

Palliative Care and Hospice Research Updates from 2020-2021

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Patrick White M.D. has financial interests to disclose.
Potential conflicts of interest have been resolved.

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Objectives

- Identify 10 of the most clinically relevant research studies conducted in 2020-2021
- Describe ways these studies could be applied to improve the way you deliver palliative care.
- Avoid putting you to sleep and point out shady work



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Methods

- Summarize the key scientific presentations of the year and focus only on either clinically relevant points or information for promoting palliative care
 - AAHPM “State of the Science”
 - “PC-FACS: A Year in Review”
 - “Speed Dating with Pharmacists”

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How Effective is CPR in Patients Over 80?



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CPR Resuscitation in Adults Over 80: Outcomes and the Perception of Appropriateness by Clinicians

Cardiopulmonary Resuscitation in Adults Over 80: Outcome and the Perception of Appropriateness by Clinicians

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See related editorial by Monique Anderson Starks

OBJECTIVES: To determine the prevalence of clinician perception of inappropriate cardiopulmonary resuscitation (CPR) regarding the last out-of-hospital cardiac arrest (OHCA) encountered in an adult 80 years or older and its relationship to patient outcome.

DESIGN: Subanalysis of an international multicenter cross-sectional survey (REAPPROPRIATE).

SETTING: Out-of-hospital CPR attempts registered in Europe, Israel, Japan, and the United States in adults 80 years or older.

PARTICIPANTS: A total of 611 clinicians of whom 176 (28.8%) were doctors, 123 (20.1%) were nurses, and 312 (51.1%) were emergency medical technicians/paramedics.

RESULTS AND MEASUREMENTS: The last CPR attempt among patients 80 years or older was perceived as appropriate

by 320 (52.4%) of the clinicians; 178 (29.1%) were uncertain about the appropriateness, and 113 (18.5%) perceived the CPR attempt as inappropriate. The survival to hospital discharge for the "appropriate" subgroup was 8 of 265 (3.0%), 1 of 164 (6%) in the "uncertain" subgroup, and 2 of 107 (1.9%) in the "inappropriate" subgroup ($P = .23$); 503 of 564 (89.2%) CPR attempts involved non-shockable rhythms. CPR attempts in nursing homes accounted for 124 of 590 (21.0%) of the patients and were perceived as appropriate by 44 (35.5%) of the clinicians; 45 (36.3%) were uncertain about the appropriateness; and 35 (28.2%) perceived the CPR attempt as inappropriate. The survival to hospital discharge for the nursing home patients was 0 of 107 (0%); 104 of 111 (93.7%) CPR attempts involved non-shockable rhythms.

Druwé P, Benoit DD, Monsieurs KG, Gagg J, Nakahara S, Alpert EA, van Schuppen H, Elő G, Huybrechts SA, Mpotos N, Joly LM, Xanthos T, Roessler M, Paal P, Cocchi MN, Bjershol C, Nurmi J, Salmeron PP, Owczuk R, Svavarsdóttir H, Cimpoeșu D, Raffay V, Pachys G, De Paeppe P, Piers R; REAPPROPRIATE study group. Cardiopulmonary Resuscitation in Adults Over 80: Outcome and the Perception of Appropriateness by Clinicians. *J Am Geriatr Soc.* 2020 Jan;68(1):39-45.

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CPR Resuscitation in Adults Over 80: Outcomes and the Perception of Appropriateness by Clinicians

What They Did

- Cross-sectional survey of out-of-hospital CPR attempts (not cardioversion) in Europe, Israel, Japan, and the United
- 611 clinicians were surveyed with 51% EMS, 28% physicians, and 20% nurses
- Clinicians were asked if they considered CPR appropriate or not or were unsure

Why It Matters

- 52% of resuscitations were viewed as appropriate with 29% uncertain and 19% as inappropriate
- 3% of patients in the “appropriate” group survived to hospital discharge while 1.1% of the other groups survived to discharge
- 6.6% of patients were resuscitated despite the patient have a known DNR order

