across all 3 stations using the PULSES scale (maximum score of 108 points), the CSAF scale (maximum score of 54 points), and the global rating scale (maximum score of 21 points). Descriptive statistics were generated including mean and standard deviation for OSCE scores, independent samples t-test was used to compare mean scores between groups and Pearson's correlation was used to determine association between rating scales. Within-subject change in self-confidence rating before and after the intervention was summarized with a mean differential score based on a 5-point Likert scale. These analyses were carried out using SPSS software. Descriptive statistics generated with Microsoft Excel software were used to summarize responses from the 3-month post-intervention questionnaire assessing clinical application of the PULSES approach.

Some items on the OSCE rating scales were not scored which resulted in missing data. For analysis of the primary outcome (difference in mean OSCE scores between groups), a conservative approach was taken, and missing values were replaced with zeros (assuming that the item was not overlooked, but in fact the task had not been performed). In one case, the GRS was not completed, and the affected trainee was not included in the GRS analysis.

A series of ANOVAs were conducted to explore the relationship between factors and the primary outcome, OSCE scores:

- A 2-way training condition (experimental vs. control) X center (McMaster vs. Ottawa vs. Toronto)
- A 2-way training condition (experimental vs. control) X discipline (medical vs. radiation oncology)
- A 2-way training condition (experimental vs. control) X level of training (junior vs. senior)

We defined junior residents as PGY1-2 and senior residents as PGY3-5, a priori. The junior resident subgroup consists of radiation oncology residents exclusively, since medical oncology training begins in PGY4. These exploratory analyses enabled us to probe the influence of setting and training level factors on the effectiveness of the training.

3.3 Results

3.3.1 Population

Across all participating programs, total population size was 70 residents (total program enrolment). Fifty residents attended the educational sessions. Three residents did not participate in the OSCE and therefore did not contribute data to the primary analysis, but completed questionnaires. One resident did not consent to contribute data from any study-related activities. Thus, 46 subjects contributed to the analysis of the primary outcome. Groups were well-balanced for program, year of training and other demographic characteristics. (Table 5)

Table 5 - Study population

	PULSES arm (n = 23)	Control arm (n = 23)
Program		
Medical oncology	9	9
Radiation oncology	14	14
Postgraduate year (PGY)		
PGY1	3	4
PGY2	4	4
PGY3	2	2
PGY4	9	8
PGY5	5	5
Age (mean ±SD)	30.2±3.3	30.2±4.1
Male	13	16

3.3.2 Efficacy according to OSCE scores

Participants in the experimental group had higher mean PULSES score (80.4±13.5 vs 63.4±9.7; $p < .001$; maximum score = 108), higher mean CSAF score (39.0±7.4 vs 32.7±4.4; $p = .001$; maximum score = 54), and higher mean rating on the GRS (16.7±3.2 vs 13.5±2.3; $p < .001$; maximum rating = 21) than those in the control group (Table 6). Scores for all 3 rating scales were highly correlated (Table 7). Notably, the PULSES scores were well correlated with the scores from the benchmark CSAF scale ($r = 0.86$).

Table 6 - OSCE scores across study groups

	Experimental arm		Control arm		P	
	n	Mean (SD)	n	Mean (SD)		
PULSES Scale						
Total Population	23	80.4 (13.5)	23	63.4 (9.7)	<0.001	
Discipline						
Medical oncology	9	83.2 (12.2)	9	66.7 (10.0)		
Radiation oncology	14	78.6 (14.3)	14	61.4 (9.2)		
Centre						
University of Toronto	12	73.7 (13.0)	11	59.5 (8.0)		
University of Ottawa	6	88.0 (9.8)	6	66.7 (11.8)		
McMaster University	5	87.4 (11.1)	6	67.3 (8.9)		
CSAF Scale						
Total Population	23	39.0 (7.4)	23	32.7 (4.4)		0.001
Discipline						
Medical oncology	9	39.8 (6.5)	9	34.8 (4.2)		
Radiation oncology	14	38.5 (8.3)	14	31.3 (4.2)		
Centre						
University of Toronto	12	35.4 (7.8)	11	30.9 (3.2)		
University of Ottawa	6	45.5 (2.7)	6	37.0 (5.0)		
McMaster University	5	39.8 (5.4)	6	31.5 (3.3)		
GRS						
Total Population	22	16.7 (3.2)	23	13.5 (2.3)	<0.001	
Discipline						
Medical oncology	9	17.1 (3.2)	9	14.4 (2.7)		
Radiation oncology	13	16.5 (3.3)	14	12.9 (1.9)		
Centre						
University of Toronto	12	15.9 (3.7)	11	13.8 (2.0)		
University of Ottawa	6	18.3 (1.5)	6	13.3 (3.3)		
McMaster University	5	17.0 (2.9)	6	13.2 (2.0)		

Table 7 - Correlation of scores across rating scales

Scales correlated	Pearson coefficient	P
PULSES – CSAF	0.864	<0.001
PULSES – GRS	0.891	<0.001
CSAF – GRS	0.797	<0.001

The main effect was significant across all 3 scales, and no interaction was detected between training condition and centre, or between training condition and discipline. A significant interaction was detected between training condition and level of training. The intervention showed benefit for both junior residents (PGY1-2), and senior residents (PGY3-5) with higher mean scores in the experimental group regardless of rating scale. (Table 8) The magnitude of difference between intervention and control groups was greater for junior trainees as compared to the senior trainees, with a significant test of interaction between these factors detected with scores from the PULSES scale ($p = 0.038$), the CSAF ($p = 0.035$) and the GRS ($p = 0.015$). The PULSES training program seemed to have greater impact on the less experienced learners.

Table 8 - OSCE scores across study groups according to level of training

	Experimental arm		Control arm		Total		Test of interaction
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	
PULSES Scale							
Level of training							
Junior	7	87.0 (8.6)	8	59.6 (10.3)	15	72.4 (16.9)	P = 0.038
Senior	16	77.5 (14.4)	15	65.5 (9.0)	31	71.7 (13.4)	
Total	23	80.4 (13.5)	23	63.4 (9.7)	46	71.9 (14.4)	
CSAF Scale							
Level of training							
Junior	7	43.1 (4.1)	8	31.3 (4.8)	15	36.8 (7.5)	P = 0.035
Senior	16	37.2 (8.0)	15	33.4 (4.2)	31	35.4 (6.6)	
Total	23	39.0 (7.5)	23	32.7 (4.4)	46	35.8 (6.9)	
GRS							
Level of training							
Junior	7	19.0 (1.1)	8	12.8 (1.8)	14	15.4 (3.5)	P = 0.015
Senior	16	15.8 (3.3)	15	13.9 (2.5)	31	14.9 (3.1)	
Total	22	16.7 (3.2)	23	13.5 (2.3)	45	15.1 (3.2)	

3.3.3 Participant reported outcomes

Self-assessed confidence level increased on average immediately following the PULSES workshop compared to baseline (mean change +0.41, SD 0.53, measured on a 5-point Likert scale). 45% of participants indicated an increase in confidence, 2% (1 respondent) indicated a decrease in confidence, and the remaining 53% reported no change in confidence (the majority of whom had indicated a high baseline level of confidence). (Figure 7) When asked to provide feedback about the learning experience, 98% of participants rated the workshop as clinically applicable, and 98% of participants would recommend the PULSES training to other oncology residents.

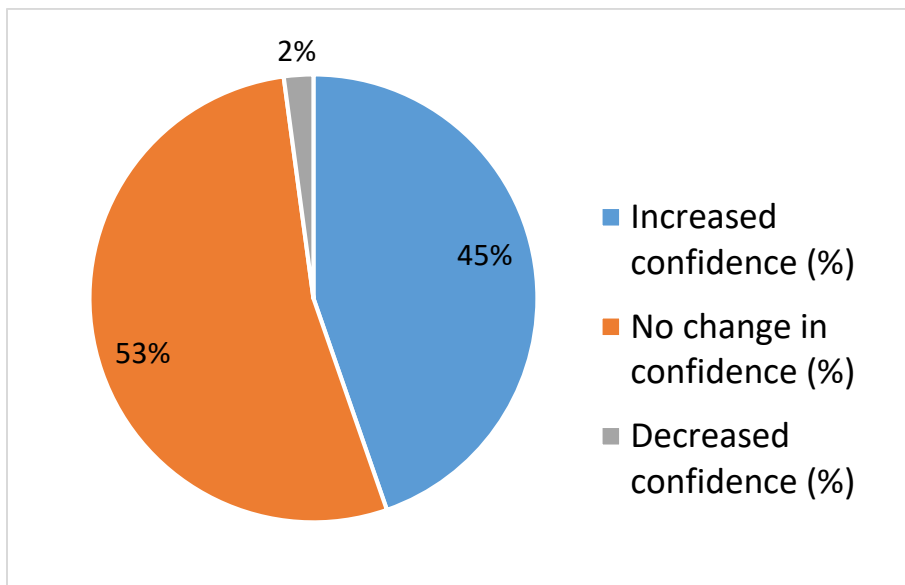


Figure 7 - Change in self confidence rating among residents before and after PULSES training intervention

32 residents provided responses to the questionnaire distributed 3-months following the intervention (66% response rate). Among respondents, 87.5% of participants reported applying the PULSES framework in clinical work, and 62.5% felt the framework helped communicate with patients about code status.

3.4 Discussion

In this randomized controlled trial of an educational intervention for skill-building among oncology residents for code status discussions, the PULSES training improved performance among participants in simulated patient encounters. Improved communication scores were not scale-specific. We found benefit associated with the training program based on a novel, content-specific scale, a previously validated communication scale, and a subjective global rating scale. Subgroup analyses were limited by small numbers of participants in groups of interest; however, there was apparent benefit associated with the training program regardless of oncology discipline or centre of training.

