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# Dying Well: Improving End-of-Life for Those Affected by Life-Limiting Illness

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Dying Well: Improving End-of-Life for Those Affected by Life-Limiting Illness


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## Executive Summary

According to the 2019 Rockwall County Community Needs Assessments, conducted by the two acute care hospitals that serve the county, Rockwall County offers limited access to primary care providers.  Additionally, 60% of Rockwall County residents are 60 years old and over and 81% of residents 60 years and older report a history one chronic illness at admission to acute care (Baylor Scott & White Health, 2019; Texas Health Resources, 2019).  As healthcare improves life expectancy the number of adults 65 years and older living with one or more chronic diseases has also increased.  According to the United States Department of Health and Human Services (2020) in the next 40 years, nearly one-quarter of the United States population will be age 65 or older.

Healthcare at End-of-life (EoL) in the older adult with a life-limiting illness is often crisis-driven, incongruent with patient and family preferences, and futile.  Advance care planning (ACP) is an effective means of aligning EoL goals of care to values and preferences.  ACP near EoL in the United States healthcare system is frequently under-utilized and fragmented.  In a cross-sectional survey of 193 medical oncology patients, Waller et al. (2019) found 11% of patients surveyed had discussed ACP with their physician provider.  The majority, 70% of these patients, reported they valued the importance of ACP communication with their providers.

ACP has also been shown to reduce futile resource utilization and cost of care at EoL and is supported by legislative policy and federal programs. ACP is supported by national policy through the Patient Self-Determination ACT of 1990.  Centers for Medicare and Medicaid Services (CMS) under the Medicare Physician Fee Schedule (PFS) and Hospital Outpatient Prospective Payment System (OPPS) support ACP through federal funding of provider reimbursement for ACP services.

Without timely communication and education regarding EoL care options patients and their families are susceptible to spending their last days consumed by ineffective and potentially painful treatments.  Alignment of goals of care with patient and family preferences has been shown to reduce crisis-driven care and caregiver distress, supports appropriate resource utilization and reduces healthcare costs at EoL (Abernethy, 2013; Health Quality Ontario, 2014; Houben, 2014; MacKenzie, 2018; Nevis, 2014).  Guided by the ethical principles of beneficence, non-maleficence, and preservation of autotomy healthcare providers are obligated to apply ACP best-practices and clinical experience in an environment of shared decision-making to improve patient outcomes and preserve resources.

**Rational**

As an intensive care unit (ICU) nurse who has served in the ICU departments of both hospitals that serve Rockwall County, there is a noticeably significant portion of ICU admissions in the 65 years and over demographic.  Patients in the 65 years and older demographic admitted to the ICUs in Rockwall County typically present with one or more uncontrolled chronic illnesses, unknown code status, often ack advance directives and an appointed surrogate for healthcare decision making.  As a consequence of multiple chronic illnesses compounded by frailty and lack of ACP, these patients are at higher risk of poor symptom management at EoL, poor quality of life at EoL, and receiving EoL care that is futile and not aligned with their preferences and values.  Surrogates and caregivers of these patients are at risk for distress related to unknown patient preferences for EoL care and overall satisfaction with care.  Economic loss for hospitals and society is a second-order consequence of lack of ACP in this population and stems from poor resources utilization in the form of increased crisis care, hospitalizations, and length of stay (Abernethy, 2013; Health Quality Ontario, 2014; Houben, 2014; MacKenzie,

2018; Nevis, 2014)  Nursing staff, within both ICU, have expressed concern about the frequency with which this patient population is admitted to the ICU with unknown code status and lack of advance directive (AD).  Nurses also report delays in communication in attempts to update code status and obtain AD documentation due to patient's inability to communicate, patients lacking surrogate decision-maker, and surrogate decision-maker unaware of patient EoL wishes.

Conducting an evidence-based project to capture this population at time of ICU admission will provide an opportunity for coordinated multidisciplinary ACP education and planning with patients and their surrogates. This intervention may improve patient quality of life, promote care that aligns with their preferences and values, and reduce surrogate and caregiver distress at EoL. A secondary consequence of  ACP in this population may mitigate economic losses for hospitals by reduced crisis care, hospitalizations, and length of stay, and improved benchmarking data for mortality and readmission rates.