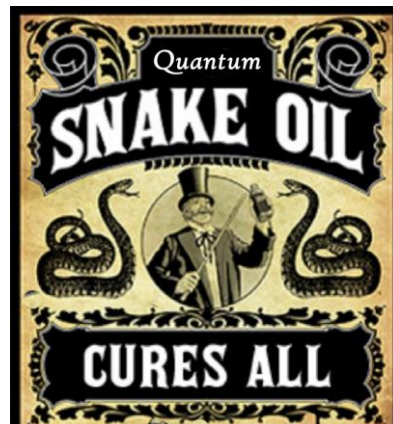
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Conclusion

- CPR has limited benefit in patients who are 80 years of age or older but despite this the majority of providers believe these resuscitation attempts are appropriate.



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Effect of Sustained-Release Morphine for Refractory Breathlessness in COPD

What They Did

- Randomized double-blind placebo controlled clinical trial
- 124 COPD patients with mMRC breathlessness grades 2-4 were randomized to 10mg of MSER BID vs placebo for 4 weeks
- Primary outcome disease-specific health status as measured by COPD Assessment Test (CAT)

Why It Matters

- Morphine is used as a palliative treatment for breathlessness in COPD patients but evidence regarding health effects and health status is scarce and conflicting
- CAT Scores were 2.18 points better in the morphine group but no difference in breathlessness
- 9% of patients in the morphine group and 2% in the control had adverse effects but no serious adverse effects in either group

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Conclusion

- Low-dose oral sustained-release morphine demonstrated improved disease-specific health status in patients without affecting PaCO₂ or causing serious adverse events

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Electrophysiological Evidence of Preserved Hearing at the End Of Life

What They Did

- Examined healthy controls and actively dying hospice patients to see if individual Event Related Potentials (ERPs) were associated with deviations in auditory tone or pattern

Why It Matters

- Palliative care and hospice providers are frequently asked if hearing is still intact but little evidence exists
- All control participants and the majority of hospice patients even hours before death demonstrated local effects or global effects to tone changes and a response to either tone or pattern changes

Conclusion

- Hearing does truly appear to be the last sense to go and the majority of hospice patients may respond to auditory tone or changes in pattern even within hours of death

Is There Anything We Can Do to Help Prevent Delirium in Hospitalized Patients



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Melatonin for Delirium Prevention in Hospitalized Patients: A Systematic Review and Meta-analysis

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Melatonin for delirium prevention in hospitalized patients: A systematic review and meta-analysis

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ARTICLE INFO

Keywords:
Delirium
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ICU delirium
Melatonin in delirium prevention
Ramelteon in delirium prevention

ABSTRACT

Background and aims: Melatonin, a pineal gland hormone is reported to have a protective effect against delirium. This systematic review and meta-analysis explores the effect of melatonin and melatonin receptor agonist, ramelteon on delirium prevention in adult hospitalized patients.
Methods: Randomized Controlled trials of melatonin/ramelteon published up to May 7, 2020 were identified from MEDLINE, PsycINFO, Embase, PsycINFO, the Cochrane Central Register of Controlled trials, PubMed, and Google Scholar. The primary outcome was delirium incidence. The secondary outcomes were sleep quality, sedation score, sedatives requirement, delirium duration, length of hospital stay, length of Intensive Care Unit (ICU) stay, mortality and adverse events. A meta-analysis with a random-effects model was performed. Estimates were presented as Risk Ratio (RR) or Mean Differences (MD) with 95% Confidence Interval (CI).
Findings: Fourteen studies with 1712 participants were included. Melatonin/ramelteon significantly reduced delirium incidence (RR 0.61, 95% CI 0.42–0.86, p 0.0005) with risk reduction of 40% in surgical patients and 34% in ICU patients. Non-significant reduction was found in medical patients. Melatonin/ramelteon were associated with improvement in sleep quality, increased sedation score and lower sedatives consumption. However, they did not reduce delirium duration, length of hospital stay, length of ICU stay and mortality. Hallucinations, nightmares and gastrointestinal disorders were prevalent in melatonin group.
Interpretation: Melatonin/ramelteon are associated with reduction in delirium incidence in hospitalized patients. However, this effect seems confined to surgical and ICU patients. The optimum dosage and formulation of melatonin, and treatment duration remains unclear and open to further studies with larger sample sizes.