The benefit of communication training was greatest among junior residents. This may indicate that learners with less practical experience in this form of communication may be more likely to change behaviour as a result of training. This is in keeping with literature showing experienced, or 'expert' learners are more likely to show inflexibility in strategy and overconfidence.⁽⁵³⁾ As a result, senior trainees may be less likely to adopt a new approach to communication on code status. Program directors should consider incorporating this material into curricula early in postgraduate training. We included use of both an item-based checklist evaluation and a GRS. The former is expected to favour novice learners, while the latter is expected to favour experts.⁽⁴⁹⁾ We found that junior learners outperformed senior residents in the experimental arm on both the checklist rating scale and the GRS. This may suggest that senior residents are not yet expert in this communication competency and still stand to benefit from experiencing the PULSES training.

Our findings are in keeping with other literature showing benefit of education on this topic; for example, Oncotalk is a multiday residential retreat for postgraduate oncology trainees which has been rigorously studied and shown to help learners develop a spectrum of communication skills for difficult

conversations in oncology and EOL care.(34) Single-day interventions have been shown to help learning on this topic in other medical fields,(26, 35) but this work confirms the benefit of a 1-day workshop for oncology learners.

A novel aspect of this educational intervention is the 6-step approach summarized by the mnemonic acronym PULSES. Grouping complex information into a limited number of chunks has been described as an important way to overcome limitations in short-term memory.(51) Accordingly, mnemonic acronyms are common in medical training. The PULSES framework is comparable to the SPIKES protocol for breaking bad news which has been widely adopted as a teaching tool for undergraduate and postgraduate medical learners, perhaps due to its simplicity and transferability.(29) Code status discussions with terminally-ill cancer patients, like breaking bad news conversations, can be difficult, emotionally-charged encounters which are challenging for trainees. Having a stepwise protocol can help a learner to organize a challenging discussion. This may be a factor contributing to the increased confidence reported by learners in this study. Additionally, if learners work through the 6 steps in the PULSES framework, they are likely to cover the necessary content to ensure an evidence-informed and values-based decision is reached with the patient.

This study has several strengths. We followed a rigorous design involving comparative groups with different training conditions. For feasibility, to assess our primary outcome (communication ability as measured in the OSCE) we used a comparative group design rather than a pre-test/post-test design looking at within-subject change in performance. The latter design would require all subjects to complete 2 assessments. The OSCE, a common evaluation tool in medical education, is an optimal method of assessment allowing for direct observation of a skill in a high-fidelity simulated environment. Yet, an OSCE is time and resource-intensive. Protected resident educational time is a limited resource. Requiring subjects to complete two OSCEs would have been a barrier to program engagement and study

enrollment. It was necessary to design a program within a 4-hour academic half-day timeslot. A comparative group design through randomization was the practical approach within these restrictions.

This was a multicentred study which allowed a sufficient sample size, but also increases generalizability since learners across centres may have varying levels of baseline skill depending on the local preceptors, curriculum, and site of previous training. For example, medical oncology residency follows internal medicine residency. It is common for residents to stay within the same institution for subspecialty training after internal medicine. The University of Toronto internal medicine curriculum includes a strong exposure to training on code status conversation. Accordingly, medical oncology residents in Toronto may have a higher baseline level of skill compared to other centres.

The PULSES framework offers a standardized approach to a challenging conversation and addresses an identified gap in current postgraduate oncology curricula. Canadian oncology residency programs are moving towards a competency-based educational format which emphasizes repeated, objective evaluation of a defined list of skills including communication competencies.(54-56) The aim is to standardize programs across the country with respect to criteria for advancement of trainees. The PULSES framework and associated evaluation materials for the OSCE can be disseminated among programs allowing standardized teaching and evaluation on this topic.

This study has some limitations. Regarding study proceedings, raters were not blinded to training condition. In addition, since the intervention was delivered on different dates across centres, there is a chance of contamination if participants discussed the PULSES framework before enrolling in the study. Based on geographic distribution of centres, contamination is unlikely. Regarding application of results, to use the PULSES rating scale for summative evaluation, or to establish competency, minimally-important difference in PULSES scores must be explored. While we established a statistical difference in

mean scores according to training condition, we did not aim to determine at what threshold score a learner should be deemed competent in this skill. In future work, we propose to use the borderline method to identify a threshold score reflecting minimal competence in this communication skill. This would involve use of a GRS where one of the response options is 'borderline competence'. The mean checklist score for learners rated as having borderline competence becomes the threshold for passing the exam station.(57)

Educational interventions can be confounded when an outcome measure (or in this case the rating scale used) is directly linked to the material recently taught (the so-called phenomenon of 'teaching to the test'). If a comparator group has not received any training, it would not be surprising to identify benefit in the trained group. The PULSES rating scale was mostly content-specific, and vulnerable to this bias. For this reason, we used scores from a previously validated rating scale as a benchmark. The CSAF scale is not specific to oncology content and more heavily weighted to communication style compared to the PULSES scale. Moreover, we found consistent results with a global rating scale which is a subjective rating of a learner's overall performance. In other contexts, a global rating has been shown to better identify an expert from a novice compared to an item-based checklist.(49) The strong correlation of all 3 rating scales in this study contributes to the construct validity of the PULSES communication framework and the criterion validity of the PULSES rating scale.

The control group in this study had received no training at the time of evaluation. We felt it was important to establish a benefit of teaching the PULSES scale compared to no training rather than compared to an alternative training method. There is no other structured training program that is considered a standard, hence the control group reflects the current baseline level of skill of oncology learners.

For reasons of feasibility, all study-related activities in each centre happened on the same day. Accordingly, we tested learners in the experimental group immediately after the training workshop. As a result, we cannot assess delayed learning retention. The 3-month delayed survey showed good uptake of the communication framework among participants and this may be a surrogate for delayed retention of learning; however, this outcome will need further study in future work. Similarly, we recruited only enough expert raters in each centre for a single evaluator in each OSCE station. We cannot assess inter-rater reliability of the PULSES rating scale, and this will require further study in future.

Finally, OSCE station summaries included a specific statement of prognosis. In a real-world clinical encounter prognosis may be uncertain. Accordingly, defining prognosis in the stem reduces the fidelity of the simulation, and the ability of the OSCE to predict a learner's performance in subsequent clinical practice may be limited. As per feedback from participants in the pilot OSCE, it was necessary to indicate the expected prognosis explicitly to orient the learner in each encounter. Moreover, the aim was to evaluate competence as a communicator, not as a medical expert.

3.5 Conclusions

The PULSES training improved performance among oncology residents for code status discussions in simulated patient encounters. Improved communication scores were not scale-specific. Educational activities were well rated by participants and had impact on subsequent clinical encounters. The PULSES framework offers a standardized approach and can be incorporated into competency-based curricula for postgraduate oncology programs addressing a current gap in medical education in Canada.

4.0 Conclusions

4.1 Findings and significance

In the first phase of this work, we carried out an environmental scan assessing current teaching practices and perceived gaps in training for code status communication among medical and radiation oncology programs in Canada. We learned that there is a deficiency of formal teaching and evaluation for this competency, and that learners want more training and program directors want more teaching resources. There was enthusiasm from learners and educators alike for enhancing current education on this topic. The identified needs from the survey informed subsequent work.

We followed a rigorous methodology to define the content necessary for an informed and compassionate conversation leading to a patient-centred decision on code status. We distilled the content into a novel communication framework, a six-step approach to code status discussion summarized by the mnemonic acronym PULSES. The six domains are prognosis, underlying values, long and short-term outcomes of resuscitation, summarizing and documenting the encounter. The content of the framework is consistent with literature and supported by expert consensus. The use of a simple, succinct framework with an associated mnemonic optimizes the utility of this communication tool in medical education.

We developed educational resources to teach the PULSES framework including a workshop, OSCE scenarios and a content-specific rating scale for evaluation of a code status communication encounter. We studied the effect of teaching the PULSES framework to residents in oncology training programs through a randomized multi-centre trial. Measuring communication skills in an OSCE, we found that the PULSES training improved quality of code status conversations in the simulated patient encounters.

Improvements were significant across multiple rating scales including both content-specific and subjective assessments. The PULSES training was well received by participants, improved their confidence, and had impact on real patient encounters in the 3-month interval following the intervention.

With an upcoming transition to competency-based learning in Canadian postgraduate training programs, timing is opportune for innovation in this area. Residency programs will soon be tasked with repeated, objective assessment of core competencies including complex communication skills to determine a resident's readiness to advance in training. The PULSES framework, workshop and OSCE are standardized, transferable educational tools which can be incorporated into curricula.

4.2 Lessons learned

In addition to the knowledge gained from results of this work, the investigator gleaned important lessons regarding research practice. To achieve an adequate sample for this project, we carried out a multi-centre study. When study activities are distributed geographically, successful execution of the project hinges on identifying an enthusiastic local champion for the project in each centre.

Collaborators in Ottawa and Toronto were critical for overcoming logistical challenges of coordinating resident education time, booking necessary facilities, and liaising with the local research ethics board (and the legal department in one centre). The primary investigator corresponded routinely with local investigators which was useful for troubleshooting challenges.

We used the OSCE, a gold standard in medical assessment, to measure our primary outcome. We learned that an OSCE is complex to coordinate and resource intensive. Standardized patient programs are commonly available through medical schools. Actors are trained to play patients according to the

specific illness scenario. This creates a high fidelity simulated encounter and allows direct observation of clinical skills in a controlled environment. Only some medical schools subsidize standardized patient programs. Accordingly, costs associated with OSCEs are variable. For example, the University of Toronto is associated with a high quality standardized patient program, but due to lack of subsidy, the cost was around 4-fold higher than at other centres. The cost of OSCE-related resources may be prohibitive for some residency programs to build the PULSES training into the curriculum. Alternative evaluation formats may need to be considered.

Another challenge was recruitment of expert observers. To accommodate multiple rotations of learners, the duration of the OSCE was 4 hours. This is a substantial time commitment for a faculty member. Rather than a typical academic session requiring a single lecturer, the OSCE required the commitment of multiple educators to act as observers. Despite exhaustive efforts, we were not able to recruit sufficient volunteers to act as observers for one of the OSCE sessions in Toronto. We were grateful to have volunteers from Hamilton willing to fill the gap, but this was possible only due to the relative proximity of the 2 centres. To implement OSCEs across oncology training programs in Canada, each program will need enthusiastic local faculty to act as observers.