## Literature Synthesis

The literature search included query from the following databases: Cochrane Library, Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, PubMed, and PsycINFO.  Keywords used for database query included: *advance care planning*, *chronic illness*, *education*, *elderly*, *end-of-life*, *general practitioner, length of stay, life-limiting, nurse practitioner, older adult, outcome, palliative care, primary care, provider, resource utilization*, *teaching*, and *terminal-illness.*  Inclusion criteria utilized: adult, English-language, human, and studies published between 2005-2020. Exclusion criteria utilized: adolescent, children, and pediatric.

Abernethy et al. (2013) was a 2x2x2 factorial cluster randomized clinical trial (RCT). There were 461 participants with cancer diagnosis, 50% male, and mean age of 71 years.

Participant's mean survival was 179 days, participants required some assistance with daily activities, and had pain control needs in the last three months.  The study aimed to determine impact of multiple ACP models concurrently. This study revealed reduced hospitalizations and improvement in participant's daily activities was associated with a nurse organized case conference care model in which patients and caregivers established needs priority for review. Enabling patients and their informal caregivers in a structured way improves daily functioning and reduces hospitalizations.

Health Quality Ontario (2014) was a systematic review with a meta-analysis of 12 studies. The studies included 10 RCTs and two systematic reviews. This study aimed to determine which team-based EoL care delivery model was correlated with the highest levels of patient, family and provider satisfaction. This study also considered the impact of care models on healthcare delivery system, for example, ED visits, hospital admission, ICU admission, and hospital length of stay (LOS). This study found coordinated interdisciplinary palliative care at EoL was associated with improved patient quality of life and symptom management and improved caregiver satisfaction.  Additionally, this study found patients were more likely to die at home under this model of care.  Providing a structured interdisciplinary approach to EoL care improves symptom management and quality of life for patients and caregivers of patients are better supported.

Houben et al. (2014) was a systematic review with a meta-analysis of 56 RCTs that examined impact of  AD completion and provider-patient discussion concerning ACP on EoL patient outcomes.  This study aimed to evaluate impact of various ACP interventions on adult populations. This systematic review found non-specific ACP strategies such as provider AD and EoL discussions with patients were associated with increased rates of AD documentation and

alignment of patient EoL preferences at EoL.  Facilitating ACP communication with patients improves AD completion and alignment of patient EoL preferences with realized EoL outcomes.

MacKenzie et al. (2018) was a systematic review with a narrative of 16 studies that included nine RCTs, six observational studies, and one pretest-posttest study. This systematic review aimed to show how the Respecting Choices ACP model, that normalizes ACP discussions, compared to patient-centered and disease-specific ACP models of care with respect to EoL and ACP outcomes across various settings and populations.  This study found the Respecting Choices ACP model was associated with improved alignment of patient-surrogate EoL decision making in hypothetical situations.  Additionally, the Respecting Choices ACP model was found to be associated with improved documentation of AD and tracking of the AD document.  ACP communication with patients and their caregivers improves caregiver understanding of patient EoL wishes, rates of AD completion and ability to track AD documents.

Nevis (2014) was a systematic review of six RCTs with meta-analysis. This study showed improvement in patient EoL symptoms and informal caregiver quality of life at patient EoL.  These improvements were associated with various types of education targeted at PCPs, patients, and informal caregivers of patients.  This study aimed to determine if ACP education of provider, patients, or informal caregivers done near EoL impacted outcomes for patients and their informal caregivers.  The study found ACP education of providers and informal caregivers improved patient symptoms at EoL.  Additionally, ACP education of patient and informal caregivers was associated with improved informal caregiver quality of life.  ACP education for providers, patients, and informal caregivers improves symptom management and quality of life for patients.

**Project Stakeholders**

Interdisciplinary healthcare team members, patients, and their surrogates and caregivers are stakeholders identified in this evidence-based project.  Embracing and incorporating involvement of these stakeholders from project development to dissemination of results provides an opportunity to better understand and incorporate multiple perspectives along the way. Appreciative inquiry, perspective-taking, and reflecting on various stakeholder perspectives demonstrates respect, gives space for others to address their concerns, and provides opportunities for improved understanding. (Melnyk & Fineout-Overholt, 2015).