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Melatonin for Delirium Prevention in Hospitalized Patients: A Systematic Review and Meta-analysis

What They Did

- They included 14 RCTs (1712 participants)
- Patients were primarily surgical and ICU patients although a few studies included medicine patients
- Primary outcome was delirium incidence and secondary outcomes were sleep quality, sedations score, sedatives requirement, delirium duration, hospital and ICU LOS

Why It Matters

- Evidence for preventing and treating delirium has been challenging to obtain with few drugs demonstrating a benefit in randomized clinical trials
- Melatonin/ramelteon significantly reduced delirium incidence RR 0.61 (CI 0.42-0.89) with risk reduction of 49% in surgical patients and 34% in ICU patients but no reduction in medical patients.
- Melatonin/ramelteon was associated with improvement in sleep quality, lower sedative consumption but did not reduce delirium duration or hospital LOS with increased hallucinations and

Conclusion

- Melatonin/ramelteon are associated with a reduction in delirium incidence in hospitalized patients however this effect seems confined to surgical and ICU patients and optimal dosing has not yet been determined

How Long Does it Take for Methylphenidate to Relieve Fatigue?




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Methylphenidate as Needed For Fatigue in Patients With Advanced Cancer: A Prospective Double-Blind and Placebo-Controlled Study

Methylphenidate as Needed for Fatigue in Patients With [Advanced Cancer. A Prospective, Double-Blind, and Placebo-Controlled Study](#) 

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Abstract

Context. Cancer-related fatigue is a highly prevalent symptom with a strong negative impact on patients' daily life.

Objectives. To evaluate the efficacy of methylphenidate as needed for the management of fatigue in patients with advanced cancer.

Methods. A prospective, controlled, double-blind, and paired design, where the patient was her and/or his own control. Patients with advanced cancer with a tiredness score of ≥ 50 on a 0–100 visual analogue scale (VAS) were included. Patients were given 10 placebo and 10 methylphenidate tablets numbered 1–20 packed in blocks of four with two active and two placebo tablets (randomly arranged). Patients taking minimum three tablets were regarded evaluable. Primary effect parameters were mean differences in VAS for tiredness after two and five hours. With 28 evaluable patients, the study had a power of 0.90 to detect a mean difference of 15 between active and placebo.

Results. Thirty-eight patients were enrolled to get 28 evaluable patients. Mean tiredness score before taking the tablets was 73 for placebo and 72 for methylphenidate on VAS (0–100). Mean changes (decrease) for methylphenidate after two and five hours were 20 and 17, respectively, and eight and five for placebo. Comparing mean differences, a significant decrease for methylphenidate compared with placebo was observed after two hours ($P = 0.001$) and five hours ($P = 0.001$), respectively.

Conclusion. In this controlled and double-blind study in patients with advanced cancer, methylphenidate as needed was significantly more effective than placebo in relieving fatigue after two and five hours. *J Pain Symptom Manage* 2020;60(5):992–1002.

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Key Words

Advanced cancer, fatigue, methylphenidate, placebo

Pedersen L, Lund L, Petersen MA, Sjogren P, Groenvold M. Methylphenidate as Needed for Fatigue in Patients With Advanced Cancer. A Prospective, Double-Blind, and Placebo-Controlled Study. *J Pain Symptom Manage*. 2020 Nov;60(5):992-1002

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Methylphenidate as Needed For Fatigue in Patients With Advanced Cancer: A Prospective Double-Blind and Placebo-Controlled Study

What They Did

- A prospective double-blind paired design where each patient acted as their own control
- 38 patients with advanced cancer were enrolled and given either placebo or 10 mg methylphenidate tablets
- Primary outcome was fatigue as listed on a patient-reported 0-100 visual analogue scale

Why It Matters

- Cancer related fatigue is one of the most prevalent symptoms impacting the majority of cancer patients at some point in their course
- Use of methylphenidate was associated with a 20 point reduction in fatigue 2 hours after taking the medication and 17 points 5 hours afterwards P= 0.004

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Conclusion

- 10 mg of prn methylphenidate has a significant impact on reducing fatigue with an onset of action within hours with low toxicity.