Attendance for the workshops was consistently around 60% of the target population due to resident absence for legitimate reasons (e.g., on-call the night prior, on vacation, on an elective rotation at another site). The traditional workshop format is resource-intensive and fixed in geographic and temporal delivery. Typically, a topic covered in a structured academic curriculum for postgraduate medical training is not repeated for a given cohort of learners, so if a trainee misses a session, he or she is unlikely to have another opportunity for exposure. For this reason, we will explore electronic learning formats in future work.

4.3 Next steps

Since a traditional workshop and OSCE can be costly, resource intensive, and unlikely to reach a full target audience, we will develop an electronic learning module based on the content of the PULSES workshop. Electronic learning modules are a novel educational format increasingly used in early and continuing medical education. Electronic learning modules offer the benefit of flexibility with regard to timing, sequencing and geographic location of learning encounters compared to traditional didactic learning. Medical education literature shows that online learning tools can produce favourable change in knowledge, satisfaction, attitudes and confidence. Studies have shown improvement in knowledge gain and behavior change from electronic learning modules at least equivalent to small-group learning among clinicians.(58) There is a lack of literature to identify whether electronic learning modules can be effective for teaching communication skills to medical learners. Moreover, there is a lack of literature comparing various teaching formats for communication around end of life care.(59) We hope to rigorously compare various learning formats in this area to help fill a knowledge gap regarding optimal and easily disseminated teaching methods for code status communication training.

The PULSES study was geared toward learners in oncology, yet code status conversations are commonplace in other disciplines. General internal medicine is a postgraduate training program in which residents commonly lead code status conversations with chronically and terminally-ill patients upon admission to hospital in the context of an acute deterioration in health. These learners could benefit from training with the PULSES communication framework. The content of the framework is relevant and applicable to non-cancer diagnoses, but the educational curriculum which was originally framed around oncology content will need revision to reflect a spectrum of serious illnesses.

Finally, our results were based on simulated patient encounters. Of great importance will be examination of how training residents with the PULSES framework impacts patient-level outcomes. In future work we aim to study effect on patient satisfaction, family or care-giver satisfaction, documentation of a code status directive in a medical chart, attending physician agreement with a code status decision, and rate of documentation of a ‘do not resuscitate’ order.

We have developed a simple communication framework to help learners build skill and confidence in leading code status conversations, which can be among the most challenging encounters in clinical practice. Our results show that this skill can be developed through formal education which is encouraging. Through future work, we aim to make this content applicable and accessible to a variety of residency training programs. Ultimately, building capacity for clear and effective code status communication with patients will contribute to high quality EOL care in Canada.

5.0 References

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Appendix A: Development of the PULSES communication framework and rating scale

Through a rigorous process, we developed the PULSES framework, a six-step approach to code status conversation to help learners build skill and confidence for this communication task. Development of the communication framework is summarized below.

Item generation

A list of statements was generated to reflect potentially relevant elements of a code status discussion with a cancer patient. Items included content of discussion and communication behaviours. Items were generated based on clinical experience of the investigator and literature review. Additionally, in conjunction with content validation, an expert panel contributed to item generation. Experts were asked to consider communication tasks that a resident should demonstrate to be deemed competent in this area. A list of 54 potentially relevant items was generated. (Table 9)

Content validation

A multidisciplinary expert panel of 10 clinicians and non-clinicians rated relevance of items. Experts included clinicians in the areas of medical oncology, radiation oncology, intensive care and palliative care. A medical oncology fellow was included providing the viewpoint of a new graduate in addition to the more experienced practitioners. Two lay experts in patient communication were included to represent a non-clinician perspective. Using the scores from expert review, a content validity ratio (CVR) was calculated according to the methods proposed by Lawshe and modified by Waltz and Bausell, then by Lynn.(60-62) Raters indicated that the item list was comprehensive, and no additional items were

added. Some found that items clustered around repetitive themes and similar items could be combined. In addition, modifications were suggested to improve clarity. (Table 9)

Table 9 - Full item list and calculated content validity ratio (CVR) based on expert ratings

Item	CVR
Asks patient's understanding of prognosis	1
Discusses the curative versus palliative nature of current treatment	0.8
Gives estimate of expected survival	0.8
Discusses what effective treatment options remain	0.4
Discusses the current or expected performance status	0.4
Explains how performance status can prevent further cancer treatment	0.4
Discusses the expected trajectory of disease if current therapy is interrupted due to a resuscitation and recovery period	0.4
Explores patient's current quality of life	0.8
Explores what makes life worth living for the patient	0.8
Explores what state of health is worse than death	0.4
Explores the patient's fears	0.8
Asks about the patient's goals	1
Asks about upcoming life events the patients hopes to reach	0.4
Asks what the patient hopes for the future	0.8
Discusses the risk of long-term brain damage after CPR	0.2
Discusses the physical trauma from CPR	0.4
Discussed the painful recovery after a successful resuscitation	0.4
Discusses likelihood of a long hospital stay after a successful resuscitation	0.2
Discusses expected worsening of physical ability after resuscitation	0.4
Discusses long-term impact on quality of life after a resuscitation	0.6
Explains the low chance of leaving hospital after a resuscitation	0.6
Explains that a loss of performance status may lead to stopping cancer treatment	0
Indicates that CPR is unlikely to be successful	1
Indicates that after successful CPR admission to the ICU is expected	0.6
Indicates that after successful CPR it is common to require a breathing tube in the throat	0.6
Indicates that after successful CPR it is common to require life support	0.6
Indicates that after successful CPR it is common to be in a comatose-state	0.6
Indicates that after successful CPR it is common to be unable to talk to loved ones	0.6
Indicates that after successful CPR family members may be asked to decide when to stop life support	0.4
Indicates that after successful CPR it is common to experience another cardiorespiratory arrest within a short timeframe	0.4
Explains the difference between life sustaining therapy and CPR	0.6
Describes cardiopulmonary arrest	0.2
Describes CPR	0.6
Describes mechanical ventilation	0
Explains that outcomes of CPR on television are often unrealistic	0
Makes a recommendation on a medically appropriate code status	0.8
States whether or not CPR is perceived to be futile	0.2

Item	CVR
Suggests alternative courses other than CPR, such as comfort care	0.6
Makes a recommendation based on the patient's values	0.6
Asks for agreement regarding the code status	0.8
Asks for understanding of the code status decision	1
Summarizes discussion	0.8
Asks patient to summarize discussion	0.2
Indicates intention to document decision in the medical record	0.4
Shares information in chunks and checks for understanding	0.6
Creates a dialogue with the patient	0.4
Allows ample opportunity for the patient to talk	0.8
Avoids jargon	0.4
Demonstrates empathy	1
Is able to form rapport with the patient	0.6
Demonstrates confidence	0.4
Offers opportunity for the patient to ask questions	0.6
Overall impression of content of the discussion	0.6
Overall impression of communication skills	0.6
Overall impression of competence in determining code status	0.8

Content coverage

Items were classified by theme to establish whether a spectrum of communication domains were represented among highly relevant items. (Table 10) Six thematic domains emerged including prognosis, values, short-term outcome of CPR, long-term outcome of CPR, provision of a recommendation and style of communication. The 6 domains comprise the proposed communication framework summarized by the acronym PULSES. (Table 1)

Table 10 - Assessment of content coverage

Item	Prognosis	Underlying values	Long-term outcome of CPR	Short-term outcome of CPR	Educated recommendation	Summary, style of communication
Asks patient's understanding of prognosis	X					
Discusses the curative versus palliative nature of current treatment	X					
Gives estimate of expected survival	X					
Explores patient's current quality of life		X				
Explores what makes life worth living for the patient		X				
Explores the patient's fears		X				
Asks about the patient's goals		X				
Asks what the patient hopes for the future		X				
Discusses long-term impact on quality of life after a resuscitation			X			
Explains the low chance of leaving hospital after a resuscitation			X			
Indicates that CPR is unlikely to be successful				X		
Indicates that after successful CPR admission to the ICU is expected				X		
Indicates that after successful CPR it is common to require a breathing tube in the throat				X		
Indicates that after successful CPR it is common to require life support				X		
Indicates that after successful CPR it is common to be in a comatose-state				X		
Indicates that after successful CPR it is common to be unable to talk to loved ones				X		
Explains the difference between life sustaining therapy and CPR				X		
Describes CPR				X		
Makes a recommendation on a medically appropriate code status					X	
Suggests alternative courses other than CPR, such as comfort care					X	
Makes a recommendation based on the patient's values					X	
Asks for agreement regarding the code status					X	
Asks for understanding of the code status decision					X	
Summarizes discussion						X
Shares information in chunks and checks for understanding						X
Allows ample opportunity for the patient to talk						X
Demonstrates empathy						X
Is able to form rapport with the patient						X
Offers opportunity for the patient to ask questions						X
Overall impression of content of the discussion						X
Overall impression of communication skills						X
Overall impression of competence in determining code status						X
Total number of items per domain:	3	5	2	8	5	9

The PULSES Scale

The items of greatest relevance were included in a checklist-based scale for use in evaluating residents in observed clinical encounters. The final scale contains an 18-item checklist distributed equally across the 6 core themes of the communication model. A global rating scale (GRS), a subjective assessment of the learner's overall competence, is included at the end of the scale. Appendix C shows the final format of the scale.

Face validity assessment

A second multidisciplinary expert panel (9 new raters including medical and radiation oncologists, palliative and intensive care clinicians, oncology nurses and medical educators) was recruited to review the proposed framework and rating scale for clarity, language, content and usability. Changes were made according to feedback. The relevance of content was supported unanimously, but some items were revised for clarity.

Based on feasibility constraints, all experts were sampled from a single institution which is a limitation. This introduces possible bias since colleagues can develop similar practice patterns and may be more likely to provide similar assessments of item relevance.

Appendix B: Survey tools for environmental scan of current code status teaching

Survey to program directors

The following survey addresses current teaching of ‘code status’ communication skills for postgraduate oncology trainees. This refers to exploration of a patient’s wishes regarding cardiopulmonary resuscitation (CPR). This does not refer to general communication skills for breaking bad news, transitioning to palliative care or leading difficult conversations with seriously-ill patients.