Stakeholders identified for this evidence-based practice change include overarching stakeholders, front-line stakeholders, and supportive stakeholders. Overarching stakeholders provide administrative and financial support include hospital board members and senior-level hospital administrators.  Front-line stakeholders include physicians, unit managers, unit nurses, case managers, and chaplains.  Supportive stakeholders include patients and their surrogate decision-makers and informal caregivers, hospital nurse educators, external ACP program expert mentors, and hospital committees.  Hospital committee supportive stakeholders include ICU Practice Council, Mortality and Code Blue Committee and the Patient and Family Experience Committee.  Blending the expertise and perspectives of a diverse group of stakeholders creates a synergic environment where the process of iterative project maturity will enrich buy-in and improve the probability of valuable outcomes

**Planned Implementation and Timetable**

This evidence-based project will initiate ACP based on a needs assessment at time of admission and as needed during daily patient rounds.  Patients who would benefit from ACP will be identified utilizing the LACE Index Scoring Tool (Appendix) (Center for Advancement of

Palliative Care [CAPC], 2019). To capture qualifying patients admitted to the ICU a LACE score will be obtained on admission and as needed during daily patient rounds in ICU.  Patients with LACE scores of 10 or greater will receive a consult with the identified physician champion.  This physician champion maintains certification in palliative care, is currently on staff,  and is currently seeing patients with ACP needs.

At time of ACP physician champion consultation, the physician will lead a goals of care discussion with the patient, the patient's informal caregiver or surrogate decision-maker.  The patient's primary nurse and any identified support staff, for example, chaplain and case management, will be present. The physician champion will notify the patient's attending physician of consultation and outcome, code status will be updated, and AD documents for patient and family to complete will be provided as needed by the primary nurse.  Documentation of the consultation and goals of care discussion will be completed in the patient's medical record by the ACP champion physician.  Follow up of AD completion and completed AD document placement in the patient's medical record will be followed by the primary nurse daily, until complete, during ICU rounds.  The ACP physician champion or covering physician will be available 24 hours a day to address ACP needs of the patient as needed.

Lewin's Change Theory Model will be used to cultivate an environment that supports change.  Lwin's concepts of unfreezing, movement toward change, and refreezing will guide the team as we enhance existing organizational culture toward embracing the change process. Rogers's Diffusion of Innovations theory will guide the collaborative change effort. Innovators and early adopters will be sought to champion change efforts.  The team will be encouraged to be proactive in communication (Bosslet et al., 2015).  In addition to recognizing the overall goal of moving from vision to creation and to sustainment the team will be encouraged to appreciate the

iterative process of evidence-based practice implementation and celebrate small successes along

the way (Dang et al., 2015, Melnyk, & Fineout-Overholt, 2015; RNAO & St. Elizabeth's Health

Care, 2007; White, 2021).

The steps outlined below demonstrate the process for this ACP evidence-based change

project.  The Best Practice Guideline Implementation Project Plan developed by the Registered

Nurses' Association of Ontario (RNAO) and St. Elizabeth's Health Care paired with the Iowa

Model of Evidence-Based Practice will be used as a template to guide steps of the project.  The

overarching goal of this change project is to align evidence-based practices with identified gaps

in bedside to advocate for quality outcomes.

| Steps | Function |
|---|---|
| 1. Presentation of change project to ICU Practice Council. | • Awareness development among ICU nurse stakeholders<br>• Knowledge sharing of literature review and best-practice guidelines<br>•  Ignite shared a vision and  cultivate unit level stakeholder buy-in. |
| 2. Develop project implementation team within the ICU Practice Council. Identify and secure one day shift and one night shift ICU registered nurse, from within ICU Practice Council, as change project champions. | • Identify and support innovators and early adopters<br>• Encourage and support project champions<br>• Facilitate organized approach to project implementation |