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How Can We Identify Sick Patients Earlier?

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Previous Triggered Palliative Care Consults in the ICU at BJH

Outcome	Intervention	Usual
Transitions to DNR	51%	23%
Trach	1%	8%
Hospice	19%	5%
ED visit/readmission	13%	28%
Ventilated days	4	6

No difference in 30-day all-cause mortality between groups!

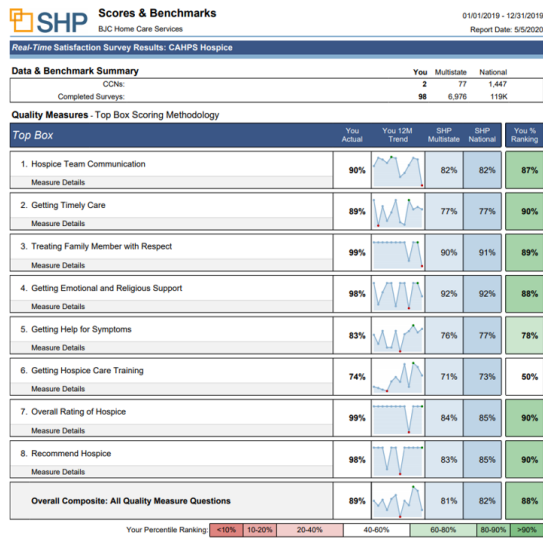
Ma J, Chi S, Buettner B, Pollard K, Muir M, Kolekar C, Al-Hammadi N, Chen L, Kollef M, Dans M. Early Palliative Care Consultation in the Medical ICU: A Cluster Randomized Crossover Trial. Crit Care Med. 2019 Dec;47(12):1707-1715.

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Patient/Family Satisfaction with Care at End-of-Life



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Using Electronic Health Records and Claims Data to Identify High-risk Patients Likely to Benefit from Palliative Care

Using Electronic Health Records and Claims Data to Identify High-risk Patients Likely to Benefit from Palliative Care

Alexia Guo, PhD; Randi Foraker, PhD, MA; Patrick White, MD, HMDC; Corey Chivers, PhD; Katherine Courtright, MD, MSHP; and Nathan Moore, MD

Although most seriously ill patients wish to avoid aggressive and burdensome care, many receive intensive procedures and therapies in the final months of their lives with limited benefit.¹⁻³ High-aggressive care near the end of life is associated with reduced quality of life for patients, excessive end-of-life medical spending, and a high proportion of patients dying in the hospital or other medical facility rather than at home.⁴⁻⁶

Palliative care is a holistic approach to care administered at any point as a response to the patient's goals and preferences, which may include symptom management and decision-making about the extent of care. A palliative care approach is associated with improved patient quality of life,^{7,8} reduced hospital readmissions,⁹ decreased hospital length of stay,¹⁰ and reduced total cost of care.¹¹ Despite multiple studies demonstrating that the majority of patients in the last year of life experience a high and escalating symptom burden and considerable need for support with advanced care planning,¹² providers and health care systems have struggled to proactively identify and support these high-risk patients and their families.¹³⁻¹⁵

Improving the use of palliative care has been identified as a key driver of success for value-based reimbursement models such as accountable care organizations (ACOs), Medicare Advantage plans, and capitated insurance plans.¹⁶⁻¹⁸ One study of managed care patients provided with better palliative care support found a mean savings of \$300 per member per month in the last 18 months of life consistent with propensity-matched controls, with hospice participation increasing from 21% to 70% and median hospice length of stay increasing from 14 to 14 days.¹⁹ Currently, the majority of patients who would benefit from palliative care services are either

ABSTRACT

OBJECTIVE: Palliative care has been demonstrated to have positive effects for patients, families, health care providers, and health systems. Early identification of patients who are likely to benefit from palliative care would increase opportunities for patients to receive the support they need. This study predicted all-cause mortality of patients as a surrogate for patients who could benefit from palliative care.