1. Program in oncology:
 - Medical oncology
 - Radiation oncology

2. Does your postgraduate program curriculum currently include *formal* teaching on code status discussion skills for all trainees?
 - YES (if yes, please move onto question 3)
 - NO (if no, please move onto question 4)

3. If answering YES to question 2, please identify all teaching formats currently in use (check all that apply). If answering NO to question 2, please move on to question 4.
 - Academic half day
 - Didactic lecture
 - Case-based learning
 - Role-play
 - Simulation-based learning
 - Mandatory direct observation by staff with feedback given to trainee in a clinic-based patient encounter
 - Mandatory direct observation by staff with feedback given to trainee in a hospital-based (e.g. ward or ER) patient encounter
 - Other (please specify): _____
 - Please provide further detail regarding current teaching of code status discussions:

4. Does your postgraduate program curriculum currently include *informal* teaching on code status discussion skills for *all* trainees in Oncology?
 - YES
 - If YES, please provide further detail:

 - NO

5. How much time in total is committed to teaching code status discussion skills to trainees in your program over the course of their residency (including formal and informal teaching)? Please select one option:

- No time
- Under 1 hour
- 1-3 hours
- 3-5 hours
- More than 5 hours

6. Does your postgraduate residency training program currently evaluate competence in code status discussion skills for *all* trainees?

- YES
 - If YES, please provide further detail:
- NO

For the following statements, please indicate your level of agreement:

7. Competence in code status discussion with cancer patients is important for trainees in my program.

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Competence in code status discussion with cancer patients is important for clinical practice in my field of Oncology.

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Do you expect trainees to be fully competent in code status discussion before starting your program?

- YES
- NO

Please provide comments:

10. What barriers, if any, currently interfere with teaching code status discussion to trainees in your program? (select all that apply)

- Lack of time
- Lack of teaching resources specific to this competency (e.g. Validated communication tools, or teaching curricula)
- Lack of evaluation tools
- Limited interest among trainees
- Limited interest among staff
- Staff responsible for teaching have limited confidence in leading code status discussions
- This competency is too difficult to teach
- Other (please specify): _____

11. In your program, is there a mechanism to identify a learner with a weakness in discussing code status?

- YES
- NO

Please provide comments:

12. If you identify a learner with a weakness in this area, does your residency training program offer any mechanisms for remediation?

- YES
- NO

Please provide comments:

13. Do you see a need for new training resources to improve this area of medical education?

- YES
- NO

14. If answering YES to question 13, which types of resources would be of use in your program? (select all that apply)

- A validated communication tool to help with code status discussions
- A curriculum for an educational workshop
- An observed structured clinical exam (OSCE) including validated scenarios and marking scale
- An electronic teaching module
- Other (please specify): _____

Survey to trainees

The following survey addresses current teaching of ‘code status’ communication skills for postgraduate oncology trainees. This refers to exploration of a patient’s wishes regarding cardiopulmonary resuscitation (CPR). This does not refer to general communication skills for breaking bad news, transitioning to palliative care or leading difficult conversations with seriously-ill patients.

1. Program of training:
 - Medical oncology
 - Radiation oncology

2. Year of training
 - PGY1
 - PGY2
 - PGY3
 - PGY4
 - PGY5

3. By the end of your residency, will you have received any formal training in discussing code status with cancer patients?
 - YES
 - NO
 - Not sure

4. If you answered YES to question 3, please identify all teaching formats currently in use (check all that apply). If you answered NO to question 3, please move on to question 5.
 - Academic half day
 - Didactic lecture
 - Case-based learning
 - Role-play
 - Simulation-based learning
 - Mandatory direct observation by staff with feedback given to trainee in a clinic-based patient encounter
 - Mandatory direct observation by staff with feedback given to trainee in a hospital-based (e.g. ward or ER) patient encounter
 - Other (please specify): _____
 - Please provide further detail regarding current teaching of code status discussions:

5. Did you receive training in code status discussions before starting your current residency program?
- YES
Please provide details:

 - NO
6. How much time in total is committed to teaching code status discussion skills to trainees in your program over the course of residency? Please select one option:
- No time
 - Under 1 hour
 - 1-3 hours
 - 3-5 hours
 - More than 5 hours
 - Not sure
7. Have you received any formal evaluation of your ability to lead a code status discussion in your residency?
- YES
 - NO
 - Not sure
8. During your residency training, on average, how often do you lead a code status discussion with a cancer patient in the clinic?
- Never
 - less frequently than once per month
 - monthly
 - weekly
 - several times per week
9. During your residency training, on average, how often do you lead a code status discussion with a cancer patient in the hospital (in ER, on the ward or in the ICU)?
- Never
 - less frequently than once per month
 - monthly
 - weekly
 - several times per week

10. When you lead a code status discussion, how often does it happen during on-call coverage?

- Always
- Most often
- Sometimes
- Rarely
- This does not apply to me because I have no after-hours coverage duties

11. When you lead a code status discussion, how often do you agree with the patient's decision?

- Always
- Most often
- Sometimes
- Rarely
- Not sure

12. How often do you advise a patient which code status (e.g. Full code or DNR) is most medically-appropriate?

- Always
- Most often
- Sometimes
- Rarely
- Not sure

13. What barriers prevent you from advising a patient which code status (e.g. Full code or DNR) is most medically-appropriate? (select all that apply)

- There are no barriers
- I have trouble estimating prognosis for oncology patients
- It is difficult to make a code status recommendation the first time I meet a patient
- Accessing necessary information in the health record is difficult
- I do not want to interfere with the care plan of the oncologist
- Patients and family members are not willing to discuss code status
- It is difficult to find time to discuss code status when I am on call (after-hours coverage)
- Other (please specify): _____

For the following statements, please indicate your level of agreement:

14. I feel confident that I can lead an appropriate code status discussion with a cancer patient.

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. In my residency program, I am satisfied with the current teaching on code status discussions with cancer patients.

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. In my residency program, I would benefit from having more formal teaching on code status discussions with cancer patients.

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. When I discuss code status with a cancer patient, the conversation influences overall care.

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Competence in discussing code status is important during my residency.

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Competence in discussing code status is important for my future clinical practice.

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. What barriers currently interfere with teaching code status discussion skills to trainees in your program? (select all that apply)

- Lack of time
- Lack of teaching resources specific to this competency (e.g. Validated communication tools, or teaching curricula)
- Lack of evaluation techniques
- limited interest among trainees
- limited interest among staff
- Staff responsible for teaching lack skill in leading code status discussion
- This competency is too difficult to teach
- It is expected that I am already competent in this skill before starting my current residency program
- Other (please specify): _____

Appendix C: Rating scales

PULSES Rating Scale

Please evaluate the learner’s **competence in leading a code status discussion with a cancer patient**. Code status discussion requires exploring the patient’s wishes with respect to cardiopulmonary resuscitation (CPR).

For each of the following items, rate how well the skill was demonstrated:	Excellent/demonstrates competence (2)	Attempted, but needs improvement (1)	Not attempted (0)			
Prognosis						
Asks patient’s understanding of prognosis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Discusses the curative versus non-curative nature of current cancer treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Discusses what to expect in the future (this may include an estimate of expected survival)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Underlying values						
Explores what makes life worth living for the patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Explores the patient’s fears	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Asks about the patient’s goals or hopes for the future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Long-term outcomes of CPR						
Discusses physical trauma from resuscitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Discusses long-term impact on quality of life after a resuscitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Explains the low chance of leaving hospital after a resuscitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Short-term outcomes of CPR						
Describes CPR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Indicates that CPR is unlikely to be successful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Indicates that after successful CPR admission to the ICU is expected, or mentions the expected requirement for life support such as intubation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Educated recommendation						
Discusses alternative options other than CPR, such as comfort care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Makes a recommendation on a medically appropriate code status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Makes a recommendation based on the patient’s values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Summary and style						
Asks for understanding of the code status decision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Allows opportunity for the patient to talk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Demonstrates empathy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Total score:			/36			
Please provide a global rating of competence in this scenario:						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Very poor	Poor	Weak	Satisfactory	Good	Very good	Excellent

Communication Skills Assessment Form (CSAF) (26)

Communication Skill	Rating	
	No (0 points)	Yes (1 point)
A. General Patient-Centered Interviewing Skills		
1. Establishes rapport promptly (within first 30 seconds of encounter)		
2. Describes the purpose of the encounter during the first third of the interview (i.e. discussing general/future care)		
3. Uses summary statements to ensure understanding of patient's statements ("It sounds like...")		
4. Explicitly elicits additional questions and/or concerns		
5. Makes explicit statement of "partnership building" and/or "non-abandonment"		
6. Uses non-technical language		
	Subtotal _____	
B. Discussing Code Status	No (0 points)	Yes (1 point)
1. Asks patient about <u>prior experiences</u> with end-of-life decision-making (e.g., prior discussions)		
2. Inquires about assignment of healthcare proxy or power of attorney for healthcare (PoA); identifies specific proxy if not already done		
3. Assesses patient's understanding of his/her current condition		
4. Explores patient's understanding of the prognosis		
5. Explicitly asks about patient's concerns about the future		
6. Explores and clarifies the patient's general values and goals		
7. Discusses outcomes of attempted resuscitation (not just specific interventions)		
8. Proposes a care plan that respects patient's goals, values, and concerns (i.e., makes a recommendation regarding code status)		
9. Frames recommendation by focusing on "active" treatments first, rather than just on "withheld" treatments		
	Subtotal _____	
C. Responding to Emotion	No (0 points)	Yes (1 point)
1. Names, validates, or expresses understanding of the patient's emotional reaction		
2. Explores patient's emotional reaction(s) in greater detail		
3. Uses silence appropriately after providing information or asking a difficult question (at least 3 seconds)		
	Subtotal _____	
OVERALL TOTAL _____		

Appendix D: Findings from Pilot OSCE

Table 11 - Pilot OSCE feedback and resulting changes

Comment from participant	Change made for final OSCE
<i>Feedback from fellows</i>	
Station summaries were too long	Station summaries were shortened and simplified
To better orient the learner to the nature of the intended conversation, it was necessary to state the expected prognosis explicitly	Prognosis statements included in all station summaries
The allotted time (10 minutes) was too short to complete each encounter	12 minutes allowed for each encounter
Overall, the learners found the SPs to provide realistic performances and the simulated encounters generally covered the intended content	No change
<i>Feedback from standardized patients (SP)</i>	
SPs found it difficult to remain in character while thinking about the evaluation checklist	SPs were asked only to record comments on quality of communication from the patient's perspective rather than using a rating scale
SPs found the training inadequate to act as evaluators.	Expert raters were recruited for the study rather than relying on SPs to provide evaluations

Appendix E: Final OSCE Station Summaries

Station 1: Betty Kraus

ID: 67-year-old woman seen in the ER with dyspnea, fever and right-sided chest pain.