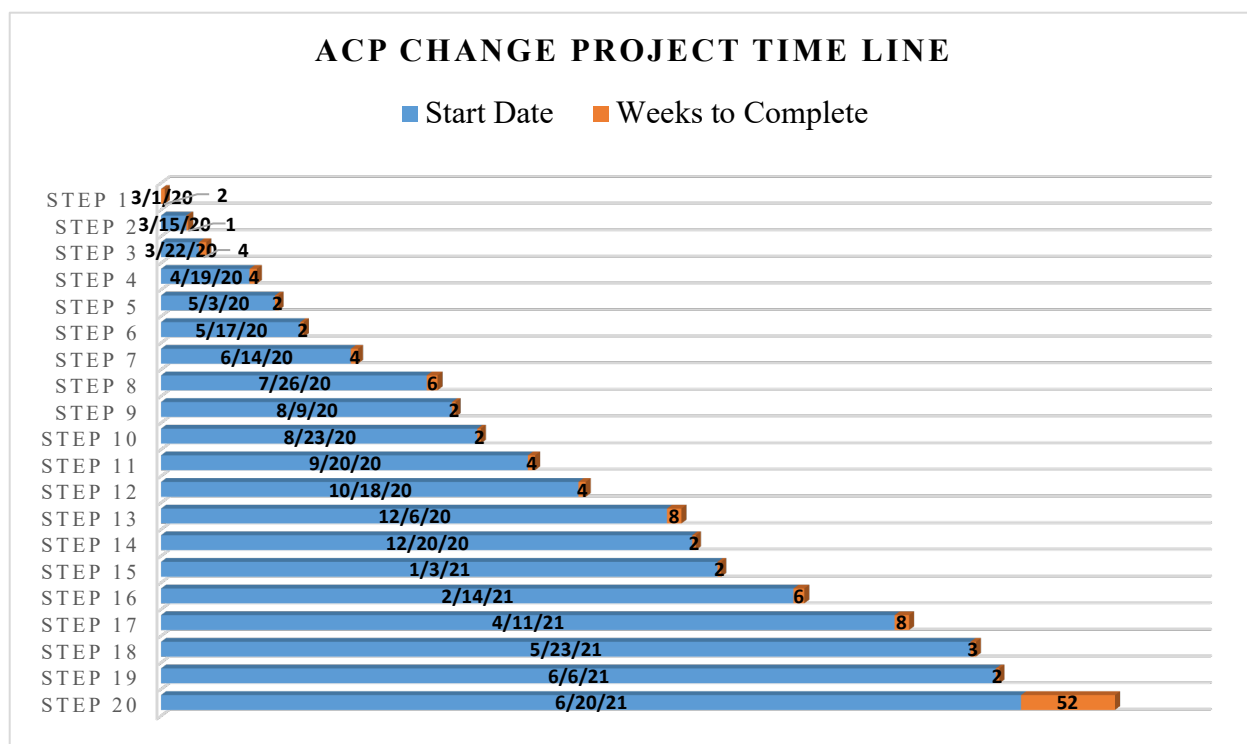| 3. Assess organizational and departmental facilitators and barriers to project and identify needs. | • Removal of barriers<br>• Leverage of facilitators |
|---|---|
| 4. ICU Practice Council to meet with ICU director, ICU physician medical director, ACP physician champion, case management director, and chaplain director stakeholders to discuss identified need, literature review and best-practice guidelines, change project idea, obtain buy-in, identify barriers and facilitators to project, and identify needs. | • Facilitates leadership buy-in<br>• Improves probability of project success through a cohesive organizational approach to change project implementation<br>• Builds trust<br>• Promotes forward movement toward a shared vision |
| 5. Identify and secure one ICU nurse champion for day shift and night shift. | • Provides contact person to disperse and receive information<br>• Promotes continuity of information<br>• Builds trust<br>• Fosters relationships |
| 6. Celebrate success at ICU department level. | • Promotes cohesiveness and strengthens team. |
| 7. Gather internal evidence based on CAPC metrics for patients 65 years and older and admitted to ICU . | • Use evidence-based metrics reinforces best practices<br>• Alignment of purpose |

