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Objectives

- Describe the general process used to develop and implement an EHR-based mortality risk stratification model.
- Assess the impact and implications of implementation an EHR-based mortality risk stratification model on clinical, quality, and financial metrics.

Background. The frequency and timing of palliative care consultation is highly variable among inpatients with life-limiting illnesses despite evidence of its benefits.

Objectives. To develop an EHR-based risk stratification model and evaluate its impact as a trigger for inpatient palliative care consultation.

Methods. We performed a retrospective cohort study at three urban hospitals among 65,045 admissions in 2016. Using a randomly split sample and a machine learning approach, we developed and validated an EHR-based model (Palliative Connect) to predict risk of death within six months of admission. We then determined a risk threshold of $\geq$30% based on expert chart review and prospectively piloted Palliative Connect in a 4-month pre-post study of triggered palliative care consultation on a general medicine service at a large academic hospital. Primary clinicians could decline the consult. We performed an intention-to-treat analysis to evaluate impact on care delivery, quality metrics, and costs.

Results. The final prediction model had excellent discrimination (c-statistic 0.84, 95% CI 0.83-0.86). There were no differences in demographics between the pre- ($n=142$) and post-intervention ($n=134$) cohorts, with a mean age of 72 years (SD 12.9) and mean risk score of 0.50 (SD 0.16). One in three triggered consults were declined by the primary clinician. In the post-intervention period, there were increased consult orders (63.4% vs 16.2%, $p<0.001$) and advance care planning notes (26.9% vs 16.9%, $p=0.04$) in the EHR, and the pre-consult length of stay was lower (1.6 days vs. 2.8, $p=0.04$). Rates of ICU admission, hospital mortality, and 30-day readmission, and mean direct hospital costs were lower post-intervention, and hospice discharges increased, although not statistically significantly.

Conclusion. The Palliative Connect model accurately identifies inpatients with high risk of mortality who would not otherwise have received a palliative care consult and shows great promise as a trigger for consultation to improve outcomes.

Implications for Research, Policy, or Practice. Innovative predictive analytics may increase palliative care penetration and improve outcomes among patients most in need.

Specialty vs. Primary Palliative Care in Randomized Clinical Trials: A Systematic Review (FR420B)

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Objectives

- Describe the state of evidence for palliative care interventions broadly.
- Describe evidence for primary palliative care as one mechanism for potential palliative care delivery.

Background and Objective. Evidence shows specialty palliative care (SPC) improves quality of life and reduces symptom burden among seriously-ill patients, yet a shortage of SPC clinicians has prompted primary palliative care (PPC). We compared intervention content, delivery, and outcomes of SPC vs. PPC interventions tested in published RCTs.

Study Identification. We updated a 2016 systematic review of palliative care RCTs by reviewing MEDLINE, EMBASE, CINAHL, and Cochrane CENTRAL through December 2017 using National Consensus Project for Quality Palliative Care guidelines.

Data Extraction and Synthesis. Three authors classified interventions as SPC or PPC: SPC involved clinicians who were either palliative care board-certified or sub-specialty trained or had extensive clinical experience in palliative care. All other trials were considered PPC. We characterized elements of the interventions, delivery setting, and outcomes.

Results. Of 53 palliative care RCTs, 32 were SPC vs. 21 PPC. Most trials incorporated structural palliative care delivery and symptom management. A greater proportion of SPC interventions included ethical and decision-making aspects of care (13/32; 41%) compared to PPC (4/21; 19%). SPC interventions were delivered in inpatient (15/32; 47%) and/or outpatient settings (18/32; 56%) by specialty physicians (16/32; 50%) and nurses (16/32; 50%); PPC interventions were often delivered in the home (8/21; 38%) by nurses (16/21; 76%). In both SPC and PPC trials, most studies assessed psychological (respectively, n=24/32, 75%; 12/21, 57%) and physical (n=21/32, 66%; 11/21, 52%) symptom burden and patient quality-of-life (n=20/32, 63%; 10/21; 48%) outcomes, of which most favored the intervention arm.

Conclusions and Implications. There were notable differences in intervention content and delivery between SPC and PPC interventions. Both were associated with improvements in outcomes of seriously-ill patients. PPC interventions with different content and delivery mechanisms may be effective to meet some, but not all, palliative care needs of seriously-ill patients and their families.

Evaluating the Impact and Costs of Home-Based Palliative Care at the System Level (FR420C)

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Objectives

- Appreciate home-based palliative care's potential impact on patients at the end of life.
- Recognize utilization and cost benefits of home-based palliative care and apply economic evaluation to assess the value-for-money of palliative home care.

Original Research Background. While there has been increased investment in palliative care in Ontario, Canada, the evidence remains inconclusive regarding the cost-effectiveness and impact of home-based palliative care at a system level.

Research Objectives. To describe and understand the impact of home-based palliative care on place of death and healthcare cost in the last 3 months of life.

Methods. We conducted a population-based retrospective cohort study using health administrative data from Ontario's publicly funded home care program. We included adult decedents who died between April 2011 and March 2015. Regression analyses examined the relationship between receipt of home care (including service type, such as nursing), place of death (acute vs. non-acute) and healthcare cost. We calculated the incremental cost-effectiveness ratio (ICER) of palliative care, which is a measure of the added cost per unit of benefit (in this case, death diverted from an acute care facility).

Results. Decedents who received home-based palliative care in the last 3 months of life were less likely to die in acute care (OR = 0.248, p<0.001) and had lower estimated total healthcare cost (OR = 0.935, p <0.001) than those who did not receive home care services. Palliative visits by nurse practitioners demonstrated the largest effect on reducing the risk of acute care deaths (OR=0.948, p<0.001) and healthcare cost (OR= 0.982, p<0.001). Considering costs and benefits together, the ICER indicated that for every $0.25 invested in home-based palliative care, one hospital death is avoided.

Conclusion. Decedents who received home care, specifically care from palliative care nurse practitioners, were less likely to die in acute care and had lower healthcare cost.

Implications for Research, Policy, or Practice. One's dying experience could be improved by the receipt of home-based palliative supports, which require relatively minimal financial support, given the costs they offset and benefits they provide.

Same or Different? Comparing Cancer and Non-Cancer Patients Referred to Outpatient Palliative Care (FR420D)

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Objectives

- Describe key differences between cancer and non-cancer patients referred to clinic-based outpatient palliative care.
- Describe how the outpatient palliative care provided to cancer patients differs from that provided to non-cancer patients.

Original Research Background. While outpatient palliative care (PC) began primarily in cancer centers, outpatient PC increasingly serves patients with a wide range of diagnoses.

Research Objectives. Compare characteristics of patients with cancer and non-cancer diagnoses referred to clinic-based PC, and the care they receive.

Methods. Data were extracted from the Palliative Care Quality Network database regarding 3,569 patients seen by 27 clinic-based PC teams between 01/15/2016 and 07/17/2018.

Results. Overall 79.3% (n=2,766) of all patients referred to outpatient PC had cancer. Compared to patients with non-cancer diagnoses, patients with