Cancer history: Stage 4 non-small cell lung cancer (adenocarcinoma, EGFR mutation negative and ALK translocation negative). She was diagnosed 11 months ago with metastatic disease involving brain, lungs, mediastinal lymph nodes and liver. She had whole brain radiation followed by platinum-doublet chemotherapy. She had progression of disease with metastases in ribs and a right-sided pleural effusion. She enrolled in a trial of a PD-1 inhibitor but had to stop treatment for toxicity. She had palliative radiation 1 month ago for rib pain and required a tunneled pleural catheter for worsening pleural effusion. She is now on dexamethasone and narcotic. The last oncology clinic note indicates that she will be reassessed for 3rd line therapy, but treatment is unlikely due to worsening performance status. Expected survival is 2-4 months.

Social history: She is a former house cleaner. She lives in an apartment with her elderly husband who is developing dementia and she acts as his primary caregiver.

Presentation: She presents with 3 days of severe, right-sided, pleuritic chest pain. There has been a chronic dull pain for over a month which is now much worse. Hydromorphone helps, but makes her drowsy and she is reluctant to take it. Dyspnea has been progressive over the last week and she is now having dyspnea at rest. The pleural fluid changed from straw-coloured to bloody one week ago and drainage stopped 3 days ago. She has also experienced night sweats for 2 nights. Aside from these acute symptoms, there has been deterioration in her performance status over 2 months. She is increasingly weak, spends most of the day resting and oral intake is less due to anorexia.

On exam, vitals signs include BP 95/60, HR 110, RR 22, O₂sat 91% on 3L by nasal prongs and T_m 38.5°C. Physical exam is consistent with a right-sided pleural effusion. There is erythema at the pleural drain site and some purulent discharge at the orifice. She has temporal muscle wasting and mild ankle edema bilaterally.

Abnormal labs include WBC 19, Cr 147, Na 129, Albumin 16, pH 7.21, lactate 3.0. CXR shows enlarging, loculated, right-sided pleural effusion. There are also multiple lung nodules increased in size compared to the last CXR 1 month ago. Other tests are unremarkable.

You are most worried about infection of the pleural drain and possible empyema. You intend to admit her to hospital for IV antibiotics, IV fluid and possible assessment by the thoracic surgery service.

You return to the bedside to tell Betty your plan to admit her to hospital. You are concerned that Betty could become very sick and you feel this is a necessary time to discuss advanced directives. Please carry out a code status discussion.

Station 2: Katrina Hill

ID: 58-year-old woman seen in the ER with right upper quadrant abdominal pain, jaundice and fever.

Cancer history: Stage 4 adenocarcinoma of the gastroesophageal junction (Her-2 negative) diagnosed 6 weeks ago. She has metastatic involvement of lymph nodes in the chest and abdomen. After multidisciplinary review, her cancer was deemed incurable. She proceeded with brachytherapy (internal radiation) for dysphagia symptoms which was completed 1 week ago. She is due to start palliative combination chemotherapy (ECX) next week. She was told average survival with her disease is 9-12 months.

Social history: She is a recently retired elementary school teacher. She is married, and her 3 kids are away at university. She walks 1 hour every morning then meets friends at a coffee shop. She enjoys gardening, and cooking.

Presentation: She has experienced 3 days of worsening right upper quadrant pain initially intermittent and now continuous. She has developed chills and rigors in the last 2 days. This morning she woke up with a fever of 39.0°C and noticed some change in skin colour. She feels nauseated and lethargic. She maintained normal physical activity until 3 days ago, but since then has been resting most of the day. Her dysphagia is much improved since brachytherapy and oral intake is normalizing.

On exam, vital signs include BP 105/65, HR 120, RR 18, O₂sat 97% on room air and T_m 38.7°C. She is uncomfortable and tries not to move due to pain. There is mild jaundice. She is very tender in the right upper quadrant on deep palpation, but there are no peritoneal signs. Exam is otherwise normal.

Abnormal labs include WBC 22, Bilirubin is 80 (mostly conjugated), AST 45, ALT 60, ALP 350, GGT 300. Blood cultures have been sent. CT scan shows there has been progression of lymphadenopathy in the upper abdomen compared to a baseline staging scan done 1 month ago. There is now biliary obstruction due to extrinsic compression from malignant adenopathy.

After reviewing her tests, you are worried about cholangitis. You intend to admit her to hospital for IV antibiotics, IV fluid and consultation to the general surgery service for possible ERCP or percutaneous drainage of the biliary tree. This will delay chemotherapy due to concern of sepsis.

You return to the bedside and explain the need for hospitalization. You intend to document an advanced directive on the admission orders. Please carry out a code status discussion.

Station 3: Sarah Rosen

ID: 39-year-old woman seen in the ER after 2 falls at home.

Cancer history: Stage 4 breast cancer. She was initially diagnosed with locally advanced invasive ductal carcinoma of the right breast during her second pregnancy. The tumor was triple negative (ER-, PR-, Her2-) and she was found to have a BRCA1 mutation. She had neoadjuvant chemotherapy, bilateral mastectomy and locoregional radiation which was completed 1 year ago. In the last few months she noticed change in balance and a posterior headache. MRI identified leptomeningeal disease around the cerebellum. She started high-dose dexamethasone and has been undergoing cranial irradiation for the last 2 weeks. Staging CT scan has also identified metastatic spread to the liver. After radiation, she will see her medical oncologist to discuss palliative chemotherapy options. You recall reading that expected survival with leptomeningeal disease is usually less than 3 months.

Social history: She is married. She has a degree in journalism and is currently a stay-at-home mom with children aged 5 and 2. Her mother has recently moved in to help since she got sick. She has not been able to engage in any usual activities recently.

Presentation: Sarah has been feeling increasingly weak over the last 2 months. She has developed profound exhaustion since starting the radiation treatment and her legs are weaker on the dexamethasone. She has been unsteady on her feet and falls have become frequent. She had 2 falls this morning and she was unable to get up off the bathroom floor. Her mother called an ambulance. Sarah also has thrush which has made it difficult to eat. She has been napping frequently through the day and is experiencing insomnia at night. She now spends her entire day resting on the couch, unable to read or watch TV due to poor concentration.

On exam, vitals signs are normal. She appears lethargic, but she is alert and oriented. Neurologic examination reveals ataxia and proximal muscle weakness in the legs. Cranial nerve testing is normal. The remaining exam is normal.

A full panel of bloodwork reveals normal cell counts, glucose 16, Na 130, AST 75, ALT 60. CT scan of the head shows known leptomeningeal disease in the posterior fossa, but no other intracranial abnormality.

You believe that her symptoms are explained by several factors including leptomeningeal spread of cancer, radiation toxicity, poor nutrition and dexamethasone myopathy. She is not well enough for discharge. She will need assessment by allied health professionals including OT, PT and nutrition. You will consider involving the palliative care service.

You return to the bedside and explain the need for hospitalization. You intend to document an advanced directive on the admission orders. Please carry out a code status discussion.

Appendix F: Orientation materials for standardized patients for OSCE scenarios

Station 1:

Case Title: "I am not ready to give up."

Chief Complaint/Reason for Visit:

Chest pain, fever, shortness of breath

Differential Diagnosis: (*list competing diagnostic possibilities*)

Empyema, pneumonia, pulmonary embolism

Actual Diagnosis:

Empyema from pleural drain infection

Case Author(s): Oren Levine

Date of original: August 10, 2016

Skills Involved: *(Check all that apply)*

- Physical examination *(If checked, list typical exams performed under 'Objectives')*
- Interviewing
- History taking
- Counselling
- Assessment and clinical reasoning
- Other__the main focus is on communication around code status -i.e. wishes regarding cardiopulmonary resuscitation (CPR)

Learning Objectives:

E.g. obtaining informed consent.

Address patient's wishes regarding code status by discussing 6 domains

1. Prognosis
2. Underlying values and priorities
3. Possible long-term outcomes of CPR
4. Possible short-term outcomes of CPR
5. Educated recommendation (i.e. Trainee should give a medical recommendation regarding code status decision)
6. Summarize and confirm agreement on code status wishes

Build rapport

Demonstrate empathy and non-judgmental approach

Setting: the simulated environment is an assessment room in the emergency department

Room set-up: no set up required (empty clinic space will be used)

Equipment or Props: patient will wear a gown and will have oxygen tubing

SP Name: Betty Kraus

AGE: 67

GENDER: F

BODY BUILD: ideally thin (even frail-looking if possible)

RACE/ETHNICITY: n/a

INCOMPATIBLE PATIENT CHARACTERISTICS: n/a

Social History

Marital status: married

Children: daughter Emily, son Chris

Occupation/Education: previous house cleaner

Partner's occupation: retired factory worker

Where do you live? Inner city

Who lives with you? Husband with developing dementia

Living conditions (housing)/Environment: rents apartment

Social/Socio-economic background: relies on pension and some help from children.

Support system: daughter Emily lives nearby and tries to provide meals and helps with shopping. She has a young family and is feeling overwhelmed. Son lives in another province. Neighbors have been providing transportation to appointments and walking the dog.

Spirituality: Catholic

Leisure Activities: watches TV. Tries to read to newspaper when she has the energy and concentration. Used to knit, but has not been knitting recently due to lost interest.