| | |
|---|---|
| • Number of patients with LACE score 10 or greater.<br><br>• Shared decision-making questions Consumer Assessment of Healthcare Providers and Systems (CAHPS) supplement score<br><br>• Provider communication questions CAHPS<br><br>• LOS<br><br>    o Admission = day zero<br><br>• 30-day readmission<br><br>    o Number of patients with LACE 10 or greater who are readmitted in 30 days of discharge | • Promotes optimal patient/family outcomes and organizational success. |
| 8. Capture financial impact of change process through internal metrics based on evidence-based practice metrics in patients age 65 years or older and with LACE score 10 or greater.<br><br>• LOS<br><br>• Number of 30-day readmissions | • Use of evidence-based metrics reinforces best practices<br><br>• Alignment of purpose<br><br>• Promotes optimal patient/family outcomes<br><br>• Promotes organizational success and sustainability. |

| | |
|---|---|
| • Cost metrics of $279 per day (P= <0.001) for live patient discharges who receive interdisciplinary ACP and $347 per day (P= <0.001) for patients who die in the hospital and receive interdisciplinary ACP will be compared against internal data for usual care for same population. Cost metrics used are informed by Morrison et al. (2008) a retrospective cohort study on cost effectiveness of in-hospital palliative care and CAPC evidence-based metrics. | |
| 9. Assess need to hone PICOT question. Reassess needed resources to further move toward change based on evidence gathered. | • Provides space to realign purpose with new evidence to promote movement toward needs. |
| 10. Make recommendations to hospital administrative team and physician stakeholders, reassess organizational facilitators and barriers, identify needs, and celebrate wins | • Facilitates administrative leadership buy-in<br>• Improves probability of project success through organizational consensus and a cohesive organizational approach to change |

| | |
|---|---|
| | • Promotes trust<br><br>• Fosters relationships<br><br>• Promotes forward movement toward a shared vision |
| 11.  Update implementation process to address any new stakeholder concerns and re-organize teams as needed, identify project champions at departmental and organizational level, and continue to advocate change for project implementation. | • Facilitates organizational leadership buy-in<br><br>• Improves probability of project success through a cohesive organizational approach to change project implementation<br><br>• Promotes trust building<br><br>• Promotes forward movement toward a shared vision |
| 12.  Assess alignment of ACP tools with hospital and departmental needs. | • Provides space to realign change project purpose with existing process and tools from larger parent organization to promote movement toward identified need. |
| 13.  Assess existing organizational ACP policy and tools to determine best ACP program approach based on parent organization policy and tools and local organizational and departmental culture. | • Provides structure to change project<br><br>• Provides direction for staff involved in ACP within the ICU |

| 14. Make ACP change project process and tools recommendations to hospital administrative team and physician stakeholders, reassess organizational facilitators and barriers, identify needs, and celebrate wins. | • Facilitates a cohesive organizational approach to change project implementation<br>• Promotes trust<br>• Fosters relationships<br>• Promotes forward movement toward a shared vision |
|---|---|
| 15. Consult with stakeholders to determine, set, and announce ACP change project go-live date. | • Sets expectations for staff involved in ACP change project<br>• Promotes anticipation<br>• Promotes forward movement toward a shared vision |
| 16. Educate all ICU staff, physicians, case managers, and chaplains on practice change. | • Sets expectations<br>• Provides direction<br>• Provides support for staff involved in ACP change |
| 17. Implement pilot practice change in the ICU and track metrics. | • Puts ACP pilot change project in practice<br>• Encourages forward movement to practice change |
| 18. Measure data outcomes from practice using CAPC, CAHPS, and financial | • Use of evidence-based metrics reinforces best practices |

| metrics from Morrison et al., 2008 to capture change in ICU.  Share data with ICU staff, ICU manager, and organizational leadership. | <ul><li>Reinforces alignment of purpose</li><li>Promotes optimal patient/family outcomes, organizational success, and sustainability.</li></ul> |
|---|---|
| 19.  Share data on pilot practice change outcomes and organizational impact with stakeholders.<br><br>  • Implement change project as standard practice<br><br>or<br><br>  • Return to iterative process for development of change project | <ul><li>Reinforces or may diminish stakeholder buy-in toward continuation of ACP change project</li><li>Drives cohesive organizational approach to change project implementation or iteration</li><li>Promotes trust building</li><li>Promotes forward movement toward a shared vision</li></ul> |
| 20.  Celebrate wins and consider change project implementation in other departments (i.e. ED and inpatient units). | <ul><li>Fosters relationships</li><li>Promotes trust building</li><li>Promotes forward movement toward a shared vision</li><li>Promotes sustainability</li><li>Promotes excellence in healthcare delivery</li></ul> |