STUDY DESIGN: Claims and electronic health record (EHR) data for 52,827 patients from a large integrated health care system were utilized.

METHODS: A deep learning algorithm—a long short-term memory (LSTM) model—was compared with other machine learning models: deep neural networks, random forest, and logistic regression. We conducted prediction analyses using combined claims data and EHR data, only claims data, and only EHR data, respectively. In each case, the data were randomly split into training (80%), validation (10%), and testing (10%) data sets. The model with the highest hyperparameters were trained using the training data, and the model with the best performance on the validation data was selected as the final model. The testing data were used to provide an unbiased performance measurement of the final model.

RESULTS: In all modeling scenarios, LSTM models outperformed the other models, and the best performance was achieved when both claims and EHR data were used for feature extraction.

CONCLUSIONS: LSTM models can effectively predict mortality by using a combination of EHR data and information from claims data. The model could be used as a promising clinical tool to aid clinicians in early identification of appropriate patients for palliative care consultations.

Guo A, Foraker R, White P, Chivers C, Courtright K, Moore N. Using electronic health records and claims data to identify high-risk patients likely to benefit from palliative care. *Am J Manag Care.* 2021 Jan 1;27(1):e7-e15.

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Using Electronic Health Records and Claims Data to Identify High-risk Patients

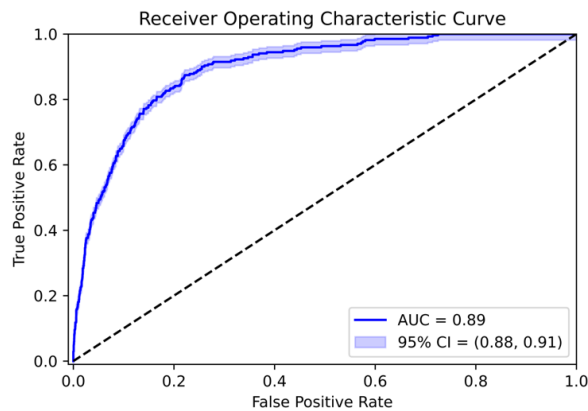
What We Did

- Claims and electronic health record data from 59,639 patients at BJC were utilized
- A machine learning algorithm (LSTM model) was embedded in the EHR
- All hospitalized patients were included 24 hours after hospital admission
- 80% of patient records were used to train the model, 10% to validate, and 10% to test

Why It Matters

- EHR only model had an accuracy of 0.95, sensitivity of 0.60, specificity of 0.98 and Precision of 0.79
- EHR and Claims data had accuracy of 0.97, sensitivity of 0.77, specificity of 0.99, and precision of 0.91

High Risk Patient Identification Targeted Goals of Care (TGI)



Cut-off	Accuracy	Sensitivity	Specificity	Precision
0.3	0.93	0.38	0.97	0.54

Hospital Outcomes:

- Advance care planning notes (primary outcome)
- Change in Code Status
- % ICU admission
- Hospital LOS, LOS Index
- ICU LOS, mortality, mortality index
- Hospital mortality
- 30-day readmission rate
- % Patients with hospice consult

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Epic Secure Chat Message

This patient has been identified as potentially elevated risk of mortality in the next 30 days. Would you be willing to have a goals of care discussion and document a brief goals of care discussion to support this patient? Please respond with this message with a, b, c or d.

- a. Yes
- b. I would prefer to have the palliative care team address and document goals of care on this patient
- c. I have already addressed goals of care with this patient/family
- d. I decline to either address goals of care and do not want the palliative care team to address



12:02 PM

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BJH TGI Preliminary Results Patients

	Results
Hospitalist responded to message	96%
Hospitalist addressed goals themselves	72%
Palliative care team consulted	22%
Declined to address goals or consult	16%
Documented ACP Note Actually Entered	61%

20-25% of all patients change code status with a TGI Prompt!

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Conclusion

- This study demonstrated an innovative, efficient, and accurate technique for identifying patients at high 30-day mortal.



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Best Study 2020-2021



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EVERY VOTE COUNTS



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