Expanded Case Details

Chief Complaint	Pain in chest	
History of Present Complaint	Onset	Severe pain worsening for 3 days
	Location	Right lower chest in the back
	Duration	Pain has been present for 1 month, but much worse in last 3 days.

	Timing	Pain is constant, but worse with coughing
	Character/Quality	Sharp
	Severity/Intensity/Scale	10/10
	Aggravating/Alleviating Factors	Pain is worse with cough and deep breath. Better with hydromorphone pill although this makes her drowsy and she is reluctant to take it.
	Progression	Pain is progressive over last 3 days
	Other?	Night sweats and chills for the last 2 nights; shortness of breath on exertion has been worsening over 1 week. Now short of breath at rest for 24 hours. She has a tube in the right side of her chest (pigtail drain) to drain pleural fluid over the last month. The fluid became bloody in the last week and then drainage stopped 3 days ago. She has become progressively weaker over the last 2 months, and now has no strength to get out of bed. Appetite and food intake is also minimal.
Past Medical History	<i>Cancer history: she was diagnosed with stage 4 non-small cell lung cancer 11 months ago. The cancer had spread to the brain, so she got radiation to the whole brain. They also found cancer in both lungs, and the liver so she went onto chemo (cisplatin and pemetrexed) for 6 rounds. Then they found bone metastases as well. So she tried a new immune</i>	

	<p><i>treatment (nivolumab). She got bad diarrhea and had to stop that. The metastases in her ribs got very painful so they gave more radiation last month which helped reduce pain. Around that time, they also found a large right sided pleural effusion had developed and she had to get a drain placed. A nurse comes daily to drain off fluid. She has been taking a steroid (dexamethasone) to improve energy and appetite. She will meet with her oncologist again next week and thinks there may be another chemo to try.</i></p> <p><i>Other medical history: previous smoker, quit 5 years ago. COPD for last 8 year requiring daily puffers. Previous TIAs.</i></p>	
Medications	<p><i>Spiriva daily</i> <i>Ventolin when needed</i> <i>Dexamethasone 4mg twice daily</i> <i>Hydromorph contin 3mg twice daily</i> <i>Hydromorphone 1mg for breakthrough prn</i></p>	
Other Treatments/Therapies		
Allergies	Sulfa	
Lifestyle/Wellness	Eating Habits	Mostly toast and yogurt. Occasional boost supplement.
	Exercise	None
	Sleep Habits	Trouble falling asleep at night, often waking with pain, several naps through the day
	Stress	Significant stress around finances; worries about who will take care of her husband; worries that her daughter can't handle the burden with young kids
	Caffeine Intake	None
	Smoking	Quit
	Alcohol Consumption	None
	Recreational Drug Use	No
Sexual History	Orientation	Heterosexual

	Currently sexually active?	No
	# of current partners	0
	# of prior partners	1
	Gender of partners	Male
	History of sexually transmitted infections	No
Family Medical History	Father had throat cancer. Brother died of lung cancer 6 years ago (which is what prompted her to quit smoking).	

Please note that the focus of the scenario is around a “code status” discussion. The trainee will be provided with a summary of the history, physical and investigations. There is no need to discuss the presenting symptoms unless the trainee asks for more detail.

The patient’s perspective summary will focus on ideas/feelings/expectations as they pertain to code status.

Patient’s Perspective

Ideas and thoughts: *(i.e., what the patient thinks might have caused the problem, what kind of information have they attained about their health concern, who have they previously spoken to about this health concern, what is their understanding, etc.)*

- Regarding current symptoms: Betty thinks the tube must be blocked because of the cancer in her chest. She thinks the pain is from blockage of the tube.
- Regarding her wishes for resuscitation (i.e. Code status): she thinks that she just needs to find the right chemo and that her oncologist will be able to keep her alive. She has not made any plans around end of life care. She does not really know what a hospice is but associates the word with dying. She is determined to get more treatment to fight her cancer. She’s even heard about a new pill which might work better than chemo.
- In general, she thinks that CPR is done to keep people alive. She has seen it many times on TV and believes that outcomes are usually very good.

Feelings & Concerns: *(i.e., patient’s overall emotional state in connection to current problem; what specifically are they concerned about, what fears does the patient possess, do they have any concerns in regard to their current condition and their ability to complete daily functional tasks)*

- Regarding the symptoms: she connects the change in her pain with the lack of fluid coming out of her chest drain. This is something concrete that she can accept and understand. When the drain was put in, there was rapid

improvement in breathing symptoms, so she hopes there is another ‘quick fix’.

- Regarding her wishes for resuscitation (i.e. Code status): Betty is afraid of dying. She fights to maintain a determined attitude to keep her anxiety at bay. She fears leaving her family behind knowing that her husband’s condition is worsening, and her children will be burdened with caring for him. She allows herself to live in denial because it is too difficult to face the reality that her remaining survival will be very short.
- If she is forced to think about CPR and being on life support, she can’t bear the idea of her children having to decide to ‘pull the plug’ (i.e. Withdrawal of care). She feels a terrible sense of guilt when thinking about this. She hopes that one day she will pass away peacefully in her sleep to make it easier on her family.

Expectations: *(what the patient hopes to gain from their visit with the health care professional on this visit)*

- She hopes the drain can quickly be unclogged or replaced
- She is determined to get to her appointment with her oncologist next week and expects that she will be able to start a new chemo very soon
- She does not believe that she is dying anytime soon, certainly not during this hospitalization

Instructions for Patient Portrayal

STARTING POSITION: lying in bed with oxygen

CLOTHING/GENERAL APPEARANCE: weak, exhausted, mildly breathless with speaking

OPENING STATEMENT: *I really hope you can unblock this tube in my side. I’m so uncomfortable.*

(The first thing the patient says in response to the learner’s greeting if different or more specific than chief complaint)

BEHAVIOUR, AFFECT, MANNERISMS:

(i.e., temperament, attitude, how to respond to emotional subjects and questions about patient fears, concerns and beliefs about the problems, eye contact, facial expression, etc)

- Irritable, uncomfortable
- At times starting to express anger/frustration, not excessively rude

- When starting to answer questions that pertain to her family, or what make life worth living she starts to get tearful. She is able to quickly regain composure.

PHYSICAL RESPONSES

(E.g. range of motion, areas of pain during physical assessment, sensation, weakness etc).

- n/a

MUST ASK QUESTIONS OR PROGRAMMED RESPONSES

A list of questions (if any) that the patient must ask during the encounter or any specific responses you wish the standardized patient to elicit in direct response to learner (i.e., if learner does/asks _____, then SP responds by/with _____)

Please specify if there is an appropriate time for these questions to be asked (i.e., at 4 minutes into the encounter, once the learner has mentioned the need for radiation, etc.)

- When asked about wishes around code status/CPR/life support/heroics/resuscitation/"what you want us to do if your heart stops"/etc.
 - Initial response should be – "Well, keep me alive."
 - Follow up statement should be – "I am not ready to give up."
- If asked about **prognosis** from cancer
 - Response should be: "I know I can keep fighting this. I just need to start the next treatment. I know my doctors will find the right treatment this time."
 - If asked how long she hopes to live with the cancer, she answers "I think I can have another good year or two".
- If asked about **values** or "what makes life worth living"
 - Visiting her grandkids and taking them to the park. She realizes it has been a long time since she has been able to do this. This makes her very sad.
 - Talking to her kids on the phone everyday gives her satisfaction. She feels she can still look out for them and take care of them. She does not like the idea of them taking care of her.

MAY ASK QUESTIONS

A list of questions (if any) that the patient can ask during the encounter but does not necessarily need to ask. Used at the patient's discretion. Please specify if there is an appropriate time for these questions to be asked.

- Regarding the decision on code status, she may ask
 - "do you think I could survive CPR?"; and/or
 - "what do you think I should do, doctor?"
 - **Wait until after 5-minute mark. The trainee may offer a recommendation without prompting, but these questions can be used as a prompt to elicit medical advice.**

- May ask “what is CPR” or “what does resuscitation involve”
- May ask “when will I be able to get back on chemo?”
- May ask “Doctor, are you saying I am dying?”

Station 2:

Case Title: "I am a fighter."

Chief Complaint/Reason for Visit:

Abdominal pain, fever and jaundice

Differential Diagnosis: (*list competing diagnostic possibilities*)

Cholangitis, gall stones, liver metastasis

Actual Diagnosis:

Cholangitis and biliary obstruction from metastatic lymph nodes

Case Author(s): Oren Levine

Date of original: August 10, 2016

Skills Involved: *(Check all that apply)*

- Physical examination *(If checked, list typical exams performed under 'Objectives')*
- Interviewing
- History taking
- Counselling
- Assessment and clinical reasoning
- Other__the main focus is on communication around code status -i.e. wishes regarding cardiopulmonary resuscitation (CPR)

Learning Objectives:

E.g. obtaining informed consent.

Address patient's wishes regarding code status by discussing 6 domains

7. Prognosis
8. Underlying values and priorities
9. Possible long-term outcomes of CPR
10. Possible short-term outcomes of CPR
11. Educated recommendation (i.e. Trainee should give a medical recommendation regarding code status decision)
12. Summarize and confirm agreement on code status wishes

Build rapport

Demonstrate empathy and non-judgmental approach

Setting: the simulated environment is an assessment room in the emergency department

Room set-up: no set up required (empty clinic space will be used)

Equipment or Props: patient will wear a gown

SP Name: Katrina Hill

AGE: 58

GENDER: F

BODY BUILD: n/a

RACE/ETHNICITY: n/a

INCOMPATIBLE PATIENT CHARACTERISTICS: n/a

Social History

Marital status: married

Children: 3 kids (Rose, Allison, Michael have all gone away to University)

Occupation/Education: recently retired teacher

Partner's occupation: lawyer

Where do you live? Rural community 1 hour away from tertiary care centre

Who lives with you? Husband, dog, 2 cats

Living conditions (housing)/Environment: 3-bedroom house on large rural property

Social/Socio-economic background: upper middle class

Support system: very close and supportive family. Neighbours and friends have been visiting often (almost too often).