## ACP CHANGE PROJECT TIME LINE

■ Start Date  ■ Weeks to Complete

| | |
|---|---|
| STEP 1 | 3/1/20 — 2 |
| STEP 2 | 3/15/20 — 1 |
| STEP 3 | 3/22/20 — 4 |
| STEP 4 | 4/19/20  4 |
| STEP 5 | 5/3/20  2 |
| STEP 6 | 5/17/20  2 |
| STEP 7 | 6/14/20  4 |
| STEP 8 | 7/26/20  6 |
| STEP 9 | 8/9/20  2 |
| STEP 10 | 8/23/20  2 |
| STEP 11 | 9/20/20  4 |
| STEP 12 | 10/18/20  4 |
| STEP 13 | 12/6/20  8 |
| STEP 14 | 12/20/20  2 |
| STEP 15 | 1/3/21  2 |
| STEP 16 | 2/14/21  6 |
| STEP 17 | 4/11/21  8 |
| STEP 18 | 5/23/21  3 |
| STEP 19 | 6/6/21  2 |
| STEP 20 | 6/20/21  52 |

### Data Collection Methods

Data used to demonstrate gaps in current ACP care versus evidence-based practices will be based on metrics set by CAPC. These data include patient, informal caregiver, and surrogate healthcare decision-maker satisfaction metrics and cost metrics related to hospitalization. Satisfaction will be assessed through existing CAHPS survey data collected based on shared decision-making and provider communication questions.  Data used to demonstrate cost to benefit will be derived from internal assessment LOS, morbidity, and 30-day readmission rates (Gradwohl & Brant 2015; Weissman & Meier, 2009).

Project nurse champions will lead data collection and distribution.  Comparative before and after best-practice project implementation metrics and cost assessment data will be shared via dashboards with all stakeholders.  Dashboards will display this data 30 days after ACP implementation and at 30-day measurement intervals for one year.

**Evaluation**

Once the project is implemented evaluation will begin 30 days after the start will continue at 30-day intervals for one year. Evaluating project data at frequent intervals will provide an opportunity to identify unforeseen barriers and successes in near-real-time. Early identification of unforeseen barriers and success provide space and time for the team to review processes, workflow, and expectations.

Evaluation items important to the success of this project include targeted data to identify population outcomes and success of project goals. These data are specific to patient and family satisfaction, quality of care, and cost. Best-practice metrics from CAPC and CAHPS survey data will guide data selection for patient and family satisfaction and cost. Satisfaction data for evaluation will include CAHPS survey data on shared decision-making and provider communication. Quality and cost data for evaluation will include LOS, number of live hospital discharges, number of inpatient deaths, and number of 30-day readmissions. Cost savings of $279/ day for live patient discharges and $347/ day for inpatient deaths will be calculated. Satisfaction and cost data captured during ACP project implementation will be compared to usual care, under retrospective review, for the same population.

**Costs and Benefits**

The bulk of this project will be done during routine care of patients utilizing existing resources. The ACP physician champion is currently on staff and has agreed to fulfill their role in this project without additional compensation. Materials needed include paper and office supplies such as pens, pencils, markers, and highlighters that are currently available. Costs that will be added to this project are overtime hours for nursing staff to capture and analyze data and

meet with leaders and front-line staff to disseminate information monthly. Two ICU nurses currently on staff are being budgeted to fulfill this role at $49/hour. An initial estimate of four hours per week over one year for each nurse will be allotted totaling $16, 640 for nursing hours. $100/month will be budgeted for staff celebrations at each project milestone over one year this will total $1,0000. The inclusive cost for this project over one year is $17,640.

The benefits of this project significantly outweigh the cost. Current local hospital data on the average length of stay for a patient in the ICU is six days. Based on a cost savings from Morrison et al. (2008) of $279 for live patient discharges who receive interdisciplinary ACP and $347 per day for patients who die in the hospital and receive interdisciplinary ACP the cost of this project will be recouped once 68 live ACP discharges are realized. Additional cost savings from the potential of reduction in 30-day readmissions will be calculated once data is complied.

## Recommendations

Quality care at EoL is important in improving patient and caregiver experience at EOL. Structured ACP provided under a multidisciplinary model improves patient experiences and experiences at EoL. ACP also mitigates economic losses that impact current and future societal resources to provide and improve healthcare. The evidence also demonstrates the positive impact on healthcare provider communication. Based upon review and synthesis of the literature, clinical experience, and knowledge of patient and caregiver preferences and values at EoL it is recommended stakeholders consider the implementation of structured multidisciplinary ACP for patients nearing EoL.

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Appendix

**LACE Index Scoring Tool for Risk Assessment of Hospital Readmission**

**Step 1. Length of Stay**

Length of stay (including day of admission and discharge): _____ days

| Length of stay (days) | Score (circle as appropriate) |
|---|---|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4-6 | 4 |
| 7-13 | 5 |
| 14 or more | 7 |

$\Rightarrow$  **L**

**Step 2. Acuity of Admission**

Was the patient admitted to hospital via the emergency department?
If yes, enter "3" in Box A, otherwise enter "0" in Box A

**A**

**Step 3. Comorbidities**

| Condition (definitions and notes on reverse) | Score (circle as appropriate) | |
|---|---|---|
| Previous myocardial infarction | +1 | |
| Cerebrovascular disease | +1 | |
| Peripheral vascular disease | +1 | If the TOTAL score is between 0 and 3 enter the score into Box C. If the score is 4 or higher, enter 5 into Box C |
| Diabetes without complications | +1 | |
| Congestive heart failure | +2 | |
| Diabetes with end organ damage | +2 | |
| Chronic pulmonary disease | +2 | |
| Mild liver or renal disease | +2 | |
| Any tumor (including lymphoma or leukemia) | +2 | |
| Dementia | +3 | |
| Connective tissue disease | +3 | |
| AIDS | +4 | |
| Moderate or severe liver or renal disease | +4 | |
| Metastatic solid tumor | +6 | **C** |
| **TOTAL** | | |

**Step 4. Emergency department visits**

How many times has the patient visited an emergency department in the six months prior to admission (not including the emergency department visit immediately preceding the current admission)? _____
Enter this number or 4 (whichever is smaller) in Box E

**E**

Add numbers in Box L, Box A, Box C, Box E to generate LACE score and enter into box below.

**LACE**

**LACE   Score Risk of Readmission: ≥ 10 High Risk**

| Condition | Definition and/or notes |
|---|---|
| Previous myocardial infarction | Any previous definite or probable myocardial infarction |
| Cerebrovascular disease | Any previous stroke or transient ischemic attack (TIA) |
| Peripheral vascular disease | Intermittent claudication, previous surgery or stenting, gangrene or acute ischemia, untreated abdominal or thoracic aortic aneurysm |
| Diabetes without microvascular complications | No retinopathy, nephropathy or neuropathy |
| Congestive heart failure | Any patient with symptomatic CHF whose symptoms have responded to appropriate medications |
| Diabetes with end organ damage | Diabetes with retinopathy, nephropathy or neuropathy |
| Chronic pulmonary disease | ?? |
| Mild liver or renal disease | Cirrhosis but no portal hypertension (i.e., no varices, no ascites) OR chronic hepatitis Chronic Renal Disease |
| Any tumor (including lymphoma or leukemia) | Solid tumors must have been treated within the last 5 years; includes chronic lymphocytic leukemia (CLL) and polycythemia vera (PV)_ |
| Dementia | Any cognitive deficit?? |
| Connective tissue disease | Systemic lupus erythematosus (SLE), polymyositis, mixed connective tissue disease, moderate to severe rheumatoid arthritis, and polymyalgia rheumatica |
| AIDS | AIDS-defining opportunistic infection or CD4 < 200 |
| Moderate or severe liver or renal disease | Cirrhosis with portal hypertension (e.g., ascites or variceal bleeding) Endstage Renal Disease, Hemodialysis or Peritoneal Dialysis |
| Metastatic solid tumor | Any metastatic tumour |