Spirituality: secular

Leisure Activities: morning walks, meeting friends at local coffee shop, sewing, gardening, cooking

Expanded Case Details

Chief Complaint	Right upper abdominal pain	
History of Present Complaint	Onset	3 days
	Location	Right upper quadrant
	Duration	3 days
	Timing	continuous
	Character/Quality	Aching
	Severity/Intensity/Scale	6/10
	Aggravating/Alleviating Factors	None
	Progression	Gradually progressive

	Other?	Jaundice has been new in last 24h and was the reason she came to ER. Chills for 2 days and fever 38.5C this morning.
Past Medical History	<p>Cancer history: she experienced several months of progressive swallowing difficulty and weight loss. She had endoscopy which showed a tumor at the junction of the stomach and esophagus. She had scans showing that cancer had spread to the lymph nodes in the chest and abdomen. Doctors told her that the cancer could not be cured but treatment could help control and prevent symptoms. She had internal radiation to the tumor over the last month and luckily is finding it much easier to eat solid food. The weight loss has stopped. She plans to start her first chemotherapy treatment this week.</p> <p>Other medical history: Hypothyroid, GERD</p>	
Medications	Levothyroxine	
Other Treatments/Therapies	Recent internal radiation for cancer at the gastroesophageal junction	
Allergies	None	
Lifestyle/Wellness	Eating Habits	Managing several small meals through the day. Supplementing with smoothies.
	Exercise	Daily morning walks
	Sleep Habits	7 hours at night. Early riser.
	Stress	Has not yet told her parents about her cancer. She worries that her kids will move home to be with her, but doesn't want them to interrupt their studies.
	Caffeine Intake	Daily coffee
	Smoking	None
	Alcohol Consumption	Used to enjoy red wine, but none in several weeks
	Recreational Drug Use	None

Sexual History	Orientation	heterosexual
	Currently sexually active?	Yes
	# of current partners	1
	# of prior partners	2
	Gender of partners	Male
	History of sexually transmitted infections	No
Family Medical History	Brother recently diagnosed with bowel cancer.	

Please note that the focus of the scenario is around a “code status” discussion. The trainee will be provided with a summary of the history, physical and investigations. There is no need to discuss the presenting symptoms unless the trainee asks for more detail.

The patient’s perspective summary will focus on ideas/feelings/expectations as they pertain to code status.

Patient’s Perspective

Ideas and thoughts: *(i.e., what the patient thinks might have caused the problem, what kind of information have they attained about their health concern, who have they previously spoken to about this health concern, what is their understanding, etc.)*

- Regarding current symptoms: Katrina has read on the internet that jaundice comes from the liver. She wonders if the radiation has damaged her liver. She is worried that there may be a new health problem affecting her liver.
- Regarding her wishes for resuscitation (i.e. Code status): she has not considered this before.

Feelings & Concerns: *(i.e., patient’s overall emotional state in connection to current problem; what specifically are they concerned about, what fears does the patient possess, do they have any concerns in regard to their current condition and their ability to complete daily functional tasks)*

- Regarding the symptoms: she was shocked to find out about the cancer and now worries that there is some new disease causing liver damage. She has struggled to mentally prepare herself for chemo and she is not sure that she could cope with another setback. She doesn’t want anything to take away her determination to get through chemo. She sees herself as a fighter.
- Regarding her wishes for resuscitation (i.e. Code status): Katrina has been told that the cancer is not curable, but she has not yet come to terms with this. She has always led a healthy lifestyle and thinks she still has the strength and determination to ‘battle her cancer’. She is accustomed to achieving what she sets her mind to, and she has set her mind to getting

control of the cancer with chemo. She will accept anything (including CPR) that might be needed to allow her to continue the fight

- If she is forced to think about CPR and being on life support, she hates the idea of not being in control of her own body. She does not want to prolong suffering for no reason, but currently believes she is still strong and able to fight her cancer.

Expectations: *(what the patient hopes to gain from their visit with the health care professional on this visit)*

- She expects that she will need to come into hospital for more tests to assess her liver
- She hopes that this is a side effect of radiation that will settle down in a few days
- She expects to start chemo within 1 week

Instructions for Patient Portrayal

STARTING POSITION: lying in bed trying not to move to limit abdominal pain

CLOTHING/GENERAL APPEARANCE: well groomed

OPENING STATEMENT: *Don't tell me there is something wrong with my liver – that's the last thing I need right now.*

(The first thing the patient says in response to the learner's greeting if different or more specific than chief complaint)

BEHAVIOUR, AFFECT, MANNERISMS:

(i.e., temperament, attitude, how to respond to emotional subjects and questions about patient fears, concerns and beliefs about the problems, eye contact, facial expression, etc)

- Friendly, polite, warm
- When starting to discuss resuscitation, shows some surprise and becomes more reserved

PHYSICAL RESPONSES

(E.g. range of motion, areas of pain during physical assessment, sensation, weakness etc).

- Tries to stay in one position due to pain in the right abdomen

MUST ASK QUESTIONS OR PROGRAMMED RESPONSES

A list of questions (if any) that the patient must ask during the encounter or any specific responses you wish the standardized patient to elicit in direct response to learner (i.e., if learner does/asks _____, then SP responds by/with _____)

Please specify if there is an appropriate time for these questions to be asked (i.e., at 4 minutes into the encounter, once the learner has mentioned the need for radiation, etc.)

- When asked about wishes around code status/CPR/life support/heroics/resuscitation/"what you want us to do if your heart stops"/etc.
 - Initial response should be – "I am a fighter."
 - Follow up statement should be – "I still have a lot of fight left in me."
- If asked about **prognosis** from cancer
 - Response should be: "I know this can't be cured, but I am strong enough for treatment, so I think I can control this for a while."
 - If asked how long she hopes to live with the cancer, she answers "I know it might only be a year or two, but you never know what the chemo will do".
- If asked about **values** or "what makes life worth living"
 - Her family. She lives for long weekends when everyone is back at home. She usually cooks a big meal and loves having all her kids at the dinner table.
 - She would love to live to see her kids get married. Her oldest daughter is engaged and has been thinking of getting married next summer (less than 1 year away)
 - She loves her routine of morning walks and meeting friends at the coffee shop.
 - She has a nurturing spirit and loves to look out for others. She hates the idea of being a patient and relying on the care of others.

MAY ASK QUESTIONS

A list of questions (if any) that the patient can ask during the encounter but does not necessarily need to ask. Used at the patient's discretion. Please specify if there is an appropriate time for these questions to be asked.

- Regarding the decision on code status, she may ask
 - "do you think I could survive CPR?"; and/or
 - "what do you think I should do, doctor?"
 - **Wait until after 5-minute mark. The trainee may offer a recommendation without prompting, but these questions can be used as a prompt to elicit medical advice.**
- May ask "what is CPR" or "what does resuscitation involve"
- May ask "when will I be able to get on chemo?"
- May ask "Doctor, are you saying I am dying?"

Station 3:

Case Title: "I am not ready to die"

Chief Complaint/Reason for Visit:

Loss of balance, falls, weakness

Differential Diagnosis: *(list competing diagnostic possibilities)*

Leptomeningeal spread of cancer, dexamethasone-related muscle weakness, dehydration

Actual Diagnosis:

Leptomeningeal spread of cancer

Case Author(s): Oren Levine

Date of original: August 10, 2016

Skills Involved: *(Check all that apply)*

- Physical examination *(If checked, list typical exams performed under 'Objectives'.)*
- Interviewing
- History taking
- Counselling
- Assessment and clinical reasoning
- Other__the main focus is on communication around code status -i.e. wishes regarding cardiopulmonary resuscitation (CPR)

Learning Objectives:

E.g. obtaining informed consent.

Address patient's wishes regarding code status by discussing 6 domains

13. Prognosis
14. Underlying values and priorities
15. Possible long-term outcomes of CPR
16. Possible short-term outcomes of CPR
17. Educated recommendation (i.e. Trainee should give a medical recommendation regarding code status decision)
18. Summarize and confirm agreement on code status wishes

Build rapport

Demonstrate empathy and non-judgmental approach

Setting: the simulated environment is an assessment room in the emergency department

Room set-up: no set up required (empty clinic space will be used)

Equipment or Props: patient will wear a gown

SP Name: Sarah Rosen

AGE: 39

GENDER: F

BODY BUILD: n/a

RACE/ETHNICITY: n/a

INCOMPATIBLE PATIENT CHARACTERISTICS: n/a

Social History

Marital status: married

Children: 2 young kids (daughter Dana - age 5; and son Reuben - age 2)

Occupation/Education: degree in journalism, currently stay at home mom

Partner's occupation: Lawyer

Where do you live? Urban area; neighborhood with many young families

Who lives with you? Husband, 2 kids. Mother has come to stay and help since her diagnosis of recurrent cancer last month.

Living conditions (housing)/Environment: 2-bedroom house. The house is cramped with the 2 kids sharing a bedroom. An addition was planned to add an extra bedroom, but this has been put on hold due to health status.

Social/Socio-economic background: upper middle-class lifestyle

Support system: very close with her mother and sister. Has a strong relationship with her husband, but marriage has been under more strain with her mother living in the house and more responsibility falling on her husband to take care of the kids. Supportive network of friends – many also have young families.

Spirituality: Jewish. Mostly attends synagogue for the holidays, but keeps traditions in the home.

Leisure Activities: loves baking. loves to read novels but has not been able to concentrate enough to read in last few weeks. She used to take her kids to the community centre and swimming pool nearby, but has not had the strength to do this for over a month.

Expanded Case Details

Chief Complaint	2 falls at home today. Was not able to get up off the bathroom floor.	
History of Present Complaint	Onset	today
	Location	n/a
	Duration	Weakness has been progressive for several months

	Timing	n/a
	Character/Quality	n/a
	Severity/Intensity/Scale	n/a
	Aggravating/Alleviating Factors	n/a
	Progression	Worsening weakness
	Other?	Has developed a white pasty film in her mouth (thrush) in the last week. Has not been able to sleep despite worsening exhaustion.
Past Medical History	<p><i>Cancer history: During her second pregnancy she was diagnosed with a tumor in the right breast. Doctors called it locally advanced. She had chemo starting in the last trimester and then continuing after her baby was delivered. She couldn't breast feed, and this was devastating. She was found to have 'the breast cancer gene' and doctors advised her to have both breasts removed. She had the surgery and then radiation to the chest and armpit. Just over a year after her treatment was completed, she noticed some changes in her balance and an aching at the back of her head. Her oncologist got an MRI of the head and found spread of the cancer around the back of the brain (leptomeningeal spread). She started high doses steroid pills and saw her radiation doctor again. She has started radiation to the head and spine to try to stop the cancer and has had daily treatments for the last 2 weeks. A CT scan of her body has also shown cancer growing in the liver. She has been told that this cannot be cured, but chemo might be able to slow it down.</i></p> <p><i>Other medical history: irritable bowel syndrome</i></p>	
Medications	<i>Dexamethasone</i>	
Other Treatments/Therapies	None	
Allergies	None	
Lifestyle/Wellness	Eating Habits	Eats only kosher food. Has been losing her appetite

		for several months, but it has been very hard to eat in the last week due to the thrush in her mouth.
	Exercise	Used to jog and swim, but has been months since she had the energy.
	Sleep Habits	The dexamethasone keeps her awake at night. She has been falling asleep often on the couch for short naps through the day. This is becoming more frequent in the last 2 weeks.
	Stress	She is very anxious about the idea of her kids growing up without a mom. She feels like she has already failed as a mother and it causes her grief that she does not have the energy to play with the kids.
	Caffeine Intake	Coffee daily
	Smoking	None
	Alcohol Consumption	Used to enjoy wine, but has not had any recently
	Recreational Drug Use	None
Sexual History	Orientation	Heterosexual
	Currently sexually active?	Yes
	# of current partners	1
	# of prior partners	2
	Gender of partners	male
	History of sexually transmitted infections	No
Family Medical History	Paternal grandmother had ovarian cancer and 2 aunts had breast cancer.	

Please note that the focus of the scenario is around a “code status” discussion. The trainee will be provided with a summary of the history, physical and investigations. There is no need to discuss the presenting symptoms unless the trainee asks for more detail.

The patient’s perspective summary will focus on ideas/feelings/expectations as they pertain to code status.

Patient’s Perspective

Ideas and thoughts: *(i.e., what the patient thinks might have caused the problem, what kind of information have they attained about their health concern, who have they previously spoken to about this health concern, what is their understanding, etc.)*

- Regarding current symptoms: Sarah feels weak and exhausted. She thinks it is partly from the radiation treatments, but thinks that the dexamethasone has prevented her from sleeping. If she could just get a good night’s sleep, she would feel a lot better, she thinks. She has been unable to eat well even though her mom keeps cooking all her favourite foods. She thinks that better nutrition would be really helpful for getting her strength back. She wonders if there is a supplement that would help.
- Regarding her wishes for resuscitation (i.e. Code status): She is undecided. She knows that she will die of cancer, and she does not want to prolong suffering. She just can’t believe how fast things are happening. All she knows is that she does not feel ready to die. *Whatever* will keep her alive seems ok right now.

Feelings & Concerns: *(i.e., patient’s overall emotional state in connection to current problem; what specifically are they concerned about, what fears does the patient possess, do they have any concerns in regard to their current condition and their ability to complete daily functional tasks)*

- Regarding the symptoms: she is worried that the cancer is spreading to more places. She is afraid that she will never recover. She is afraid that she will never be able to manage at home with her family.
- Regarding her wishes for resuscitation (i.e. Code status): She cannot start to think or talk about this without becoming tearful. She is afraid of the future. She is afraid to suffer, but she is more afraid to leave her family behind. She has a deep sense of ambivalence and anxiety.

Expectations: *(what the patient hopes to gain from their visit with the health care professional on this visit)*

- She expects to get admitted to the ward

- She hopes there are medications that can help her get some sleep and regain her strength
- She wonders whether they can even put nutrition into her IV to help her build up strength
- She does not expect that she is dying, but deep down she worries that she might be in hospital for a long time

Instructions for Patient Portrayal

STARTING POSITION: lying in bed

CLOTHING/GENERAL APPEARANCE: looking exhausted, often closing her eyes

OPENING STATEMENT: *I just wish I could have a good night's sleep. I just need to rest. (The first thing the patient says in response to the learner's greeting if different or more specific than chief complaint)*

BEHAVIOUR, AFFECT, MANNERISMS:

(i.e., temperament, attitude, how to respond to emotional subjects and questions about patient fears, concerns and beliefs about the problems, eye contact, facial expression, etc)

- Tearful, but not breaking down
- Profoundly sad
- Showing signs of exhaustion

PHYSICAL RESPONSES

(E.g. range of motion, areas of pain during physical assessment, sensation, weakness etc).

- n/a

MUST ASK QUESTIONS OR PROGRAMMED RESPONSES

A list of questions (if any) that the patient must ask during the encounter or any specific responses you wish the standardized patient to elicit in direct response to learner (i.e., if learner does/asks _____, then SP responds by/with _____)

Please specify if there is an appropriate time for these questions to be asked (i.e., at 4 minutes into the encounter, once the learner has mentioned the need for radiation, etc.)

- When asked about wishes around code status/CPR/life support/heroics/resuscitation/"what you want us to do if your heart stops"/etc.
 - Initial response should be – "I am not ready to die."
 - Follow up statement should be – "I have to think of my kids. How can they be without a mother?"
- If asked about **prognosis** from cancer

- Response should be: “I know they cannot cure me. But there is treatment. Maybe chemo will slow this down. I just need more time. I am not ready to go.”
- She has heard that some people can live with stage 4 breast cancer for years
- She would like to see her kids grow up if she can hold on long enough
- If asked about **values** or “what makes life worth living”
 - She says “Being a mom. Raising my kids.”

MAY ASK QUESTIONS

A list of questions (if any) that the patient can ask during the encounter but does not necessarily need to ask. Used at the patient’s discretion. Please specify if there is an appropriate time for these questions to be asked.

- Regarding the decision on code status, she may ask
 - “Could I survive CPR?”; and/or
 - “what do you think I should do, doctor?”
 - **Wait until after 5-minute mark. The trainee may offer a recommendation without prompting, but these questions can be used as a prompt to elicit medical advice.**
- May ask “what is CPR” or “what does resuscitation involve”
- May ask “Doctor, are you saying I am dying?”

Appendix G: Questionnaires for PULSES study

PULSES Questionnaire #1: Participant demographics and baseline confidence

1. Study ID# _____
2. Please indicate your program of training:
 - a. Medical oncology
 - b. Radiation oncology
3. Please indicate your year of training:
 - a. PGY1
 - b. PGY2
 - c. PGY3
 - d. PGY4
 - e. PGY5
4. Please indicate your age _____
5. Please list any postgraduate medical training completed before your current residency program
6. Please indicate you level of confidence discussing 'code status' (wishes regarding cardiopulmonary resuscitation) with cancer patients.

1 I am not confident at all	2 I have little confidence	3 I am somewhat confident	4 I am mostly confident	5 I am very confident
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Comments:

PULSES: Post workshop questionnaire #2 (immediate feedback)

Study ID# _____

Please indicate your level of confidence discussing 'code status' (wishes regarding cardiopulmonary resuscitation) with cancer patients.

1 I am not confident at all	2 I have little confidence	3 I am somewhat confident	4 I am mostly confident	5 I am very confident
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Comments:

Please indicate whether you agree with the following statements:

1. **The teaching format was enjoyable.**

1 Strongly disagree	2 disagree	3 Neither agree nor disagree	4 agree	5 Strongly agree
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Comments:

2. **The presentation was clear.**

1 Strongly disagree	2 disagree	3 Neither agree nor disagree	4 agree	5 Strongly agree
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Comments:

3. **The content of the session was useful.**

1 Strongly disagree	2 disagree	3 Neither agree nor disagree	4 agree	5 Strongly agree
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Comments:

4. **I will be able to apply the content of the session to my clinical work.**

1 Strongly disagree	2 disagree	3 Neither agree nor disagree	4 agree	5 Strongly agree
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Comments:

5. **I would recommend this session to other oncology trainees.**

1 Strongly disagree	2 disagree	3 Neither agree nor disagree	4 agree	5 Strongly agree
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Comments:

6. **Overall the PULSES workshop was effective in helping me develop communication skills.**

1 Strongly disagree	2 disagree	3 Neither agree nor disagree	4 agree	5 Strongly agree
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Comments:

PULSES: Post workshop questionnaire #3 (delayed feedback)

Please answer the follow questions regarding your experiences since completing the PULSES program 3 months ago.

1. Please indicate your program of training:
 - a. Medical oncology
 - b. Radiation oncology

2. Please indicate your year of training:
 - a. PGY1
 - b. PGY2
 - c. PGY3
 - d. PGY4
 - e. PGY5

3. In the last three months, please indicate how often you have discussed code status (wishes regarding cardiopulmonary resuscitation) with a cancer patient
 - a. Never
 - b. Once
 - c. 1-5 times
 - d. 5-10 times
 - e. More than 10 times

4. In the last three months, how often have you used the PULSES framework to discuss code status with a cancer patient?
 - a. I have not discussed code status in the last 3 months
 - b. Never
 - c. Sometimes
 - d. Often
 - e. Always

5. In the last 3 months, has the PULSES framework helped you communicate with patients about code status?
 - a. Yes
 - b. No
 - c. I am not sure

6. Has the PULSES framework helped you to feel more confident when discussing code status with a cancer patient?
 - a. Yes
 - b. No
 - c. I am not sure

Please provide further comments if possible regarding why the PULSES framework was helpful or not helpful to you in clinical encounters:

Please indicate if you agree with the following statements:

7. **I would recommend the PULSES training session to other oncology residents.**

1 Strongly disagree	2 disagree	3 Neither agree nor disagree	4 agree	5 Strongly agree
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Comments:

8. **Overall the PULSES workshop was effective in helping me develop communication skills.**

1 Strongly disagree	2 disagree	3 Neither agree nor disagree	4 agree	5 Strongly agree
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Comments: